European Distance and E-Learning Network (EDEN) Conference Proceedings

EDEN 2005 ANNUAL CONFERENCE

Lifelong E-Learning

Bringing E-Learning Close to Lifelong Learning and Working Life A New Period of Uptake

Proceedings of the EDEN 2005 Annual Conference

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E-Learning and Lifelong Learning – Hand in Hand

Lifelong learning is high on the agenda in Europe: having enjoyed a continuously developing policy profile, it is now the key term for the new generation of integrated educational and training programmes of the European Union in 2007-2013. Information and Communication Technologies represent in the programme an important transversal strand, crossing all educational sectors.

Bringing e-learning closer to lifelong learning is certainly very relevant today. Education systems are seriously facing the modernisation challenge as a result of the Lisbon process. The importance of flexible delivery modes and institutions is increasing, the scenario is changing on all levels. Lifelong learning obviously implies intensive interaction between the world of work and the different educational sectors. Adult and lifelong learning represent a more and more essential part of the portfolio of traditional educational institutions. Higher education is specially positioned for producing and disseminating knowledge, but also acting as an important interlocuteur in raising awareness and promoting the culture of learning. E-learning, in the meantime, may well act as catalyst of cross-sectoral collaboration in lifelong learning activities.

The integration of ICTs in the different sectors of education, in a diversity of learning environments, approaches and solutions is an intensive ongoing process, accompanied by progressive consolidation and mainstream positioning of the e-learning field. Professionalisation of methodologies and management plays an important role: with the increasing understanding and realisation of advanced concepts of learning and teaching and the proper use of technologies, e-learning is better positioned to receive new important assignments from the society than ever before.

All the above aspects emerge in an integrated context and make up a good basis to improve significantly the uptake of modern educational methods. Improving e-learning services and products permit institutions to elaborate and implement well-founded strategies and new partnerships with the corporate sector. Academic knowledge and professional experience accumulated in the field of open, distance and e-learning should be highlighted with all its complexity and achievement in this important period.

The theme of the EDEN Annual Conference in 2005: *Lifelong e-learning* is a uniquely adequate combination of the most relevant current keywords in the educational world. The conference venue and the host institution of the event are also emblematic. The Finnish economy is one of the best examples worldwide in realizing development and modernisation, in organic synergy with science and education. Dipoli and Espoo, with the campus of the Helsinki University of Technology and the Otaniemi Science and Technology Park is a representative environment for a future oriented gathering of educational experts.

The above messages of the conference were well understood: the event enjoyed an exceptional interest from all Europe and even beyond. EDEN, continuing its successful series of conferences, welcomes the European community of educational professionals to discover the state of art, innovative practice and future scenarios for the European agenda of lifelong e-learning.

The Editors

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E-LEARNING AND THE FUTURE OF DISTANCE EDUCATION IN THE MARKETS OF THE 21ST CENTURY

Ormond Simpson, Open University, United Kingdom

Abstract

This paper will argue that the future of distance education will be decided at least as much by economic factors as by technical ones. Distance Education will need to demonstrate that it is a good solution to the education needs of students facing the labour market in the 21st century. The paper explores the economic concepts of 'return on investment', 'willing to pay', 'resale value of an education' and 'investment risk' as they apply to distance education. Above all it will argue that distance education both as it stands today and in terms of current trends towards e-learning, may be too risky an investment for most potential students, and that distance education will fail to reach its potential unless it can increase its rate of student success and market penetration.

Introduction

Anyone embarking on any kind of study of distance education that involves economics even if in an elementary sense as in this paper must immediately acknowledge the seminal work of Rumble (1997) and Hulsmann (2000) even if they do not always agree on detail.

Their work remains important because even in the rush to explore technical solutions to issues facing distance education such as e-learning, it is likely that the future of distance education will be decided as much by economic factors than technical advances. Unless distance educators can persuade governments and potential students that distance education is a sound investment then ultimately it will remain a minority activity. Whilst distance educators may argue about the relative merits of various Virtual Learning Environments or the role of e-learning in developing digital cultures, in the end whether a government or student invests in distance education will depend largely on the oldest question of all – is it value for money?

Both Rumble and Hulsman agree that distance education is cheaper in terms of the production of graduates than conventional education. But as Rumble (2001) in discussing e-learning and quoting Franklin notes "Whenever someone talks to you about the benefits and costs of a particular project, do not ask 'What benefits and costs?' ask '*Whose* benefits and *whose* costs?'". In other words ultimately it is the student who pays either as an investor or as a tax payer and it is critically important to take their perspective and ask what the benefits and costs are to them.

In order to answer the cost-benefits question it is necessary to explore economic concepts such as 'return on investment', the 'willing to pay factor', 'resale value of qualifications' and, above all, 'investment risk'.

Return on investment

The widening of participation in higher education means that increasingly students have to pick up more and more of the direct cost of their education upfront. This is true not only in the UK where tuition fees of £3000 a year will be introduced in 2006 but in countries where higher education has traditionally been free to the student. Whilst many students will continue to enter higher education whatever the costs there will be increasing numbers who will need to look at the money they will need to find up front to fund their studies and compare it with how much they will get back in increased earnings over their lifetime as a result of gaining the qualification from those studies. This is the return that they will get on that investment defined as the ratio of their increased income to the initial money invested expressed a percentage.

Because of the importance of this calculation considerable research has been conducted into the cost benefits of conventional fulltime education. For example both Walker *et al.* (2003) and Grugulis (2003) found that in the UK conventional graduates benefited financially from their education although the benefit depended on the subject of their degree. Much less work has been conducted in the distance education equivalent. However Woodley *et al.* (2001) found that on average UKOU graduates increased their earnings over the remainder of their working life times by around 15%. This does not sound a large benefit but distance education has two important advantages over conventional higher education:

- Upfront fees generally tend to be lower. For example the total cost of a UKOU degree may be of the order of £2500 (€4000) depending on the courses chosen. The total cost of a conventional UK undergraduate degree from 2006 will be at least £12,000 (€19,000).
- Distance education students can and generally do continue to earn whilst studying. This is a very important financial factor. Conventional students in the UK can endure anything up to £20,000 (€32,000) a year in lost earnings whilst studying which amounts to £60,000 (€96,000) over a three year course. This sum dwarfs the tuition fee costs.

Taken together these factors mean that a distance education student has a distinct advantage over a conventional student in financial terms. Calculations based on Woodley et al (op cit) and Walker (op cit) comparative figures suggest that distance education may have a return on investment of around 3200% (i.e. they will receive in increased income over their working life of around 32 times their original investment) compared with a return on investment for conventional graduates of 600% (Simpson, 2005). However such calculations are not only very approximate but also depend on the 'resale value' of particular qualifications.

Resale value of qualifications

Clearly many students graduating with a higher education qualification will do so in the expectation that they will be able to use that qualification to gain higher earnings. In other words the qualification will have a 'resale value' to prospective employers – the amount in salary that an employer will pay in order to take on someone with that qualification.

However not all qualifications are equal in that respect. Research in the UK for example suggests that degrees in numerate subjects in general have a higher resale value than non-numerate subjects particularly in economic fields such as business economics (that said, the highest resale values tend to be for law-related subjects). In addition some universities' qualifications (in the UK Oxford, Cambridge and a few others) tend to have higher resale values than the same subjects studied in other universities. Current figures also suggest that certain subjects have quite low resale values – art history for example where the return on investment in some individual cases can be less than 100%, although there are clearly a few public exceptions where art historians can break into the lucrative media business as television presenters.

Thus a very important factor in a prospective student's economic calculations is likely to be how valuable their qualification will be when they have obtained it. If a degree through distance education is held to be of inferior quality to a conventional degree then that will reduce its desirability and its resale value. In economic terns this will reduce a prospective student's 'willing to pay' (WTP) factor. In other words the amount a student is willing to pay for their qualification will be less if the qualification is perceived as being worth less. Indeed if the WTP is reduced to below the cost of the qualification the student will not enrol.

Risk

The final factor that may effect a student's economic decision to invest in study towards a qualification will be the risk to that investment. This in turn depends on the retention rates in whatever course or programme a student enrols. In what follows I assume that a student who enrols in a programme and fails or withdraws from that programme does not enjoy the full financial benefits that graduating from that programme would have given him or her. This is clearly not true for some students:

- Students who switch or restart studies. Some students will switch to another programme and be successful (although they will presumably lose the investment they have made into the first programme). Other students may restart their programme successfully (again losing only their initial investment).
- Students studying for enjoyment. Some students will be studying without any financial benefit in mind and may withdraw when they feel that they have gained the knowledge and skills they wanted without going forward for the final qualification (although informal surveys in the UKOU suggest that this number is only of the order of 5-10% of the total enrolment in that institution).
- Students who do not complete a full qualification but nevertheless gain some financial advantages through increased promotion prospects due to the study they have completed. It is difficult to estimate the number of such students. But an employer able to choose between fully or partly qualified students is likely to choose the former.
- Students unconcerned by economic arguments. Of course individual students are not purely guided by economic considerations when choosing when where and how to study. Nevertheless I would argue that economic considerations will become very much more important in driving student decisions in the future if not individually then in the mass.
- Students who succeed anyway. Finally it is not difficult to think of examples of students who have withdrawn from education only to go on and be hugely successful – Bill Gates who withdrew from Harvard, Albert Einstein who dropped out of high school, Mick Jagger who withdrew from university and founded a successful rock band and so on.

However if we assume that a substantial majority of the students who start courses wish to finish them then the ultimate financial advantage of distance education over conventional education become much less. This is because of one salient characteristic of distance education – its lower retention rates in both conventional and e-learning modes.

Retention in conventional distance education

It is quite difficult to get clear retention data for distance education. But taking the UKOU as an example the overall retention from start to finish over a degree course is of the order of 45% or less (UKOU IET 2004). This compares with an average retention rate in conventional UK higher education of around 80%. Thus a student 'investing' in distance education in the UK has more than twice the risk of losing his or her money as a student investing in conventional education. In fact for some students the risk attached to investing in distance education may be worse than the risk of investing in a wildcat oil drilling venture (Montie, 1999).

Consequently although the long terms return on investment in distance education may be higher than conventional education a student would be well-advised to consider the higher risk of losing their investment very carefully in choosing between them. In other words a student's 'willing to pay' investment into distance education may be considerably reduced – possibly to zero – if the risk of a nil return is seen as too high.

Retention in e-learning

If it is difficult to get clear retention data in conventional distance education then the problem of accessing retention information in e-learning is even harder. This may be due in part to the competitive nature of e-learning so that institutions may be reluctant to release data which may put them at an economic disadvantage against other players in the field. Some data is available from the US where consultants Corporate Xchange (2002) found dropout rates from e-learning of around 71%. Other data is drawn from more accidental sources such as the fact that the UKOU's 'flagship' e-learning course 'You, your computer and the Net' is also the course with the highest dropout in the University. Such random data cannot be said to add up to clear evidence of the comparative failure of e-learning and indeed there is some counter evidence that e-learning is effective at post graduate level. But for undergraduate and lower level courses the implication of the evidence is that e-learning is no more effective than conventional distance education in promoting student success and may be considerably worse.

Nevertheless if e-learning could be provided at lower cost than conventional distance education then students might be willing to accept the higher risks involved. But the cost advantages of e-learning are not clear either to students or institutions. Both Rumble and Hulsmann (op cit) agree that the full cost of an e-learning programme to an institution may well be greater than that of conventional distance education courses. In addition Bishop (2002) points out that the costs to students can be considerable in amortised computing equipment expenditure, consumables and phone charges (the costs are lower if a pc is shared or used at work. But those situations can involve other study problems). She estimates that such costs can be around £500 (€800) a year over and above course fees which, if costs are greater to institutions, will also inevitably be greater to students.

Markets for e-learning

Of course one of the drivers behind e-learning is its availability world-wide with consequent competitive advantages to successful institutions. However such globalisation will only be effective if there is some way of authenticating qualifications awarded by e-institutions. Students may have a low willing to pay value for qualifications whose resale value is doubtful because they are awarded by institutions unfamiliar to employers.

In addition the market for e-learning is more restricted than that for conventional distance education. In the UK more than 40% of the population still do not have internet access at home and although internet access is growing the rate of that growth is slowing. It is assumed by some governments that internet access can be provided through computer centres in local libraries and elsewhere. However it is not yet clear that such centres can provide suitable environments for sustained study of the kind needed to get significant qualifications such as a university degree (Driver, 2001). There is also some evidence that populations without internet access are not particularly attracted to e-learning and do not see its potential in their lives (Selwyn *et al.,* 2004).

Whilst the lack of internet access restricts the development of e-learning for distance education institutions it is a particular problem for open learning organisations who will have to find ways of reconciling e-learning with their mission to widen access to education amongst the underprivileged.

Conclusions

It is the contention of this paper that until the problem of the lower retention in distance education is tackled distance education will not compete successfully with conventional education either in terms of student recruitment or funding from government or employers. What is more this paper suggests that the signs are that current trends to move to e-learning in distance education are likely to worsen both retention and market penetration at least in the short term unless urgent action is taken to address both issues. There is evidence (Simpson, 2003) that retention in distance education can be improved through measures such as proactive student support and that such process can be cost-effective for both institutions and students. It will be vital for the future of distance education that effective student retention processes are implemented in both the conventional and e-learning environments.

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CITIZENS AS CREATORS OF KNOWLEDGE
THE EMERGENCY OF A NEW LIFELONG LEARNING PARADIGM

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Introduction

The possibility that citizens could act as knowledge creators on a large scale is an emerging trend in our societies. This tendency could have strong implications in the sense of citizenship as well as in the concept of participation in democracy. Furthermore, it could also have a visible impact on the e-learning sector, particularly in the field of lifelong learning and non-formal education.

The examples outlined in this paper basically come from articles published in www.elearningeuropa.info, the portal created by the European Commission to promote e-learning in Europe at all levels: school & higher education, learning for work and lifelong learning.

Moving towards a new paradigm

Until now, e-learning users and pupils have been considered passive receivers rather than creators of knowledge. The ‘virtual world’ has reproduced the traditional teaching model based on the hierarchy of knowledge, the tutor’s position of power and the role of the pupil as a consumer of information.

This model is beginning to change, for various reasons. These include the arrival of a large number of young people with high levels of expertise in the use of ICT, people easily capable of creating websites using complex multimedia resources.

At the same time, there are some social changes that are fostering a new structure in the information flow. According to Tony Bates, “in the industrial economic model, where you have hierarchies, a transmission model of information works very well because the information comes from the top, you do not challenge it. Particularly in a very large university you have the same hierarchy, you have professors, lecturers, researchers, students, and so the transmission model fits an industrial society” (1).

However, the industrial economic model is being transformed into a new paradigm. Moving to a knowledge-based society means new social patterns. In addition, the new communication model is basically a horizontal one. Hierarchies are not based on a top-down model, but on the acceptance of individual expertise. Such a context is encouraging the role of each individual as a creator of knowledge in a horizontal network.

This new paradigm could potentially have an important social and political dimension. The role of citizens as creators of knowledge would help to transform the net into a truly interactive space, employing a decentralised model to make greater wealth and diversity of information available. This idea may have clear implications for the concepts of citizenship, participation and democracy in Europe.

Conceptual framework

The educational dominant paradigm has evolved in recent decades. The ‘transmission metaphor’ has been substituted by the constructivism approach, and this new scenario promotes the role of citizens as creators of contents.

The current dominance of the constructivist approach has been determined by some reports. For instance, the study “New Learning Environments in School Education” carried out under the eLearning initiative and eLearning Action Plan, has identified “a shift in focus away from content and the ability to reproduce facts and knowledge towards the creation of knowledge. Pupils should be active participants in constructing knowledge through their own learning processes, both working alone or together with peers. Experimenting and exploring are important aspects of this active construction of knowledge" (2).

According to Rosa Bottino, "the prevailing metaphor is that of the system as an environment where knowledge is transmitted in order to be acquired by the user". But now learning is "progressively viewed as being based on an active exploration and personal construction, rather than on a transmisive model" (3). This conception leaves a lot of room for the activity of learners as creators of knowledge.

Since lifelong learning is currently seen as a process affecting everyone throughout their lives, and since e-learning is beginning to take off in a big way as a tool with widespread use, we are laying the foundations to encourage the creation of contents by citizens on a large scale.

Some examples

Some examples from Europe could help to illustrate the potential of citizens as content creators.

The People's War website (http://www.bbc.co.uk/dna/ww2), established by the BBC to create an archive of people's personal memories of the Second World War, received 13,000 comments and stories in the first three months of its life.

The @Brest site (http://www.a-brest.net/) was created by Brest City Council and has encouraged scores of individuals and associations to create content. In the Brest area there are some 70 websites that publish contents on a regular basis through the participation of some 300 citizens.

Futura Sciences (www.futura-sciences.com) is a website devoted to scientific dissemination. The web site is promoted by a student from the École Nationale Supérieure des Télécommunications (Paris) and one and a half million pages are read every month.

The emergency of new tools for creation

Another important aspect in this process concerns tools for creating content. Numerous examples of tools which have been created exist in Europe – often with public support – to help users develop their ideas in cyberspace. Such a case is the PHARE project (http://phares.ac-rennes.fr/_fichiers_/toutatice/docphare/Phare.htm), developed by the Académie de Rennes to provide free tools for schools to create customised intra or extranets. In Germany, the Schulen ans Netz site has developed a tool called Primolo (http://www.schulen-ans-netz.de/projekte/primolo/index.php), an easy-to-use website generator for young people. The SPIP (Système de Publication par Internet, http://www.spip.net/) is freely available from the site Uzine.net (http://www.uzine.net/) and had helped many organizations and individuals to publish information on the Internet. The free software Clic (http://clic.xtec.net/en/index.htm) has been used since 1992 for creating thousands of pedagogical activities which address different areas and educational levels. The activities have been designed by teachers on their own initiative, and can be reused freely in a library of activities in the Clic Zone.

The European Commission's view on content creation

The European Commission has recently (January 2005) published a report to summarize two consultation workshops: 'Access Rights for e-Learning Content' and 'Creating, sharing and reusing e-Learning Content'. The workshops were held in Brussels on 27 and 28 October 2004, with the participation of experts from the EU (4).

The Report states that "the process of involving content users in creation needs to be formalised and encouraged, for both individuals and groups of users. Not only does this create more and better content, it also strengthens and enriches the learning process. This is particularly true for young people, who already have the ICT skills necessary for content development."

Consequently, one of the recommendations of the Report is to "develop freely accessible web based services for citizens to access and produce content, supported by a simple interface".

Discussion: will citizens' implication in knowledge creation change e-learning?

It is too early to know how the situation will evolve and how far knowledge and content creation by users will go. The thousands of web logs arising can be regarded as an indication of the future, but everything is still in its infancy.

Anyway, the implications of content & knowledge creation by users have the potential to affect e-learning in a significant way. Advanced students will be able to create websites with useful information and rich resources to help other students – or just for fun. Students will be able to share knowledge through personal websites. The process could benefit informal networks of citizens, members of associations sharing common interests and many other types of communities.

It is obvious that lifelong learning processes can benefit enormously from these new facilities.

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GLOBAL COOPERATION ON E-LEARNING

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Abstract

In a rapidly globalised world, there is an increasing demand for new skills, such as information management, ability to collaborate cross culturally and keep up with the evolving knowledge base.

ICT skills are a must in the global market, and flexible, lifelong learning is necessary to stay competitive. Open and distance education (ODE) is flexible enough to give answers to the challenge of lifelong learning in the global society. However, ODE is not only a technological issue, but just as much a question of the effective pedagogical approaches. The Global Virtual University, a branch of the United Nations University, combines the main pedagogical approaches in its online education.

Introduction

A female psychiatrist, refusing to write her journals on a computer, risks losing her licence to practice, a Norwegian newspaper reports. The reason is that when the journals are not available on the hospital's intranet, her colleagues cannot take over when she is absent, since her handwritten journals are locked in a filing cabinet in her office. Having all journals accessible on the intranet is part of the hospital's quality control system. The psychiatrist argues that she has better contact with her patients when sitting face-to-face, with a paper note pad in her lap; that she feels slightly alienated in front of a computer; and that she does not have the time to take extra education in ICT [1]. This story demonstrates some of the problems with ICT: the risk of alienation and exclusion of individuals, maybe with a gender bias; the possibility of 'big brother' controlling 'everybody' under the disguise of quality control; society's increasing demand on expertise to keep their education up-to-date; the necessity of full commitment in a community of practice to be at the core; and the increasing importance of access to information. The story gives a glimpse of the postmodern, globalised world and demonstrates the necessity of lifelong, flexible learning and learning flexibility, the very buzzwords of open and distance education. The story even tells us that there is no way back: Old ways cannot compete with the tremendous advantages and possibilities of ICT.

E-learning: an answer to the challenge of lifelong education in the globalised market

Technologies have an increasing impact on our lives. ICT evolves at a quick pace, affecting the way we live , work and how we access information, communicate and learn. To meet the challenges of the knowledge society, it is crucial to understand how people learn and how ICTs can assist in the process. Simultaneously, globalisation is a powerful driving force, giving most kinds of learning activities a global context. Corporate businesses of today demand a flexible labour force with the ability to adapt to rapid changes in the market. Generic skills, specialised knowledge, innovation and collaborative problem-solving are more in demand than ability to take instructions and doing routine work. The individual has to consider how to make him/herself attractive on the global job market, not only once, but constantly because of the volatility and insecurity of the market, even in the hitherto 'secure' public domains of public servants and teachers. The shift from inter-product trade to intra-product trade has intensified global competition and made international trade less complementary and more predatory. According to Hoogvelt [2] a global market discipline has been installed where awareness of globalisation constrains individuals, groups and even national governments to conform to international standards of price and quality. On this background it is interesting to note that the eLearning Industry group (eLIG), a consortium of ICT and e-learning content providers, states that for the EU, aiming at being the most competitive knowledge based economy in the world by 2010, it is crucial to have a widespread deployment and adoption of e-learning throughout Europe in education, in the home and in industry [3].

During the last 200 years our society has transformed from being relatively static to a society where "the only constant is change". Certainty is gone. There is an abundance of perspectives on everything, even on scientific fundamentals.

The discovery in quantum physics that an event is ultimately inseparable from its observation undermines the assumption that science is objective and impersonal. Science has tried to formulate general explanatory laws that apply universally; laws which were in operation before they were discovered, and which would have been discovered sooner or later by somebody. This notion of impersonal objectivity is partly gone. A largely mechanical view of the world is shifting over to being a more ecological, holistic and constructivist view.

Applied pedagogical approaches in e-learning

One way of coping with the dynamic world of the post-modern, global society, is to move from the traditional, rather fragmented way of experiencing the world to a more holistic approach. This means to build an understanding of physics and the human world, not on a perspective that reduces material and living units to smaller units, but on a perspective that integrates fragments into meaningful patterns with networks of communication. We develop holistic understanding and knowledge.

Eisenstadt and Vincent [4] define knowledge as: "…a dynamic process, a vibrant, living thing, resting on shared assumptions, beliefs, complex perceptions, sophisticated yet sometimes crazy logic, and the ability to go 'beyond the information given'. Knowledge is the correct abstraction for describing what people communicate to one another. Information and content are not."

There is a widespread misconception that e-learning is mainly a technological challenge. But mastering the technology is just the first step. In our experience, the main issue is pedagogical. To teach and learn in a holistic way probably entails a 'deeper' approach than technology can go.

There are many ways of teaching and several ways of learning. The ways can be seen in a teacher's perspective, and in a learner's perspective. Samuelowicz and Bain [5] suggest that there are five levels of teaching, going from a 'surface' approach to a 'deeper' approach. The levels are described as: imparting knowledge, transmitting knowledge, facilitating understanding, changing students conceptions and finally: supporting student learning.

Conversely, seen from the student's perspective Säljö [6] describes six levels of learning going from a surface approach to a deeper one: Quantitative increase in knowledge, memorizing, acquisition for subsequent utilisation of facts or methods, abstraction of meaning, interpretative process aimed at understanding reality, and developing as a person.

C. Watkins *et al.* [7] see learning as action-oriented. To be effective, learning must be a "reflective activity, which enables learners to draw upon previous experience to understand and evaluate the present, so as to shape the future action and formulate new knowledge".

According to the authors, central for 'Effective learning' is the difference between 'performers' and 'learners'. While the learner believes that effort leads to success, the performer thinks that ability will do it. The learner thinks he has ability to learn and improve, while the performer is concerned about how others judge his performance. The learner will have a preference for challenging tasks, while the performer gets satisfaction in doing better than others. The learner will go for the personal satisfaction of succeeding while the performer will emphasise competition. When engaged in a task, the learner will have a problem solving approach, while the performer will tend to evaluate himself negatively when the task is difficult. The learner will have concern for improving his competence, while the performer will have concern for proving his competence. Focus on performance will tend to result in greater helplessness, reduced help-seeking, less strategy use and greater focus on grade feedback. Bruner [8] in his "Folk pedagogy" describes four models of learning: Learning by being shown, Learning by being told, Learning by constructing meaning, and: Learning by joining a knowledge-generating community.

From instructional to social constructivist approach

As we wrote earlier, there is a common misconception that e-learning is mainly a question of technology. Fortunately, we may say, Steeples & Jones [9] know better than that when they write: "Technology is not what learning is all about. Learning is essentially about change. Learning involves changes in attitudes, beliefs, capabilites, knowledge structures and skills [ibid]." The failure to realize the difference between technology and learning is probably the most common explanation for the many student drop-outs from several online courses. "Whereas at one time technology might have appeared as the solution, particularly to educational administrators, experience has shown that it is neither a replacement for the teacher, nor a particularly cheap option" [10].

Most approaches to teaching and learning can be sorted in three main blocks: Instructional; constructivist; and social constructivist or socio-cultural.

The instructional approach is the traditional teacher and content-focused approach, described above as mainly 'surface' teaching, or as the first two categories mentioned by Bruner. This approach tends to see learners as rather passive receptors absorbing and regurgitating what the teacher tells them. The learners are dependent on their teacher, who selects the sources, decides pace and judges the student's performance. Basically, the instructional approach sees 'knowledge' as fairly static and objective. The approach is an effective tool for the teacher to set the pace, cover the syllabus and be in control. It does not usually call for deeper understanding, and encourages 'performers'. However, in a complex or a supercomplex world, the instructional approach may not always be sufficient, nor the best way to learn.

The central idea of the second approach, constructivism, is that people have to be active learners and construct knowledge themselves at least partly based on what they already know. The knowledge is seen as subjective, dynamic and expanding rather than objective and static. The main tasks here are processing and understanding of information, making sense of the surrounding world. The learner has a clear responsibility for his own learning. Constructivism demands participation at all levels and moves responsibility and empowerment down the hierarchy, thereby flattening it. The teacher, the instructivist 'Sage on the Stage' will increasingly become a 'Guide on the Side' in this setting. Bearing the increasing state of super complexity in mind, it is important to realize that students, in addition to learn and understand existing knowledge, should themselves produce new knowledge in order to be a part of the 'knowledge society'.

This realisation leads to the third approach, the social constructivist or socio-cultural, which means that the student joins a knowledge-generating community and in collaboration with others solve real problems in an authentic context as part of their study. In a socio-cultural environment, the teacher will himself, though an 'old-timer'; a master , also be a learner together with her students, as the generic skills of collaboration, problem-solving and creating new knowledge are important goals by themselves. The time and pacing will be seen as somewhat less relevant compared to instructional studies. Learning is a social activity where the students have to use the information they gather actively by using it in discussion with others. Stating opinions is fine, but the students must as a rule also support their statements by referring to reliable and verifiable sources. The demands to academic rigor are about the same as for instructivist courses. In addition: the participants learn synergistic collaboration and socializing. It is much easier to keep up the study motivation together with others. Communication skills are improved. The student uses the information gathered by formulating and stating arguments. The knowledge gained is actively used and modified in confrontation with the opinions of others, and thus understanding and insight increase with the discussions through negotiation of meaning. The socio-cultural approach is well adapted for resourceful adults in lifelong learning situations where the knowledge base rapidly increases and changes.

Goals will have a decisive influence on all teaching activities. Goals, tasks and activities are carefully developed in a study guide giving the students a framework for the course. In addition to the study guide the students are given learning resources such as online libraries, scientific articles, online lectures, videos etc. These resources will be available locally and throughout the world using ICT and collaborative work in virtual grouprooms with students elsewhere.

The Global Virtual University (GVU)

GVU is an online network of universities whose mission is to increase people's sensitivity to, and involvement in, finding solutions for environment and development issues. Under the auspices of the United Nations University (UNU), GVU is particularly designed to meet the educational needs of the developing world in cooperation with universities from all over the world, and the study programmes will primarily focus on sustainable development, thus combining environment and development studies. Students from developing countries are an important part of the target group. Online learning (e-learning) forms the basic educational method for the study programmes. This implies that a substantial part of teaching, collaboration, tuition and supervision will take place in virtual classrooms on the Internet.

The GVU pedagogical approach

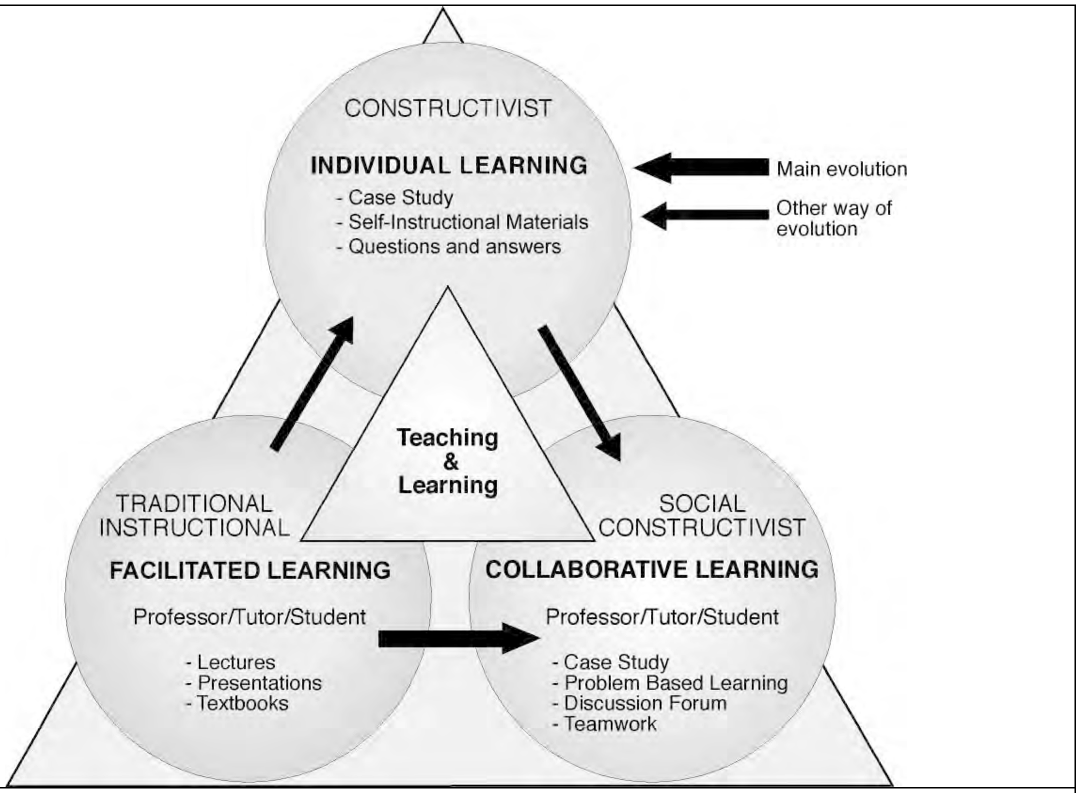

Figure by: Åke Bjørke, Bodil Ask, Debbie Heck and Ng Chong

Instructional (Traditional)
Focus on: teacher and information. Dissemination of information from teacher to students. Knowledge reproduction and expertise. Evaluation: ability to reproduce accurately. ("The parrot strategy")

Constructivist
Focus on: the individual student. Each person constructs his 'truth', making sense of things. Student responsible for own learning. Teacher is a guide, expert and giving assistance.
Evaluation: ability to think independently and creatively. ("The creative thinker strategy")

Social constructivist
Focus on study groups in an interaction with society. Co-construction of knowledge.
Evaluation: as above + critical analysis ("Learning is a social activity strategy")

The Global Virtual University (GVU) sees values in all three main pedagogical approaches. Instructional teaching may be used where the task is to establish a common language, give a quick overview, introductory courses or give personal inspiration and motivation. In our experience it is further an advantage to give 'just-in-time' instructional, written 'minilectures' in the virtual classroom, when the tutors see that this is pertinent in socio-cultural group discussions. When a deeper understanding is needed, a constructivist approach would be useful. "When learners together create a joint product and understanding, they develop higher order skills" "…Co-operative cultures and group investigation methods give better academic results. Learners develop interpersonal and management skills, improved communication skills and positive multiethnic relations" [7]. Boyle [11] supports this by writing: "...Collaborative learning enables learners to accomplish tasks and develop understandings that they could not achieve alone" ... "the need to articulate and communicate ideas provokes students into organizing what they know and identify gaps in their understanding".

GVU wants to establish good collaborative skills by combining some face-to-face (F2F) on-campus teaching with a netbased learning environment supporting on-line conferencing and other Computer Mediated Communication (CMC) techniques. We believe that most people enjoy and learn better through social interaction, and that there is a basic truth in the statement that learning is a social activity. An important tutor function is to balance the pedagogical approaches and create the best learning environment for each task.

Open and Distance Education (ODE) and impact on educational access

ODE gives access to education for thousands of learners who would otherwise have no chance because of geographical distance or inability to combine traditional studies with work. Those who disappear from work over longer periods of time tend to become peripheral in the workplace community and their discourse. The peripheral employees tend to get routine jobs, fewer opportunities for advancement, and are the first to go in times of rationalisation. Most employees, therefore, are reluctant to engage in full time studies. Flexible learning that can be combined with a job, where the studies can be done at the workplace or at home, is ideal for learners who would otherwise have been excluded.

ODE typically involves flexible learning. This implicates according to Edwards *et al.* [12] increased access to post-school education, opening of boundaries between education and work, removal of barriers to accessing higher education, the use of ICT for the delivery of curriculum and the practice of learning. Geographical barriers are obvious issues in remote areas like the Pacific islands, inland Australia, Siberia etc. To many, social barriers may be just as formidable. "Minorities, women, and the poor have all had to struggle across this distance for access ... to higher education." [13] Online, asynchronous interaction between students is perceived as less threatening to many students who are reluctant to speak in face-to-face classes. Men are notoriously dominating classroom discussions (ibid). With asynchronous online discussions, gender, race and social background tend to fade in importance, and the timid have more time to reflect and formulate.

Conclusion

The ordinary professional education may no longer be sufficient to stay competitive. Going from a local society to a global society demands additional skills. Computing and ICT skills give competitive advantages in most areas. Without these skills, many of the opportunities in lifelong learning are not accessible. The professional teacher will find that in addition to his subject knowledge and training in ICT, knowledge and understanding of various pedagogical principles and practices are also needed in order to function in the online learning environment.

GVU has experienced that many professors are reluctant to learn ICT and move into netbased education. Learning to use ICT in an online learning environment often represents a high wall to surmount. Half way in the task of learning the technology, they realize that they have to revise their thinking about pedagogy as well. This is a challenge to all higher e-learning. GVU believes that one way of meeting this challenge is to offer professors a hands-on online course in practical online tutoring; learning by doing in collaboration with other participants from all over the world.

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EVALUATING BLENDED ONLINE LEARNING – AN INTEGRATION MODEL FOR LIFELONG LEARNING

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Introduction

From media pedagogical, learning theory and technocratic-economic points of view, e-learning has hidden potentials which imply structural changes for learning culture and educational organizations. In this manner, educational processes in lifelong learning need e-learning, with which a dematerialisation of learning from place and time ('anytime', 'anywhere'), or distance learning with IT-tools can take place (OECD 2001). In the White Paper of the Management Consultancy Detekon (2002, p. 37), regarding the spread of e-learning in German businesses, one could see, for example, that e-learning is seen as less of a tool and more as communication-orientated learning which is supported by information and communication technology. Sauter *et al.* (2004, p. 21) sum up in the current fourth level of e-learning that e-learning means: "the integration of presence learning, e-learning and knowledge management in a learning composition". The first chapter of this contribution begins with these current estimates that, with e-learning of the fourth level in the form of online-learning, the mode of learning is changed to a 'distance-modus'. At the same time, through the combination of presence and online phases, a new form of learning culture has been created for which few didactic basics have been laid out – also due to the inadequate connections between media and androgogical distance didactic.

1. Media and Distance Learning Didactic – an opportunity overlooked for lifelong learning

The, 'e' in e-learning means foremostly, that learning takes place with the help of electronic media. Reinmann-Rothmeier (2003, pp. 32 f.), referring to Back *et al.,* (1998), makes a difference between 'e-learning by distributing', 'e-learning by interacting' and 'e-learning by collaborating':

- e-learning by distributing: here, the functions of the distribution of information are addressed, by which the learner takes on, processes and makes use of information in a self-navigated way.
- e-learning by interacting: in this understanding of e-learning, the learner interacts with the system, which as far as possible, gives feedback (therefore also known as 'e-learning by feedback'). From this point of view, teachers can come into action in the form of 'tele-tutors'.
- e-learning by collaborating: in this, the most 'complex' form, the new media takes on the function of giving the impetus for collaborative working processes between the learner in a learning environment.

These differentiations according to guiding principles cast problems from a face-to-face orientated pedagogy or didactic, which are particularly related to the 'distance' mode. Thus, the androgogical distance teaching discussion for a comparison between conceptualizations of e-learning becomes interesting, differentiating the three forms of technology based teaching-learning-forms. Drawing on Bloh und Lehmann (2002), who take into consideration the international distance learning debate when developing their own online pedagogic, these three forms can be characterized as follows:

- Teleteaching: proceeding from the distance learning didactic in which the face-to-face situations have to be transmitted, the concepts of transmission and dissemination of the teaching situation are at centre stage.
- Computer supported teaching-learning systems: similar to the second form in Reinmann-Rothmeier, this individualization and substitution model assumes that learners take on, process and make use of information through, e.g. web-based training.

- Online (teaching) learning networks: in the third and last form, analogue to Reinmann-Rothmeier, the concept of an environment which makes communication and cooperation possible is at centre stage.

These two points of view from media and androgogical distance learning didactic are at first in common in that they draw upon the typification of the relation between medium and person in learning contexts – but they do so from differing points of departure. The media didactic asks how information can be prepared multi-medially with new media, so that knowledge, in the sense of a cognitive learning spiral, can be generated in the learner. Then, the isolated learners are brought together in a learning room for the joint construction of knowledge. The decisive difference between distance learning and media didactic lies in the fact that, in distance learning didactic, learners are separated from one another as a matter of principle but brought together through the implementation of supervised online learning networks. The telemedia preparation leads to distance teaching and distance learning elements being transmitted in the face to face situations. In this way, new forms of hybrid learning take shape with greater or fewer multimedia elements. Their didactic realization makes a connection between media didactic and distance learning didactic research necessary, as Kerres calls for (Kerres 2001a, pp. 29 and 300 ff.; 2001b).

This demand is not only justifiable normatively, but is also a systematic necessity (cf. e.g. Peters 1997). Indeed, the intersection of the two points of view – e-learning by collaborating and online teaching-learning networks – create a clear separation between the information and communication components during the production of media-supported learning offers, which, depending on the requirements of the didactical fields, are put into practice in differing ways and intensities. Less orientated toward the learning paradigm than the fact that communication between teachers and learners has to take place because of their physical separation, distance learning didactic already concerned itself with questions regarding communicative media at the beginning of the 90s; for example, at the Institute for Educational Technology (IET) of The Open University (Mason 1994; Kaye 1992). At the same time, the discussion with American, Australian, British and Canadian participation on student support began (e.g. Thorpe 1992; Keegan 1996; Moore/Kearsley 1996). Both strands of the discussion based on international distance learning research were only addressed perfunctorially.

First, the central elements of the new learning culture are based strongly on the 'distance learning modus', the hybridity (integration of online and presence learning), change in the role of the 'active one' (teacher and learner) and finally the related learning organization changes. In this way a learning culture is created in an interplay between online and face to face modes wherein learning place and learning space fall apart for learners in the online forms and teachers must develop competences as e-trainers. In the following a research project will be characterized which focuses on a recipient analysis to prove a didactic oriented typology of blended online leaning.

2. Blended online learning – an integration model

In order to uncover basic construction requirements for the complete synchronization between online and face to face phases, we structured the multitude of varying possibilities in the construction of hybrid learning arrangements according to the type of blended online learning (cf. Ribold/Weber 2004) in the research project 'Models of blended learning – a learner type orientated hybrid learning didactic' in cooperation with the University of Halle-Wittenberg, Germany and with the competence network Via-On-Line (Lower Saxony). These pre-fabricated 'Types' are to be understood with reference to Max Weber as 'ideal-typical rationale constructions of necessity' (Weber 1972), the elements of which can be tested on the one hand according to coherence and acceptance on the other. A coherence and acceptance test also demonstrates whether the construction is sound in regard to the formation of a blended online learning model, or whether elements of the 'Types' cannot be explained.

The three ideal 'Types' which emerge from the blended online learning of the research project are comprised from elements of the analysis which are taken as central in the planning of blended online learning. The choice of characteristics ensued from four areas which came about through examination of media and distance learning didactical literature in reference to the heuristic learning (software) model of Baumgartner/Payr (1994) for the formation of blended online learning (cf. Dichanz/Ernst 2001). The formation of blended online learning according to the ideal ‘Types’ came about with the help of an open source learning platform: in the ‘Presence Type’ (Type A), both modes e-learning and presence phases are intermittent, in the ‘Block Type’ (Type B), longer e-learning phases are planned and in the ‘Online Type’ (Type C), a presence phase is only set at the beginning, middle and end of a seminar. In all three ‘Types’, the assignment or problem orientated formation took place primarily depending on the learners’ pre-knowledge of both the subject and e-learning competences. These then also stipulate the role of the tutor, depending on the media design (for further details about the project: Ribold/Weber 2004 and http://netztransfer.com).

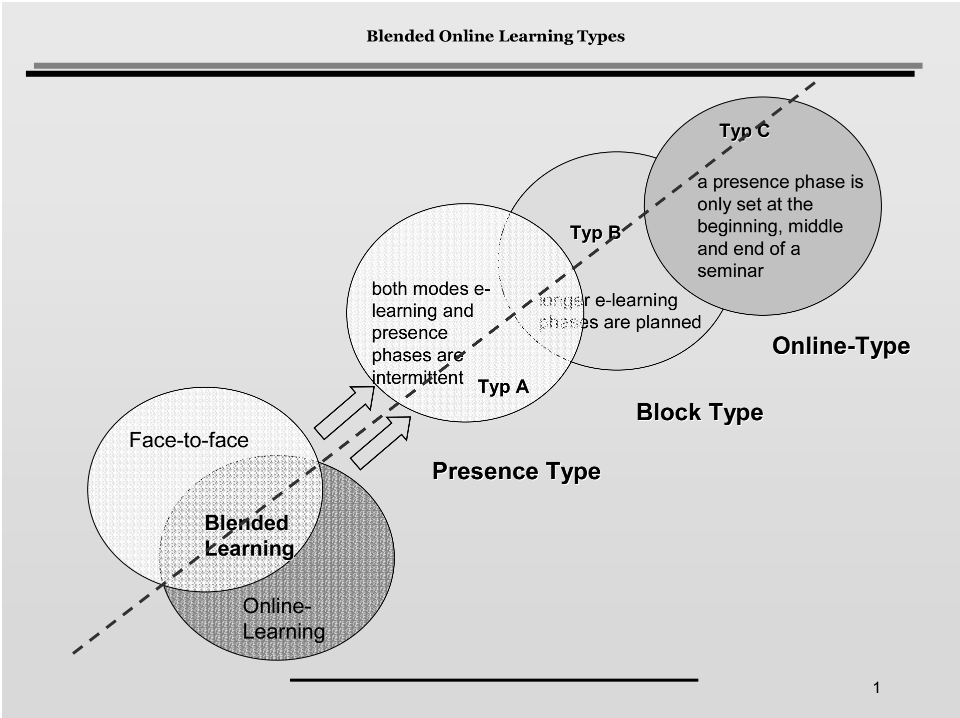

Figure 1. Blended Online Learning Types

The coherency test during three semesters from 2003 to 2004 in Educational Science seminars at the Martin-Luther-University in Halle and the partner universities in Lüneburg, Bochum and Chemnitz have so far shown that especially heterogeneous student populations, insufficient self-study competencies and inflexible university administrative procedures make it difficult to follow a particular blended learning construction ‘Type’ with any consequence – these difficulties then multiply within inter-university co-operations. However, to the credit of the learners, experiences so far also emphasize that confidence in planning can be created within the framework of blended online learning environments in the actual construction process, through pre-determining construction conditions within the three above named ‘Types’. Thus a greater sensibility towards differentiated assignments and problem-solving emerges which ultimately makes a new learning culture of self-organized learning processes possible.

These possibilities can, however, only become reality when a suitable acceptance of this kind of learning culture reigns which is not yet even adequately pronounced in business trainings (Hasebrook/Otte 2002, p. 98). It could be stated at the basis of research results that the motivation in media-supported courses thereby depends on, amongst other things, the course design and its acceptance. According to online learning, face-to-face phases take on an own importance in this tele-medial distance learning context since they are seen as discrete from distance modes. In our research project, therefore, a recipient analysis was conducted as one of four elements of an evaluation (cf. Behrens 1999) to test the acceptance of a blended online learning culture introduced at presence universities. This element was also chosen to support the three utilitarian ideal ‘Types’ of blended online learning empirically if the differentiated perception of the three ‘Types’ is accepted by the learners as an indication of their typical characteristics (cf. Ribold/Weber 2004).

Within the framework of the investigation, participants received a standardized questionnaire at the end of the seminar. As well as socio-demographic questions, it asked about the learners' perceptions of their own self-piloting possibilities through Blended online-learning (grouped under Media Pedagogy); participants were further asked to estimated the didactic coherence between e-learning and face-to-face phases (grouped under Media Didactic); and finally, they were asked about the media/technical arrangements (grouped under Media Technic). Thus far, 240 people were surveyed in the study areas of: Halle (53%), Lüneburg (27%), Bochum (13%) und Chemnitz (7%) for the years 2003 and 2004. According to the ideal 'Types', 31% of those surveyed fall into Type C (Online), 27% into Type B (Block) and 41% into Type A (Presence).

From the analysis to date, one can conclude generally for this particular student population that, for the recipients, the three ideal 'Type' constructions were correspondingly clearly perceived – indicating a certain coherence within the typologies. In a more differentiated observation, it can be determined that the surveyed learners in the presence institutions, depending on their pre-knowledge and their previous media experience, achieve corresponding learning success. If there is minimal pre-knowledge and previous experience and if the course structure does not correspond to the learning preferences, the surveyed learners often reacted with rejection of the introduction of online learning. Of particular decisiveness here are the person-orientation or media-orientation of the learner (cf. Kerka 1998 in a study for the U.S. Department of Education) or also preferred learnstyles (cf. Downing/Chim 2004). A specific efficacial structure between the media competences and the pre-knowledge of the learner and the didactic construction of blended online-learning can be deducted on the basis of the data:

Type A (Presence)		Type B (Block)		Type C (Online)	
Task-orientated	Problem-orientated	Task-orientated	Problem-orientated	Task-orientated	Problem-orientated
⇧		⇧		⇧	
Low Media Competence		Middle Media Competence		High Media Competence	
Low Pre-knowledge	High Pre-knowledge	Low Pre-knowledge	High Pre-knowledge	Low Pre-knowledge	High Pre-knowledge
Person Orientation		Person and Media Orientation		Media Orientation	

Learners with high media competence and media orientation usually accept blended online-learning with a high proportion of online-learning (Type C) as a learning preference whereby the internal differentiation within task and problem orientation depends on the learner's pre-knowledge. This is vice-versa with the Presence Type. The efficacical structure implied here is on the one hand that the construction of blended online-learning and the connected learning targets, contents and strategies must be seen in dependence on the learner's skills and kinds of knowledge (cf. heuristic learning(software)model of Baumgartner/Payr 1994, pp. 96 ff. and 142 f.). On the other hand, the data culled here indicates that media supported learning depends equally heavily on the 'suitable' prerequisites of the learner; therefore, on the own competences (cf. Hasebrook/Otte 2002, pp. 36 ff). In this way, the arrangements of Type C tally with learners who have at least reached the level of competence in their media skills (cf. Baumgartner/Payr 1994, p. 96), and who can also, for example, choose suitable information and strategies for solving the assigned problem. There are also, however, resource-dependent access pre-requisites such as, for example, a suitably fast Internet access.

The recipients' view of the supervision in online tutorials remains central in the construction of the online phases of blended online-learning (e-learning by collaborating or online-learning networks) (cf. Kenworthy 2001; Bernath 2002) and which differ from face-to-face seminar supervision. The difference between the constructions emerge especially through – as yet still technically contingent – linear and rigid communication processes as well as an insufficient social presence (cf. as overview Bloh/Lehmann 2002, pp. 35 ff.). Consequently, the e-teaching-learning forms of action promote self-regulated learning processes only in dependence on a suitable learner-orientated supervision; or, respectively, make professional tutorial accompaniment necessary (Euler 2002) – otherwise many learners are overtaxed by the self-piloted learning culture demanded of them. For them, communication, respectively the exchange between learners in, for example, networks, is central to the understanding of e-learning as online-learning.

It must be emphasised here that the didactic approaches do not make teachers superfluous. Many more highly qualified teachers, who can inspire and support learning processes or accompany and moderate small groups, will be necessary – both in presence and virtual forms (Reinmann-Rothmeier 2003). For organisational and personnel development (employee qualifications profile, demand investigations, structural concepts, planning and so on), this means a necessary double qualification in distance and presence teaching as well as an orientation to modern learning cultures in lifelong learning.

Outlook

Many discussions about e-learning learning culture actually amount to the fact that the economic dreams of e-learning have not really been fulfilled; due to insufficient theoratical backround, no definite e-learning and blended-learning didactic has developed, the learning culture has been bogged down in learning theory potentials and the virtual institutionalisation has been bound too tightly to marketable standards – e-learning is without doubt the learning culture most connected to economisation and globalisation. Yet metaphors such as 'Virtual University' simulate a delimitation to real learning culture which is potentialised through virtualisation. This potentialisation can effect a functional increase within traditional learning cultures. Educational reality in lifelong learning is, however, not virtual (cf. The Commonwealth of Learning 2001), since society itself is in a pre-virtual state.

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ORGANIZATIONAL CHANGE CAUSED BY DISTANCE EDUCATION BOOM

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1. Introduction

While much of the discussion and research around distance education centres on the extent to which it succeeds in duplicating the classroom or laboratory experience, this is, in fact, a distraction. The societal need for and effect of education does not dictate the classroom experience but rather an educational outcome. With longer work lives and accelerating global shifts of industries, life-long education and retraining will increase in emphasis relative to a single concentrated, predictable, and monodisciplinary burst of education ending in early adulthood. Nowadays, in many countries including ones in economies in transition, we are witnessing the distance education boom.

In Republic of Serbia, information technology mediated education is in full swing. Since this is a developing country in transition the domain of education also experiences great changes. A lot of new private-owned educational institutions have been recently established that base at least some of their services on distance and life-long education and now they are fighting at the market for their part of the cake. In this paper, we attempt to predict a destiny for the newcomers and incumbents educational institutions. To this end, in Chapters 2 and 3, we apply recent developments in the understanding of innovation and organizational change that highlight the tension inside institutions that are diligently responding to their major stakeholders when innovations that do not initially satisfy these constituencies first emerge and the potential for dramatic change when innovations, matured in some other organizational environment, finally do address stakeholder needs. For institutions of higher education, the news is mixed; although the facility for intellectual introspection that characterizes higher education may avoid the bloodiest of revolutions, a period of rapid and uncomfortable change is upon us and will leave few institutions and their members untouched. In Chapter 4, the course importation and the development of remote laboratory experiences are explained as good indicators of the extent to which information technology mediated education approaches intersection with the demands of mainstream higher education.

2. Distance and Technology Mediated Education

Information technology mediated education, and in particular distance and on-line education, undermines the traditional constraints of higher education. Higher education has for some time been built around geographically concentrated institutions that collocate faculty, students, and resources, and build over time a brand and reputation that are to a degree self-perpetuating. Distance education breaks the bounds of geography. If distance education is pedagogically effective, there is no particular reason why an institution cannot serve faculties and students on a regional, national, or even global basis. To the extent the technical and organizational infrastructure that facilitates distance education can be distributed, an institution can become virtual, with no geographic location of high concentration.

Observation suggests that neither technology nor sociology yet permit this type of completely virtual educational institution, yet clearly a number of hybrids exist. Traditional universities increasingly have distance education and online options and new institutions have formed that use entirely distance or online distribution. Many still have concentrated faculty and administrative functions to leverage centralized equipment investments (in content production) and management. But the economics of even these partially virtualized organizations are sufficiently different from traditional “bricks and mortar” universities that they serve as a threat to the assumptions traditional universities rely on. Distance education solves one of the main drivers that underlies the employment of educators, the simple need to collocate students to receive instruction, although, arguably some college freshman classes with their 500 or even a 1000 student lectures have already moved the boundary on what collocation limits are. But simply being able to deliver education to larger and larger number of remote students does not insure a quality education. True scalability means that educational outcomes need to be good and it is an open question as to how educational outcomes change as the volume of students taught from a single source increase. But it is becoming less of an open question. Those same large undergraduate classes have been seeing a renaissance in pedagogy driven by both in-class and out-of-class technologies. The same spirit of marriage of theoretical and empirical pedagogy with technology should also apply to distance education. And distance education outcomes are encouraging [1]. Although much may be due to the greater maturity of the typical distance education student compared with the typical in-class student, it is already clear that educational outcomes for distance education tend to be as good or better than in class students.

3. Educational institutions change

How institutions innovate is both an important and difficult topic [2]. Innovation has been particularly studied relative to businesses. The phrase “creative destruction” has been coined to describe the turmoil as older economic institutions are replaced by new ones; at the same time he advanced the hypothesis that ultimately innovation would gravitate towards large companies with specialized staffs [3]. More recent observations are not optimistic regarding the ability of large established organizations to out innovate newcomers; the number of established companies which are able to maintain superior returns to the market over sustained periods of time is small indeed [4]. The challenge of innovation in large, established firms has been addressed by several authors. The recurring issue, though, seems to be thwarting the core culture of large firms, in particular their inertia and bureaucratization. Recently, Christensen and his colleagues [5, 6] have been building a particularly cogent theory to describe a number of important cases in which incumbents have been “out innovated” by upstarts and ultimately largely displaced from a market. He combines the theory of resource dependency, that companies’ actions are largely determined by those who provide them with resources, particularly customers, with the notion of technology overshoot, that a new technology that is initially unsatisfactory to customers may eventually become satisfactory if matured in accepting niches, while incumbent technologies improve faster than customers’ abilities to absorb them. Incumbent firms find it extraordinarily difficult to deal with such upstart “disruptive technologies” because their customers are initially uninterested and the entire incumbent organization, if well run, is attuned to its customers’ needs. The case of distance and computer mediated education seems to fit many of the criteria of the presented model:

- The innovation is simpler, cheaper, and more convenient from the user’s perspective (distance and computer mediated education can generally achieve economies of scale and is delivered more conveniently) but underperforms the mainstream market’s expectations (students perceive an on campus education as being superior in quality and leading to superior job opportunities).
- The mainstream institutions listen to their customers at all levels, and the middle level administration, in particular, continues to try to make improvements relevant to what current customers say they want (for example, applying technology to education but embedded in or supplementary to the traditional classroom teaching paradigm).
- The new innovation starts to develop in niches which so value its particular features (e.g. convenience is highly valued by working students) that they are willing to live with its shortcomings. Fostered in these niches, the innovation improves (both technology and pedagogy evolve to create more effective outcomes).

Who wins in a disruption? Usually it is new organizations that launched the disruptive innovation in niches, helped mature it to the point that it intersected the needs of the mainstream market, then, based on a lower margin model that is adapted to the disruption, take away much of the market opportunity served by the incumbents.

Distance education is not a complete match for Christensen’s model, in the sense that it is not yet clear whether distance education can completely intersect mainstream needs. Residential universities provide more than just education; they also assist in the socialization and maturation of young adults and that group of students would need to be socialized by other institutions if they receive most or all their higher education at a distance. Distance education presents substantial challenges to peer instruction and to the formation of social networks that persist after the degree and that may be one of the major advantages of elite programs. Participation in hands-on and team research projects are made more difficult. And active learning is different in distance education than in traditional classroom education, particularly asynchronous education; although here we might expect technology to provide other active learning solutions that are potentially as good or better than classroom interaction. The sum of these issues could retard or diffuse the impact of distance education, although it is more likely that the result will be differential impact across institutions.

4. Individuals change

Earlier, we described how institutions might respond to the pressures of distance and computer mediated education. Simply put, we believe that many institutions will ignore, dismiss or misinterpret the potential impact of this innovation and eventually, find themselves in crises. And those traditional institutions that do respond will likely address the problem by creating separate units within their organization to implement this type of alternative education mechanism. Considering these scenarios, how might an individual within such an institution respond?

Individuals will likely mirror the general resistance discussed earlier. This should not be surprising given that most academics enjoy the environment afforded to them by their institution. Wholesale disruption of this environment creates discomfort that most would not embrace. With this said, there are those who will not resist such change, and the question to consider is their reaction. A practical starting point is to consider whether the individual accepts the argument that these new educational methods will be fundamentally disruptive. They might also consider the potential impact on their home institution. For example, are they research-active individuals from a "research one" institution or are they teaching-active from a college that does little-to-no research? An individual with a strong research focus may not be motivated to change in that the disruption might not be perceived as being significant. It is worth noting, however, that even these individuals may be impacted as subsidies from teaching revenues dissipate. Regardless of their ability to affect such change, an individual might consider what aspects of their own teaching could be enhanced through distance and computer mediated education. For example, (1) they might consider which courses they teach lend well to exportation or importation, (2) they might consider how to include computer mediated techniques, such as remote or simulated laboratory experiences to broaden or reinforce their present teaching or (3) they might consider collaborating with colleagues from other institutions.

5. Indicators

We now turn our attention to the applications that can signal the maturation of information technology mediated education; specifically, we examine the role and potential disruption of *course importation* and *remote laboratory*.

The concept of course importation is straightforward. It simply involves taking advantage of communication technologies that allow for the import and export of courses from other institutions. There are various reasons why an institution might wish to import a course, including: to cover a subject area of local deficiency, to provide new or better insights into the subject matter, to reduce costs and/or to move the institution into a new area. Regardless of sometimes perceived disadvantages, course importation is occurring widely, which leads us to wonder how presented model applies to this modality. We describe this applicability as follows:

- Course importation is simpler, cheaper and more convenient, but underperforms on campus coursework.
- Some institutions may attempt to integrate importation into the traditional methods, but not embrace it with the same zeal as more adept/innovative institutions.
- The importation and exportation of courses will start to develop in, which will tolerate the shortcomings and subsequently foster improvements. Such institutions will realize the potential for profit and provide professors with the incentives to participate in such activities.

As we have demonstrated with their computer mediated education modalities, remote laboratory applications fulfill the characteristics of a disruptive technology. Rather than reiterate such a demonstration, we now consider how this application extends distance education. Direct experience with current tools and equipment is the link from theory to practice in any technical education. The cost, availability, and physical access to this equipment have always been important factors limiting the number of students who can receive such education. The internet now provides an almost universally available communications infrastructure for learning theory. The challenge is to extend this infrastructure to support distance-learning practice.

Interestingly, the concept of remote laboratories builds on the weaknesses that exist within distance education (the inability of students to gain practical experience that builds on the theoretical) and simultaneously creates a new set of problems (the inability to create a virtual world that mirrors the learning experience of the real). Remote laboratories allow more students to benefit from laboratory experiences and, through deeper and more interactive exposure to the subject material, further their abilities and understanding.

6. Conclusions

As information technology mediated education continues to move from experimentation to the mainstream of distance education. We are presently building an infrastructure for telecommunications experiments that students can access through the Internet using the conventional browser software. We can expect considerable resistance from established universities. Further, as this technology matures to produce the educational outcomes expected and acknowledged by employers, there arises the potential for sudden and drastic impact on the traditional professoriate and their respective institutions. In this paper, we described how new entrants could apply information technology mediated education to *out innovate* traditional educational institutions. We also described how these institutions (and the individuals from within these institutions) might react to this change. Lastly, we highlighted the potential of this technology by describing two applications that provide sharp indicators of a mainstream transition to distance education, namely course importation and remote laboratories.

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LEARNING FACE-TO-FACE, IN-ACTION AND ON-LINE: INTEGRATED MODEL OF LIFELONG LEARNING

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Lifelong education proposed by the University of Padua goes over the specificity of *adults and vocational education* and integrates the concepts of *lifelong* and *lifewide learning* (1).

When G. P. Quaglino reflects upon the meaning of education as "to enable learning" (2), he singles out, with reference to psycho-pedagogical literature, three typologies of learning: *self-directed learning, reflective learning* and *transformative learning.* Deep analysis of Quaglino's scheme allows us to adapt it in order to extend its sense. It is possible to foresee a way to overcome the pedagogical ambiguity of the expressions *"savoir, savoir faire, savoir être,"* and to surmount, at the same time, the functionalistic anguish of the three dimensions derivative from knowledge: *"intellectual, gestural and of communication with others"* (3).

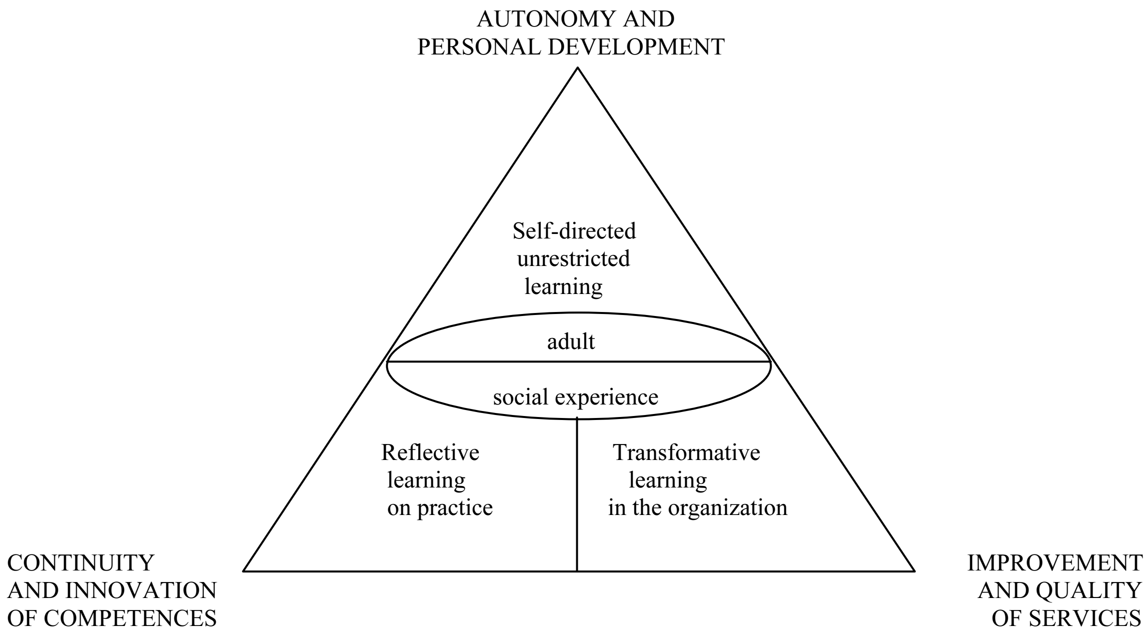

Figure 1.

The scheme points out the andragogical specificity of adults' learning, which is not of a psychological nature. It is rather anchored to experience and social responsibilities as constant references, thus connecting the idea of education with the Greek etymon *morphé* (biogenetic realization of individual identity, always unfinished) and to the Latin etymon *forma* (modelling of the self and perfectibility regarding a self/hetero defined ideal) (4).

1. Technical-scientific education and reflective learning on practice

The technical-scientific education, meant as *training* and *adjournment*, favours *learning reflective on practice*, on action, on performance. The "reflective practitioner" described by Donald Schoen (5) must start from the *technical rationality* of his own professionalism (defined, specialistic, standardized, founded on basis science and applied science) in order to reflect *while in action*. Such reflective professionalism (artistic, initiatory, practical) compares single cases to other situations and builds a theory (context), explores and promotes interaction of means and goals aiming to produce intentional change (experiment), distinguishes among contrasting solutions and carries out a transaction with the situation (verifies hypothesis).

Therefore technical-scientific training implies, at the same time, continuity and innovation of disciplinary knowledge and professional competences. Professional competence should evolve into a “refined” knowledge: the result of numerous and recursive levels of mediation highly aware of signs, details, holistic complexity, and multisided interpretations.

2. Social-organizational training and transformative learning

The *social-organizational training* favours *transformative learning fosters* transformation of the *professional mission* in connexion with the *company mission*. Both missions are strongly related to the social and economical goals of competition which takes place in the complex globalisation scenery. Every project aimed at promoting organizational change has no chance of being successful if it doesn’t engage with responsibility all the actors involved in the process such as stakeholders, inside actors and customers.

The lifelong professional development of every practitioner must therefore also comprise organizational and social-ethical competences. The solution can not be derived from an improbable syntonization among the expectations of practitioners and the demands expressed by the organizations. It must result from the transformation of a professional “self”, comprehensive of profound relational impact and increasing social responsibility (6). Therefore, training must be designed as a means to escape the worn-out schemes of the economical-functionalistic approach to organization, and move in the direction of new perspectives like social constructivism as well as professional communities of practices and discourses. Only the latter can endorse collaborative learning and cooperative work. It implies hetero-evaluation of the professional competences profiles and analysis of the gaps to be bridged by training, but also dynamic shared *assessment* of individual development profiles (openness to the third typology of learning: self-directed and unconstrained), and above all, *assessment* of *transversal competences* – the *live skills* set by OMS as foundations of every educational setting: cognitive, relational and affective skills.

Best practices supported by *action-research* and *intervention-research* succeed in containing the resistance to changes in the professional culture. As long as verified methodologies are applied, uncertainty is strongly reduced. Collaboration enables an agreement about goals focused on the overall improvement as well as individual, team and departmental development. The process is carried out by all protagonists, covers each phase of the research and comprehends evaluation *in itinere* and *ex-post.* (7).

3. Psycho/socialpedagogical education and self-directed learning

Psycho/socialpedagogical education, targeted at the autonomy of adults in advanced phases of their development, favours *self-directed learning* and unconstrained choice of contents, methods and pace. It places the right to take care of one’s own human *self* above the professional *self,* the right to accomplish one’s own life project *also* on the professional field.

According to this prospect “education is a process of global changes of the person” (8), aiming at conciliation of personal development and social/cultural adaptation. It would be a heavily restrictive prospect if education ended to be considered as a *dependent variable*, at one side*,* of *the organization* and of its goals concerning quality of services offered to customers/citizens, and at the other side, of the operators’ professionalities and their different competence profiles, defined in relation to working contexts.

The idea that educational events of good technical/scientific/methodological quality or well designed programs aimed at the improvement of the organization can *really* change the operators’ professionality and their performance, could be a fathomless illusion if these events are not perceived as congruous with the deepest instances of the person/user’s personality. Thus *self-directed unrestricted learning* has to be considered as an independent variable regulative of both the sense (value, motivation, participation, belief) and the success (conation, decision, transformative action) of education.

4. Interaction of face-to-face, in-action and distance learning

Education can not do without a negotiated and specific project, congruent with the context, mediated at the same time by the person/practitioner, the technical/scientific knowledge, the organization/institution. It is clear that education is a social event with not only psychopedagogical or scientific components, but also juridical, economical, ideological and political dimensions. Within this scenery of "limited rationality", it is possible to envision in lifelong education a threefold modality of learning (face-to-face, distance and in-action), modelled by a new pedagogical design of *interaction and integration.*

4.1 Face-to-face education

Face-to-face education allows the interaction of *self-directed and unrestricted learning* – and therefore the individual choices of events and training courses, the autonomous study of texts and materials, etc. – with learning of competences and abilities coherent with technological and scientific evolution of knowledge, so that it is possible to promote reflective thinking about the renewal of professional practices. The acquisition of new concepts and methods must be articulated with personal development, meaning that education has to be "epistemologically valid" and, at the same time, "psychologically formative".

In order to be useful, from a psychological point of view, face-to-face education should be based on methodologies that imply comparison of professional practices through the narration of personal experiences (9).

4.2 Education in-action

Education in-action allows interaction between reflective learning on practice, aimed at innovation of practices by means of fostering knowledge and levels of expertise, and transformative learning, aimed at the alignment of practitioner's professionalities with the continuing changes and strategies of the organization. Every practitioner is bound to evaluate the congruency between his personal selection of learning events and learning in-action programs as well as applied research activities and performance-oriented workgroups. This interaction must seek combination of elective contents, methods, partners and purposes with the social needs of the profession performed in a certain organizational context, meaning that education must be "epistemologically valid" and "socially useful".

This issue's high relevance outbounds the pedagogical field once formative actions always "induce social reproduction" (10). It implies multiple conceptions of the person: as objects/products to be qualified according to social needs, as subjects wanted to be able to manage changes and, finally, as agents apt to intervene not only in their own practices environment but also in the evolution of the society.

4.3 Distance education

Distance education allows interaction between transformative learning, acting upon the professional and the social "self" in the *local* organization, and the needs and choices of a self-directed learning, achievable in case of free access to the *global* network of information and knowledge.

It is possible to launch, in this dimension, a virtuously competitive challenge involving the modalities of education that support improvement of the organizations' internal knowledge, at local, regional, national or European level, up to a worldwide level. It will be a challenge governed by the practitioners who are able to search information in directories (11) that are not only institutional, and seek knowledge in a digital semantic web of remote resources, scientific research readings, and experts at an international level.

So it will be possible to combine personal development and social/professional adaptability, that is, education being at the same time "psychologically and socially useful". This means, of course, to go beyond the vision and the practice of distance learning and e-learning (12) that consists only in an expensive industrial production of audiovideo and multimedia materials (Learning Object according to

SCORM rules) and their distribution aimed at individual self-paced-learning depending on expensive platforms (Learning Management System). The educational value of the distance and flexible e-learning is given by the synchronous and asynchronous on-line training activities and therefore by means of virtual learning communities or communities of practice.

5. Integration of face-to-face, in-action and on-line education

The proposed model is completed and enhanced by an ulterior level of pedagogical integration involving face-to-face, in-action and on-line education.

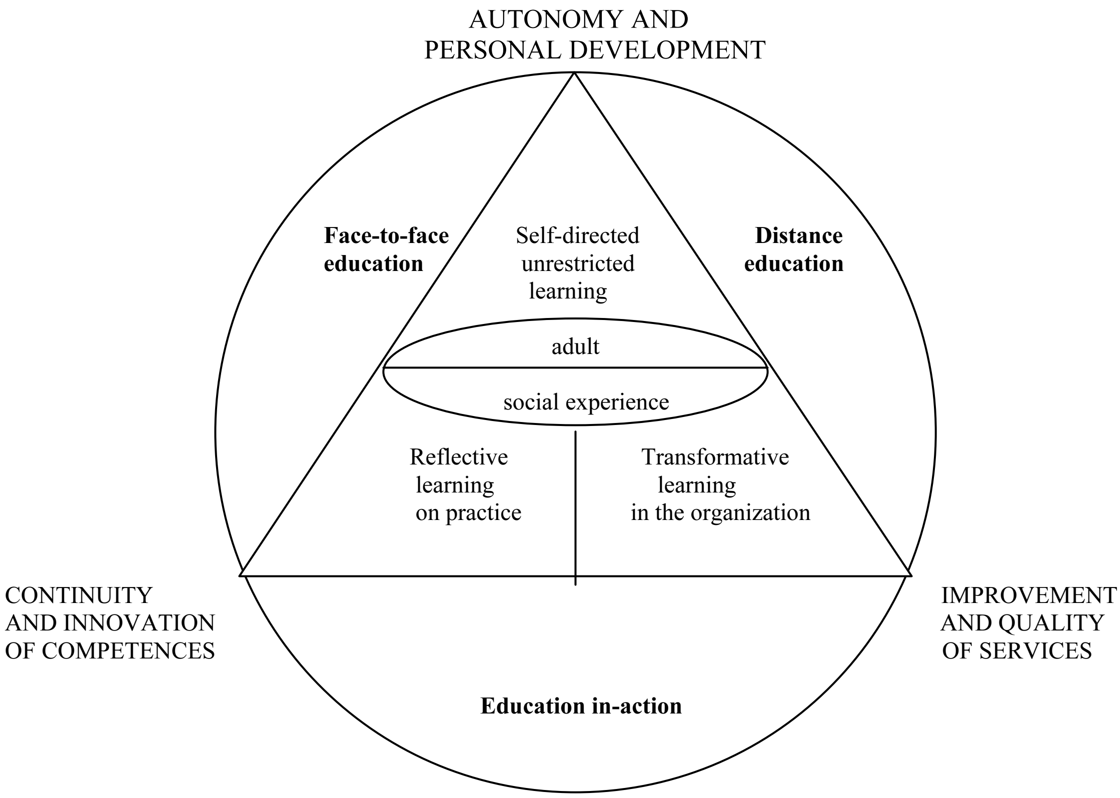

Figure 2.

Above all, the figure depicts a triangle of learning which is contained in the circle of education, suggesting that learning and education are never perfectly superimposed. Education should be always superabundant and offer multiple technological and linguistic ways to communicate scientific, humanistic and social knowledge in order to stimulate in each learner some level of personal way of learning.

Different studying methods and communicative interactions in the classroom, in the professional environment and on line, improve specific ways of learning (interactive, active, cooperative) and are correlated to different categories of learning objectives (for example: acquisition of procedural knowledge, practical abilities, transversal competences).

Keeping apart learning spaces makes planning and organization of events and courses apparently easiest, but it is an artifice that often reveals itself as ineffective in the presence of adults, used to practise their professional competences in the complexity of different situations. In fact, practices and experiences do not guarantee always excellence in problem solving when they are separated from scientific knowledge, from theories, from systematic approaches, from discussion in teams and from shared evaluation of the results.

Our model aims to valorise original aspects of each methodology (face-to-face, in-action, at distance) and its related learning paradigm (rationalistic-transmitive, systemic-interactionist, social constructivist) (13).

The resulting framework of our projects, courses and formative events allow the exploration of each of the four stages of the learning cycle, as described by David Kolb (14). The four stages define adults' learning styles (accommodators, divergers, convergers, assimilators) and reflect two main streams: tension between quotidian concrete experience and abstract thought, and tension between active experimentation of innovative practices and reflective observation.

6. Conclusion

Supported by a pluriannual experience in lifelong education, conduced at the Faculty of Educational Sciences at the University of Padua, we affirm that it is possible to realize educational projects throughout a continuing process that departs (first stage) from experience of the reality (perceptions, feelings, intuitions) submitted to reflection by means of observation and description, in order to promote understanding "in-action" – with reference to cognitive flexibility theory – of the different points of view and approaches (second stage) (15). The reflection "on-action", frequently supported by the use of conceptual maps and journals, leads to generalization or conceptualization by means of scientific explanations, systematic approaches, abstract theories (third stage). Generalization through "reflection for-action" (16), conduces to a design framework cantered on collaborative work, on manipulation of techniques and resources, on transformation of the *status quo*, on situated practice, and on the evaluation of performance (fourth stage).

The cycle – integrative of face-to-face, in-action and on-line education – keeps going on because the active experimentation in-action produces *situated knowledge* but, at the same time, is opened to new concrete experiences, enriched by new competence, thus enabling innovation and professionalism growth.

Under this perspective, the integrated model of *lifelong learning* is at the same time a model of *lifewide learning*, where the educational action spans from real space to cyber-space.

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A MATTER OF PERCEPTION? TRANSACTIONAL DISTANCE AND STUDENT SUPPORT IN DISTANCE EDUCATION

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Abstract

Research shows that between 30 and 50 per cent of all students fail to complete distance courses, in stark contrast to the more successful completion rates of conventional courses (Simpson, 2004; Moore & Kearsley, 1996; Daniel & Marquis, 1979). We argue that it is not the geographical distance, but rather the perceptual distance between students and teachers that most significantly contribute toward these greater attrition levels in distance education. This premise is based on the theory of transactional distance (TD) (Moore, 1973). TD has the potential to create problems of misunderstanding between separated teachers and learners. Through data gathered from a naturalistic study, we present the case that technology and media are mediating influences that can amplify or reduce the negative effects of transactional distance.

An opportunistic sample of mature students studying at a UK University participated in this study (N=348). All participants completed two sets of instruments (Likert scale questionnaire combinations), the first at the commencement of their studies and the second between 6-9 months into their course of studies. The participants in the research were enrolled on teacher training courses, ranging from first year undergraduate through to master's level study. Participants were studying in a variety of modes including exclusively distance based, and predominantly dual mode, or face to face mode. Students were asked to provide a range of data including demographic details, preferred approaches to study and their perceptions of tutor support, quality of dialogue and structural aspects of their programme of study in up to four modes of communication.

Factor analysis revealed that factors representing structure, immediacy of dialogue and social presence existed with strong interrelationships between the identified questionnaire items. Structural equation modelling was used to enable pathways between factors to be represented and measured. Although none of the proposed hypotheses were fully supported, several findings emerged which predicted user responses and perceptions of immediacy, social presence and structure within specific communication modes. From these findings, we propose an extension to Moore's model of transactional distance, incorporating two sub-divisions of the dialogue variable – social presence and immediacy. The paper concludes that a more in depth study of the above identified variables may be the key to the unlocking of our understanding of the true nature of separation between distance learner and tutor.

Introduction

Perceptual distances have a profound effect on learners who are separated for long periods from their tutors, and appropriate tutor support is required to bridge these distances effectively through the use of mediating technologies. High student attrition rates have been evident in distance education for some time, with up to half of all students failing to complete their studies (Ross, Morrison, Smith and Cleveland, 1991; Moore & Kearsley, 1996; Simpson, 2004). If this unhealthy statistic is only partly due to the distance students perceive between themselves and their tutors, perceptual distance must assume significance as a research focus. The means through which perceptual distance can be empirically measured and analysed constitutes the methodological basis of this study. We apply Moore's theory of transactional distance (1973) as an explanatory framework, with perceptual distance predicted by the variables of dialogue, structure and student autonomy. The study utilises Entwistle's Approaches to Study Inventory (1981) and two additionally devised inventories to measure the variables predicted to influence the level of transactional distance perceived by blended learners. Path analysis and structural equation modelling, using latent variable analysis, are applied to enable visualisation of the relationships between these variables, and to establish the statistical power and validity of the research findings. We conclude that transactional distance could be analysed more deeply if two sub variables of dialogue were recognised. These are social presence – the perception of connectedness between students and their tutors, and immediacy – the temporal effects of dialogue.

Transactional Distance Theory

According to the theory of transactional distance proposed by Moore (1993, derived from earlier work by Dewey and Bentley, 1949) there is a degree of perceived distance present in *every* educational transaction. It must be considered a key theory in the light of the growth of blended learning. The transactional distance between student and tutor, whether it is based upon perceptions of intellectual distance, demographic variables such as age or gender, or cultural distances such as language, may create the potential for misunderstandings to occur. The same might apply in interactions between peers within a group, or between groups of separated students. The tacit power differential between tutor and student may also have an influence on student perceptions of distance. Moore's theory is principally applied in this study to the learning transactions between teacher and learner, with other types of transaction beyond the scope of the study.

Transactional distance theory predicts that the psychological or perceived distance between students and their tutors vary as a result of the mix of the structure and dialogue present within a transaction. According to Moore, structure and dialogue are in relative counterbalance. If structure is high, dialogue will decrease accordingly, whereas if dialogue is high, structure will decrease. Moore's theory predicts that greater presence of dialogue in the learning transaction should reduce transactional distance, lead to better understanding and a lessening of the potential for misunderstandings to occur between tutor and student. Another important tenet of the theory of transactional distance is that autonomous students tend to experience less transactional distance, whereas the opposite is thought to be true for students who are more reliant on tutor input. Less autonomous students should therefore be more susceptible to negative effects of transactional distance where dialogue is not forthcoming. In this study, the testing of these aspects of transactional distance theory is not as important as the investigation of how information and communication technologies (ICTs) may mediate psychological distance. The manner in which ICTs are deployed in distance education will be represented in this study across four modalities, one of which is the baseline measurement of face to face communication, and three distance based technologies, telephone, e-mail and videoconferencing.

Our hypothesis can be stated in two parts. Firstly, students whose dialogue with their tutors is mediated by technology should report greater (i.e. more remote) transactional distance than students whose dialogue with their tutors is conducted through face to face communication. Students should perceive more remote transactional distance when communication is technologically mediated largely due to the reduction of social cues and a decrease or inhibition in the richness of communication that would normally be expected to be present in face to face dialogue. Such reductions should amplify the potential for misunderstandings to occur and for a raised perception of distance due to a lessening of social presence. This in turn would cause levels of student dissatisfaction to increase.

Should the data fail to support this hypothesis, it may be possible that dialogue between tutor and student is not reduced in its power when mediated through technology. A result of this kind may be indicative of social cues maintaining a sufficient richness to facilitate dialogue between students and tutors that is at least equivalent to face to face communication due to affordances within the technologies. It is also possible that other unconsidered variables, including random variability within the data set have an influence.

Secondly and more specifically, we predicted that distance learners would report more remote transactional distance if communication with their teacher were mediated through asynchronous text based technologies such as electronic mail. This may result in less satisfaction with the learning experience due to a greater potential for misunderstandings to occur. Where synchronous technologies such as telephone and video conference are employed, distance learners should report less (i.e. closer) transactional distance, leading to greater satisfaction and the potential for less misunderstanding to occur during communication with their tutors. This could be due to the tendency of synchronous forms of communication to sacrifice structure in favour of greater dialogue between interlocutors.

Synchronous technologies are also thought to provide more immediacy of dialogue, providing remote students with rapid support and guidance during study.

Co-present (or face to face tutorials) were therefore predicted to evoke the least amount of perceived transactional distance due to their high level of personal interaction (which will be referred to as 'dialogue'). Attributes of rich dialogue in co-present settings include physical proximity, para-verbal communication, visual signals, backchannelling and other conversational cues, as well as immediacy of responses which in combination contribute to a sense of social presence.

As the interaction between student and tutor reduces in richness, and becomes less immediate and less spontaneous in nature, so the student's perception of co-presence should decrease, leading to raised feelings of remote transactional distance. This in turn should lead to greater potential to misinterpret meaning and ultimately, less satisfaction with the learning transactions and experiences.

Should the results fail to support this hypothesis, it may be possible that dialogue within telematically mediated communication may rely less upon visual- and para verbal-cueing that is posited. It may be that affordances within the communication technologies either compensate for, or negate the need for such social cues. Alternatively, other variables such random variability, or possibly the effects of other, unknown affordances within specific technologies may be at work.

Theoretical Model

We began by creating a theoretical pathway model to represent the possible influences on student perception of transactional distance (Figure 1).

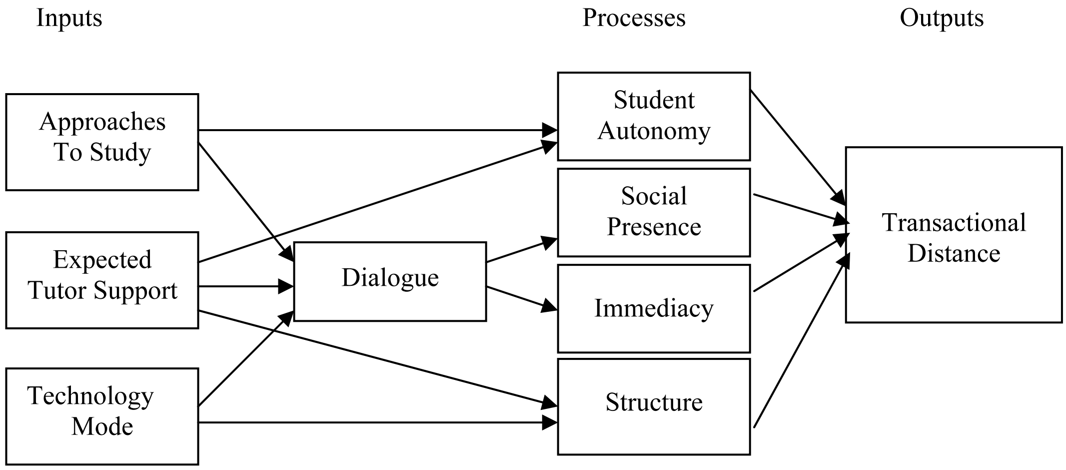

Figure 1. Technology Mediated Transactional Distance Model

Method

Participants were asked to complete a questionnaire presented in a 5 point Likert scale format, containing Entwistle's Approaches to Study Inventory (1981: Appendix 1), the Student Support Inventory (SSI: Appendix 2) and the Communication Mode Questionnaire (CMQ: Appendix 3). These additional instruments measure students' perceptions of expected and received support and perceptions of dialogue, structure and transactional distance in different modes of communication.

Sample

320 undergraduate and 28 postgraduate students enrolled on courses in higher education participated (N=348). A range of courses from certificate and post graduate diploma level in education (initial and post graduate teacher training) and business studies are represented in the sample. The participants were chosen as a representative sample of students across a broad spectrum of blended study modes ranging from conventional face to face learning with directed study undertaken either at home or at

place of work, through to exclusively distance based study mediated through technology (either online or print based). Most participants were engaged in a combination of face to face and technology supported learning, a blended method of learning which is representative of the flexible approach to study adopted by many students in British universities.

The participants were predominantly female, with 307 females and 38 males in the sample (three participants declined to report their gender). This gender bias is consistent with similar recent studies where females constitute the largest percentage of students studying on humanities and liberal arts based courses in the United Kingdom (Goodyear, *et al*, 2003). The participant group, as is often the case with students engaged in continuing professional development, was predominantly a mature group, comprised mainly of fully employed individuals who were engaged in part-time study. None of the participants received any course credit or reward for participating in the study, and participation was voluntary throughout with the right to withdraw at any time without penalty, in compliance with standard ethical protocols.

Results

A series of structural models was constructed, the first of which is below in Figure 2. The central parameters of the model – that is the connections between first and second order factors – represent regressions from exogenous factors to endogenous factors and act as predictor values. Thus, in this causal model, autonomous learners tend to perceive more rigidity or structure in their courses (β=-0.37, n.s.) than their surface learner counterparts (β=-2.71, n.s.). Further, as autonomous behaviour increases, so according to the beta coefficient, structural perceptions of the course will tend to decrease. This result would be expected, given that autonomous learners impose their own structure and therefore demand less structure from their tutors than surface learners. The strongest contributing measure to the surface factor is the need for precise study instructions (β=0.52, p<0.05). Conversely the strongest item loading onto the autonomy factor is an item relating to the students' need to control the learning process through self-organization of time (β=0.76, p<0.05). This is the basis upon which this model and its companion models are founded. The central parameters will thus be used as predictors of student responses in any given factor context.

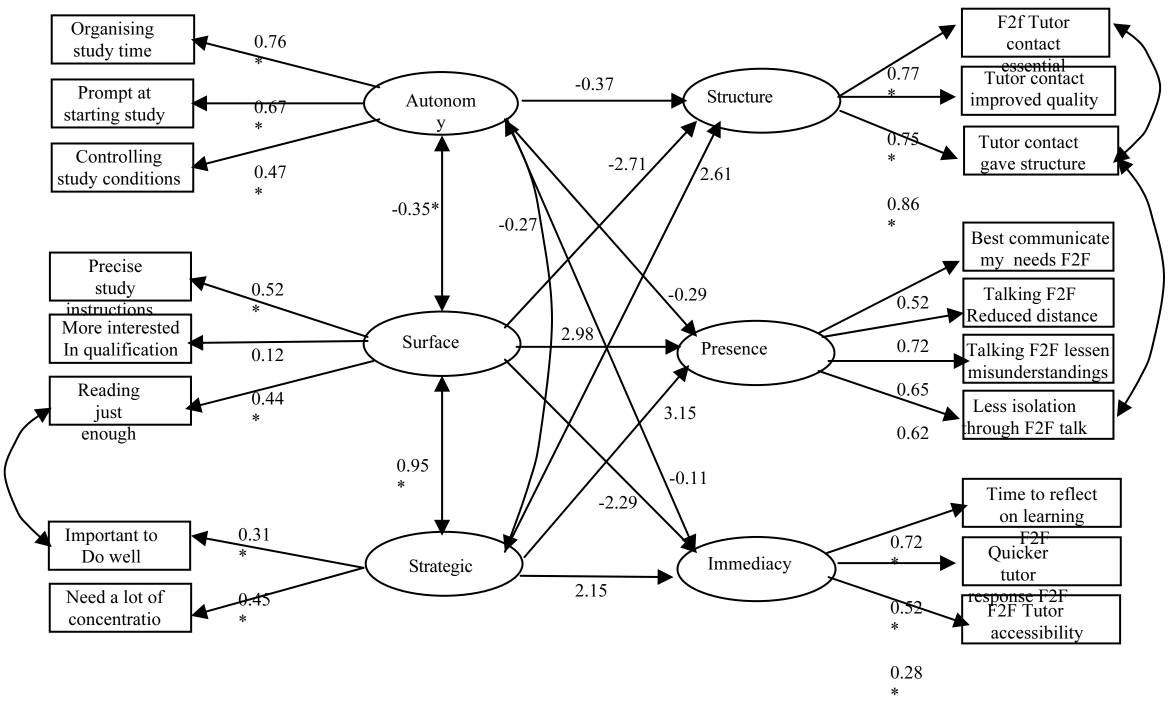

Figure 2. Structural Equation Model (Modality Model: Face to Face)
χ^2 (120)=171.08, p<0.001, CFI=0.92, RMSEA=0.05

Discussion

For specific discussion of the models we shall begin with an exploration of the perception of immediacy in dialogue and to what extent it may contribute toward a clearer understanding of the possible causes and effects of transactional distance.

Immediacy

As previously discussed, immediacy in this study refers to the extent to which students feel they can gain quick access to their tutors, and the perception of how timely they feel their tutors respond to them. Arguably, an investigation of dialogue on its own is insufficient to take all affordances of mediating technologies into account. Immediacy was therefore predicted as an important dialogic characteristic. Immediacy can be established in face to face settings through nodding, smiling and other non-verbal behaviours such as eye contact and gaze. It can also be characterized in paraverbal utterances such as backchannelling and other confirmatory utterances. Such behaviours are often subconsciously managed (Argyle & Dean, 1965), but if they are absent or poorly mediated through the communication medium, students will tend to notice. As a construct, immediacy also seems to at least partially encompass the notion of the student's perception of 'connectedness' to the tutor as mediated through the appropriate telematic technology, although this effect is perhaps better represented as an aspect of social presence. Immediacy has been identified as an important measure of psychological distance, and could therefore be associated with perceived social presence in distance education settings, as proposed by Argyle and Dean (1965). It is likely that a perception of lack of immediacy, resulting in a feeling of reduced social presence may amplify the detrimental effects of transactional distance.

de Kerckhove (1997) opines that immediacy is an artefact of the increased capabilities of communication technologies to facilitate interaction. The ability for example, of a tutor to respond quickly or even 'instantly' to a student's request for help is extremely variable. If perceptions of immediacy can be increased or enhanced using technology mediated communication however, we could surmise that face to face environments might take second place to that technology in the preferences of some students. If this were possible to achieve it would represent the utopian ideal of distance learning actually surpassing the equivalency afforded by face to face learning. Less variable would be the tutor's ability to respond quickly to provide feedback on a student's work, but sending a quick acknowledgement of receipt would still be possible and indeed even desirable (Collis & Moonen, 2002) as a means of establishing some form of immediacy in the mind of the student. Either way, distance learners generally agree that immediacy of responses from their tutors encourages them to keep on track with their studies, and provides them with much needed impetus and motivation to persist in their programme of study. Indeed, timely responses and feedback from tutors may constitute the most significant predictor of distance learner satisfaction (Tallman, 1994).

Immediacy may also have a direct bearing on feelings of intimacy in relationship building between student and tutor. As has been previously highlighted, Gunawardena (1995) has argued that immediacy can convey closeness and 'warmth' (see also Wallace, 1999), whilst lack of immediacy often connotes aloofness or 'coldness', indicating that there is a clear relationship between immediacy and intimacy. Gunawardena and Zittle (1997) also make a clear connection between intimacy and social presence, arguing that it is a measure of the amount of "psychological distance that a communicator puts between him or herself and the object of his/her communication" (ibid. p 9). Gunawardena and Zittle consider that tutors can convey this intimacy as an immediacy of communication through both verbal and non-verbal means, the latter usually through dress codes, facial expressions, and so on. Patently, such non-verbal expressions of immediacy could only be conveyed through communication in face to face mode and to a lesser extent, via video conferenced communication. Short, Williams and Christie show that immediacy can be a feature of either the communications technology itself or the skills and attributes of the communicator (Short, Williams & Christie, 1976), echoing the affordances claims of Whittaker (1996) and colleagues. It is of course entirely possible that immediacy may be an artefact of both the individual's skills and the affordance of the technology. Notwithstanding this discussion, immediacy should be considered an important predictor of student satisfaction, and could also therefore be deemed a key predictor of transactional distance.

It is apparent from the results of the structural equation modeling of the modality hypothesis that out of all the communication modes, e-mail is associated with the greatest perception of immediacy of response from the tutor for autonomous students at $\beta=0.49$, $p=0.00001$ (Table 1). This result runs counter to the modality hypothesis, and is a somewhat surprising finding, because it is the only asynchronous communication modality chosen for analysis within this study. However, if de Kerckhove and others are correct, and technology mediated communication has the capability to enhance communication characteristics such as immediacy, then this finding begins to assume more credence.

Table 1: Summary of Coefficients

Factor Pathway	F2F	Phone	E-Mail	Video
Exogenous (first order) Factor Correlations				
Autonomy/Strategic	-0.27	0.15	-0.09	-0.30
Autonomy/Surface	-0.35*	-0.29	-	-
Autonomy/Structure	-0.37	-0.24	0.32*	0.18*
Regression (β) Coefficients to Endogenous (second order) Factors				
Autonomy/Presence	-0.29	-0.25	0.31*	-0.38
Autonomy/Immediacy	-0.11	-0.14	0.49*	0.20*
Strategic/Surface	0.95*	0.69*	-	-
Strategic/Structure	2.61	0.92*	0.98*	1.02
Strategic/Presence	3.15	1.36	0.92*	-1.00
Strategic/Immediacy	2.15	1.36	0.77*	-0.90
Surface/Structure	-2.71	-0.75*	-	-
Surface/Presence	2.98	-1.45	-	-
Surface/Immediacy	-2.29	-1.26	-	-
χ^2	171.08**	144.27	169.51**	109.48
Df	120	119	127	129
χ^2/df	0.09	1.21	1.33	0.85
RMSEA	0.05	0.05	0.06	0.001
CFI	0.92	0.94	0.93	1.00

* Significant at $p<0.05$ ** significant at $p<0.01$

There is a caveat to this finding, however. This result may be confounded by the inclusion of the ‘time to reflect’ questionnaire item within this factor. Time to reflect is important for many students, particularly those who approach study in a less impulsive manner. Students who need time to reflect may prefer the asynchronous affordance of communication through e-mail when compared to synchronous modes of communication such as the telephone. If we are interested in immediacy of response, then the presence of the ‘time to reflect’ item within the immediacy factor may be a misleading element. Future questionnaire design would need to take into account the possibility that there may be two separate aspects of immediacy that influence a student’s perception of how quickly the tutor responds. It is likely that immediacy of tutor response and the ability to defer immediate response in favour of greater time for reflection are two separate constructs.

These results may also be due to an increased usage of e-mail to communicate in recent times, with the telephone being relegated to second place in the working life of many. Longer, more detailed e-mail messages can be composed and sent, and there is the facility for tutors to program automatic acknowledgements of message receipt into their systems. E-mail use can also be creative, providing users with a rich repertoire of text based expressions, emoticons and other devices with which to communicate (Wheeler & Nistor, 2003). Such variables should be acknowledged in any analysis of this type.

Both the student autonomy ($\beta=0.49$, $z=9.457$, $p=0.00001$) and strategic approaches to study factors ($\beta=0.77$, $z=4.542$, $p=0.00001$) for e-mail mode show statistically significant beta coefficients. These results strongly indicate that students with higher levels of confidence and competency in directing their own study will perceive more immediacy from e-mail communication than their less autonomous counterparts. Further, those who are able to approach their learning in a strategic – that is, in a flexible and versatile – manner, will perceive greater levels of immediacy in e-mail mediated communication. Similarly with students who need more time to contemplate their learning, the findings suggest that students scoring high in personal autonomy tend to see e-mail as offering a more effective facility with which to reflect upon the learning process. They may also view it as a better utility through which to receive valid and more considered tutor responses in comparison to other modes of communication. The affordance of permanency of e-mail messaging through the facility of archiving may advance dialogue between separated tutors and students beyond real-time events for these students.

Strategic learners within the sample may also consider that the use of e-mail provides greater accessibility to the remote tutor than other modes of communication. It is possible that students may even feel that they gain more personal attention from, and enjoy a richer discourse with their tutors via e-mail, with its capacity to be conducted on a one-to-one basis. Moreover, face to face interactions can sometimes be rushed or deferred due to pressure of time, environmental distraction and other constraints on communication. E-mail communication would not be directly affected by these constraints. Further research into these possibilities should be considered as this is perhaps one area in which distance students might regularly benefit over their traditional on-campus counterparts.

It is clear however, that these findings are also entirely dependent on each student's personal experiences with communicating via e-mail. Students receiving quick and timely responses from their tutors by this means could be more predisposed to perceptions of immediacy than those who have experienced longer waits for a tutor response. Another factor worthy of consideration might be the perceived urgency or importance of the message sent by the student to the tutor, in comparison to the actual response time. If students perceive that messages they have sent to their tutors are urgent, yet they receive no response, or they receive a response they consider to be unduly delayed, more remote transactional distance may be experienced than if they perceived their messages to be less urgent.

This can be illustrated in a recent incident in the author's own department. A colleague recently experienced a situation in which an e-mail message from one of his students was erroneously filed and left unanswered for over a week. The student subsequently felt that the tutor was unapproachable and resorted to other means of addressing her problem including a written letter of complaint to the head of department! Transactional distance then could also be a function of the students' perceptions of the urgency or importance of their message, regardless of the media or technology used to mediate the communication process. Asynchronous communication systems such as e-mail should therefore fare less well than synchronous communication systems as a means of conveying urgent messages.

Social Presence

As has already been extensively discussed in previous chapters, the perception of transactional distance is present in all teaching and learning transactions. In particular it has also been claimed that the perception of high levels of transactional distance between the student and tutor has the potential to be detrimental to both the academic and emotional well being of the distance learner (Moore & Kearsley, 1996). One of the aims of this study was to investigate the link between transactional distance and social presence. Similarly to transactional distance, social presence is a perceived aspect of technology mediated communication, and both are hypothesized to have their basis in dialogic processes, so the theoretical basis seems feasible.

As social presence is indicative of feelings of connectedness, students who are less autonomous and therefore more dependent on their tutors should seek higher levels. However, in this sample, a significant finding is observed for autonomous learners. An examination of the results shown in the summary if coefficients in Table 1 reveals that the e-mail communication mode yields the steepest beta coefficient for autonomous learner perceptions of social presence, at a value of $\beta=0.31$, $p<0.05$. This result runs counter to the second part of the modality hypothesis and is statistically significant. It is also a result that concurs with the earlier findings of increased perception of immediacy within e-mail mode. However, one of the lowest levels of social presence experienced by autonomous learners, also running counter to the modality hypothesis, appears to be within the face to face mode, with a negative beta coefficient for the sample, $\beta=-0.29$, $z=-0.377$, $p=0.35$, n.s.

It is possible that the autonomous students in the sample perceived face to face conversation with their tutor to be the poorest in terms of dialogue, thereby engendering a more remote transactional distance. It could be surmised that due to their high levels of autonomous behaviour, such students are more comfortable studying remotely from their tutors, and prefer to communicate in a manner which enables them to maintain a level of control. Locus of control might therefore be considered as another possible predictor of perceptions of transactional distance. E-mail certainly provides such a learner centric affordance in communication. Conversely, surface studiers reported a much lower level of social presence in telephone mode $\beta=-1.45$, n.s., and a much higher level of social presence in face to face mode $\beta=2.98$, n.s. This is a result that would be more in line with expectations, given that surface learners tend to rely more on direct instruction and tutor feedback than their more autonomous peers. Communication over telephone would therefore be less preferable for surface learners than a face to face tutorial. However, these results should be treated with some caution, as the beta coefficients are statistically non-significant.

This result appears to support the earlier finding that immediacy was perceived by the participants to be higher in e-mail communication mode. Although the two are associated, a distinction between immediacy and perceived social presence should perhaps be clarified. Immediacy has already been defined as relating to the learner perception of connectedness and accessibility to the tutor. It also has elements of reflection on learning and is therefore essentially time based. Social presence on the other hand, focuses more on the affordances of the communicating medium, and perceptions that the student is communicating with a real person rather than with a mute technology. Social presence defines the qualitative difference between students being able to communicate their needs from a distance thereby reducing social isolation, as opposed to the ease of accessing tutor support and the gaining of quick response times. We are interested in how dialogue in particular can be used to reduce misunderstandings, provide guidance and generally motivate students to persist in their learning. Characterizing two distinct aspects of dialogue in the form of immediacy and social presence may be helpful to better determine its role as a function of transactional distance.

Structure

Structure has been defined as the extent of the boundaries and constraints imposed upon the student through the way a course is delivered, managed and evaluated. In this context, a course of study can be characterized by the amount of flexibility or rigidity it exhibits. Lower levels of structure were reported by strategic learners in the telephone mode than in other modes ($\beta=0.92$, $z=2.671$, $p=0.003$) with the highest levels of structure being reported in face to face contexts ($\beta=2.61$, $z=1.503$, $p=0.06$, n.s.). Students therefore reported more flexibility in telephone mode than in face to face contact with their tutors. Whilst the face to face result should be treated with caution, the finding of the telephone mode effect is statistically significant and suggests that this mode of communication may impose a lesser level of structure upon strategic distance learners than any of the other modes. This is possibly due to an increase in the dialogue that is inherent in telephone communication. If Moore’s transactional distance theory is correct, out of the three modes of telematic communication the telephone should be the technology that evokes the least transactional distance effects for strategic distance learners due to its greater potential to reduce structure. Telephone mediated dialogue between tutor and student may subvert structure due to its often informal and open ended nature. It should also be noted that the telephone is probably the most easily accessible and most familiar of the three technologies for the majority, if not all of the participants in the sample.

Analysis of communication by e-mail also yielded a statistically significant positive regression ($\beta=0.98$, $p<0.05$) from strategic approaches to structure which suggests that this technology would actually impose greater levels of structure for strategic distance learners. If Moore’s theory is correct, e-mail would actually create a more remote transactional distance for strategic learners than other modes of communication, with the telephone emerging as the technology that is least likely to impose structure.

In the original modality hypothesis, face to face tutorial contact was predicted to evoke the least amount of reported transactional distance, an expectation founded on the basis that the level of dialogue would be richer. If dialogue is richer in face to face communication, then close transactional distance would be experienced whilst if high levels of structure were imposed, remote transactional distance would result. It is clear from an examination of the covariance matrix that the face to face mode is actually one of the most effective modes in imposing structure upon strategic distance learners ($\beta=2.15$, $z=1.484$, $p=0.06$, n.s.). It is also plausible that some autonomous learners in the sample may have been able to subvert the structural effects of the face to face encounter more effectively than in most of the other communication modes ($\beta=-0.37$, $z=-0.602$, $p=0.27$, n.s.). If this is the reason for the negative coefficient, the more autonomous learners may have achieved this by being proactive in instigating more dialogue with their remote tutors, which would have the effect of decreasing structure. However, at this point this is mere conjecture as again, these results were far from conclusive and yielded no statistical significance.

What also remains unresolved is whether the imposed structure of a course of study actually increases transactional distance. Many commentators suggest that this is the case, but there is still some doubt over this effect (Vrasidas & McIsaac, 1999) and there is also a dearth of concerted research into this effect within multiple mode learning environments. It may be beneficial to approach this problem by viewing structure, perception of social presence and immediacy as three separate constructs, each of which seems to contribute to the overall effects of transactional distance. Moore's original configuration of structure and dialogue can remain intact, but with dialogue consisting of at least two sub factors, social presence and immediacy. These are therefore proposed as revised predictors of transactional distance. We plan to undertake future analysis of the issues of remote transactional distance using these new variables.

Conclusion

In conclusion, the key findings from the testing of the testing of our hypothesis that proved to be statistically significant related mainly to autonomous and strategic learners. E-mail seems to provide the highest level of immediacy of dialogue for learners who are proactive and who control their own learning activities ($p=0.00001$). E-mail also provides the greatest amount of social presence for autonomous students ($p<0.05$). However, e-mail is also likely to impose the highest amount of structure on strategic learners, and if this is at the expense of dialogue, then it is likely to create a more remote transactional distance for this type of learner ($p<0.05$). Finally, the telephone tends to impose the least amount of structure on strategic learners ($p<0.05$), which may lessen the transactional distance.

We can conclude from our findings that students experience at least some of the elements of transactional distance when separated from their tutors. Structure can be imposed by communication technologies to varying degrees with telephone appearing to produce the highest level. Dialogue can be mediated through a variety of technologies but e-mail appears for this sample to facilitate the highest levels of immediacy of dialogue, and so should be considered an important communication technology for tutors to develop within any blended learning strategy. The future success of blended learning will rely heavily on the mediation of technology, but even more so on the skills and knowledge of responsive tutors.

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METAPHOR, IMAGE, MODEL AND PROPOSITION FOR DESIGNING AUTONOMOUS LEARNING

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Abstract

An ever-changing and diversified society requires ceaseless learning to maintain high standards of quality in our profession and highly satisfying daily lives. Conventional lecture style instruction is not suitable to accommodate diverse students satisfactorily, especially those from other cultures and those with special needs. Autonomous learning capabilities are highly valued, but their realization depends on motivated participants who have clear plans and perspectives on their learning. The most convenient media for disseminating distance learning are printed materials, but they require special instructional strategies for motivating participants, including a definite framework and procedures for developing high quality guidebooks, textbook and supplemental materials. This paper discusses four stages of design: metaphor, images, models and propositions for implementing instructional technology. Inexpensive devices such as mobile phones and PDA are powerful tools to satisfy the learning needs of anyone, anywhere and at any time: they can effectively complement text materials at low cost. The proposed framework has been applied to large scale classes participated in by from seventy to two hundreds student teachers. New ways of transferring and reconstructing a wide range of forms of knowledge, from tacit to explicit using different types of knowledge representations is discussed.

1. Introduction

Society is changing and diversifying rapidly due to the development of Information and Communication Technology (ICT). Rapid diffusion of ICT accelerates instability of employment and requires everyone to renew professional knowledge and competence, often as his/her own responsibility. The present educational system seems efficient to cultivate manpower for modernizing nations in the economic sense, but is not proving effective to meet personal needs in our turbulent rapidly diversifying society. A new educational system is needed now which will be able to accommodate people who cannot cope with changing and diversifying society. Many senior people working in public education, however, are reluctant or even strongly resistant to reform the educational system so solidly established in the past century. In these circumstances we have to start instructional designs from personal needs and participants' diversified backgrounds and then proceed to put forward national goals and rationales for them, which can be agreed upon in a democratic consensus.

Most present-day educational technology, however, still starts designing instruction from the standpoint of obsolescent educational goals which reflect the old national policies and interests of twenty century modernity. The goal of promoting the right to learn which is most valuable for all citizens, can provide a common ground for designing autonomous learning, but it does not imply any specific method by itself for instructional development. Japanese students and youngsters are often thought ignorant about political and international affairs, but are actually only unfamiliar with the means to express their thought in logical ways. This is the right time to explore learner-centered instruction for cultivating discussion competence among students and for promoting autonomous learning rather than passive compliant approaches to learn. There is much literature discussing instructional development, but almost none of us is persuasive to help us change our limiting metaphors, mental models and frameworks which are so deeply embedded in current instruction. One possibility of changing the rigid frameworks is to use new iconic and figurative representations to express instructional designs. Designing is creative process of imaging learning events and actualizing them in reality. To make this process more flexible and easy to handle, four process layers: metaphor, image, model and proposition, are discussed in the following sections.

2. Instructional technology is a field which must combine various other technologies

When following the conventional procedure of designing instruction, we start from specifying instructional objectives and sequencing them, and then take into account other factors such as teaching materials, teaching environment and teaching tools. In that procedure, instructional objectives are usually derived from the national curriculum specifications, developed down into a sequence of sub-objectives and then actualized in various forms of instructional materials. Instructional technologies come into scene after selecting instructional objectives and their sequential development. On the other hand, when we start from learners' needs and learning objectives, we cannot anticipate the instructional process and final learning outcomes at the beginning of a course. We need to use appropriate technologies and scenarios in order to analyze learners' needs, assess the relevance to instructional contents and develop the learning environment in parallel to evaluation related to educational goals.

Saegusa (1976) suggested, there are two interpretations regarding technology in education. One interpretation is that educational technology is a branch of educational expertise similar to educational philosophy, educational psychology, educational sociology and so on. Another interpretation is that it is an area integrating various technological disciplines similar to brewing technology, food-processing technology, medical technology, nursing technology and many other technologies. The later interpretation gives us a broader view of the role of technology in education. Moreover when we approach instructional design from their perspectives of learners' personal needs, the factors under considerations are too numerous and complex to deal with by simple paper and prescription and conversation. Fortunately, ICT now has become a powerful tool to enable us to deal with such complex problems. It is now applied in almost all disciplines to solve complex problems systematically and to enhance expertise. We can describe the complexity of learners by using a relational database and plan a scheme for future perspectives by adapting simulation technology. In this context, we can borrow ideas from other different kinds of technological expertise to improve education. We take the latter integrative view of instructional technology, and prescribe four activity steps characterized by: 1) metaphors, 2) images, 3) models and 4) propositions in order to create an entirely new instructional process for designing to support autonomous learning.

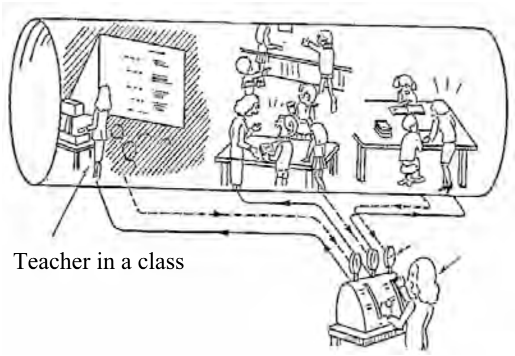
Instructional design is a creating process extending from ambiguous images to concrete procedures, to learning materials and then to tangible outcomes. It is too big a job for lone practitioners; it requires teamwork. And teamwork requires a framework for creating sharable ideas and common outcomes from diversified participants. The use of common metaphors gives a framework to generate sharable images to proceed to more concrete process of developing learning activities. In the project of developing a course 'Introduction to Instructional Technology' for a large class, sometimes attended by more than two hundred students, we fixed two metaphors as a framework, one model called MACETO, several propositions for learning development.

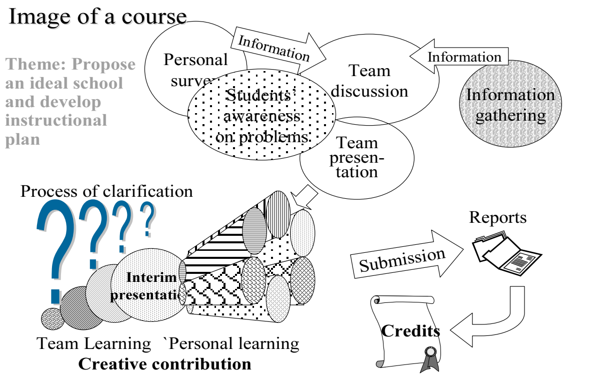
Metaphors

Brewing technology and paragliding technology. Brewing technology depends on biochemical changes in fermentation and paragliding technology bases on the natural laws of aerodynamics and meteorology. These metaphors suggest relatively passive intervention or roles of facilitators for changing the learning process. In spite of such steering seeming passive, it requires very careful attentions on the learning process and scientific knowledge to produce effective outcomes.

Images

Images emerge from the metaphors common to instructional designers. We develop many images as figurative elements for designing a flexible instruction and show here only two of them. Using such metaphors makes it easier to arrive at a consensus among instructional designers, material producers and teachers. One of authors – Nishinosono adopted this approach in the late 1970s at the first time and has developed it since then to clarify the internal structures using a figurative representation (see Figure 1).





(a) Teacher controlling her actions (Nishinosono 1981)

(b) Designing autonomous learning (Nishinosono 2002)

Figure 1. Two images showing gradual transformation of instructional modes

Models

Models represent more actual and relevant aspects of instructions. The most important model for this instructional design is MACETO which represents meaning (M), actions/activities (A), contents (C), environment (E), tools (T) and outcomes (O). This model consists of two parts: internal and external conditions of learner. Instructional design starts from arranging internal conditions of learners to enable students to learn autonomously. Meaning of learning is of high priority and gives an orientation of whole learning activities (see Figure 2).

Hypothesis – If we succeed to arrange internal conditions of learners meaningfully, learners can overcome externally difficult conditions and work hard autonomously.

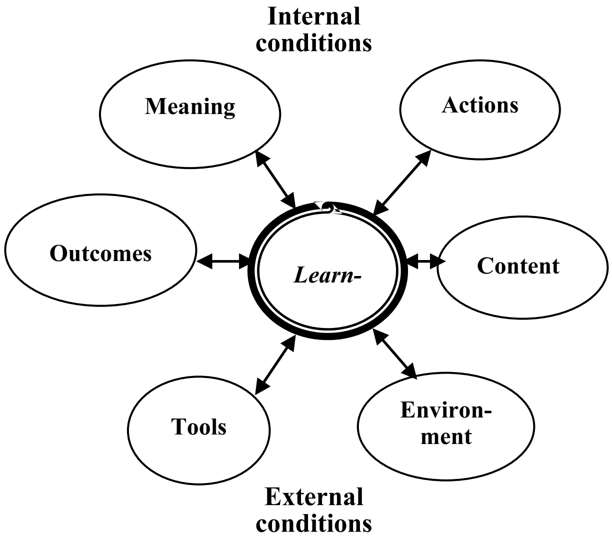


Figure 2. MACETO Model for instructional design

Propositions

Instructional design heavily depends on empirical and tacit knowledge and know-how which is hard to transfer to other instructors through media. To overcome this difficulty, it is indispensable to train instructors to express their experience in form of models and propositions. Five propositions out of 65 emerged from one lesson are listed in Table 1 as examples.

Table 1. Examples of propositions

Some instructional propositions emerged from this project (5 propositions out of 65): – Transformation from image to key concept, graphic presentation and modeling is indispensable but hard to achieve in student teachers with success. Modeling requires a great leap from the previous step. – Realization of autonomous learning requires cultivating the students' heightened attitude towards learning. To cultivate such an attitude, it is effective to require repeatedly the same behavior of filling in the framework sheet (MACETO format) before students can organize learning by themselves. – Alternative strategies of degrees of freedom in learning: 1. When we increase the degree of freedom in learning and give more initiative to the students, learning results in a wide range from excellent to poor in quality and quantity. 2. When we decrease the degree of freedom in learning and give less initiative to the students, learning results in a reliable but mediocre outcome of both less excellent and less poor quality. – To manage a large group of students to learn autonomously, it is effective to form groups and clusters of groups, encourage active participation and let them recognize their responsibility towards autonomous learning. – To make learning meaningful, it is effective to start the lesson from one's earlier experiences relevant to instructional contents.

Norms

Norms are indispensable to maintain effective and collaborative teamwork. Five norms are suggested to team members who are requested to discuss their own choice or addition of new norms. The original norms and logo are shown in Figure 3. Participants are suggested these five norms as an example for further discussion: Autonomy, Collaboration, Contribution, Responsibility and Respect.

The four-stage framework of instructional design and five norms for effective team learning are still at the stage of hypothesis and to be confirmed by further scientific research.

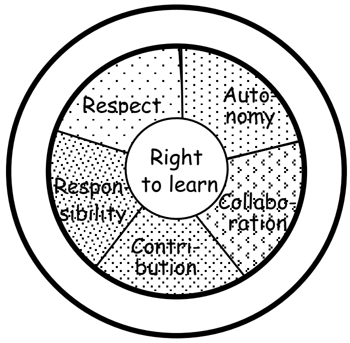


Figure 3. Norms for teamwork

3. Instructional technology as a field of combining various technologies

In the conventional systematic procedure of instructional design, we start by identifying educational goals, specifying instructional objectives, developing a teaching process, implementing the instruction itself and then evaluating outcomes. On the other hand, in the case of starting by identifying learners' needs and motivations, we proceed to clarifying the meaning of learning, assessing learning outcomes, encouraging learning activities, specifying instructional contents and arranging learning environment. Figure 4 shows a framework and procedure for designing learning-oriented instruction which starts from the Right to Learn, according to the learners' various needs and their own learning objectives. The results of following this procedure are active participation in teamwork, reports of more than 10 pages submitted by participants, important elements which are missing from our present educational system practices.

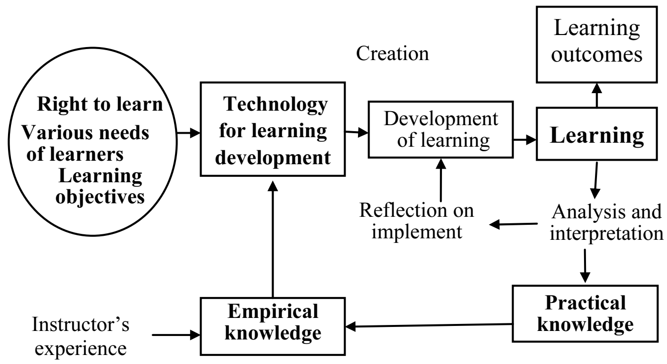


Figure 4. Framework for learning-oriented instruction

Current education in Japanese schools, even in universities, emphasizes the importance of absorbing instructional content, thereby learning towards teaching crammed with factual knowledge. Innovation in school and university education is urgently needed to change education from teacher-led instruction to collaborative student-planned learning to meet the diversified needs of learners and to take advantage of information-rich learning environment provided by our ubiquitous ICT. In this circumstance, teachers are expected to develop their professional expertise, enrich experience and communicate with their colleagues and professionals on the web, even at a distance, to enrich their professional competences. It is indispensable to explore a new type of communication means to promote effective sharing of their experiences. It is indispensable for educational faculties to explore new types of communication means to promote effective sharing of their experiences and collaborative innovation.

Hypothesis – Our experiences with instruction are accumulated tacitly as well as explicitly, of which explicit knowledge can be described in a set of iconic and/or figurative representations and formal propositions to be easily communicated among instructional professionals for enhancing the Right to Learn.

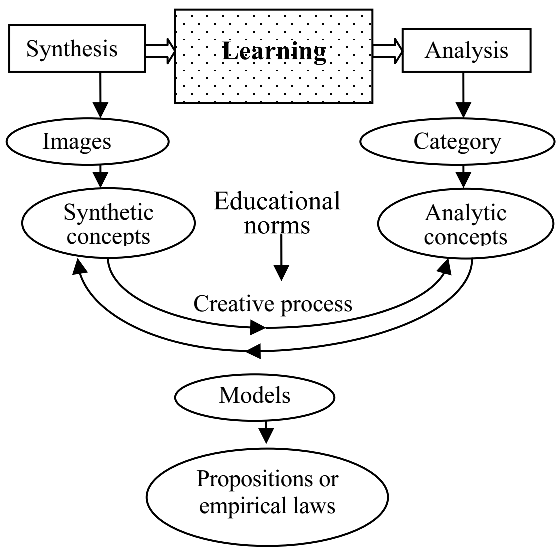


Figure 5. Framework for synthesis and analysis

Effective sharing of experiences on practical instruction requires a common framework to conduct research and report the result among other expertise. Figure 6 shows four possible approaches to designing novel instruction: 1) practical syllogistic derivation from educational norms to actions, 2) application of scientific findings, 3) learning from others' experiences, and 4) use of intuitive and creative ideas enhanced by tacit knowledge, which has accumulated from our previous experience. We start to generate intuitive and creative ideas by referring to the tacit knowledge emerging from our past experience. The concern in this paper is to develop a framework instructional design for a research method for formulating explicit knowledge in the forms of images and iconic representations, as well as statements and propositions.

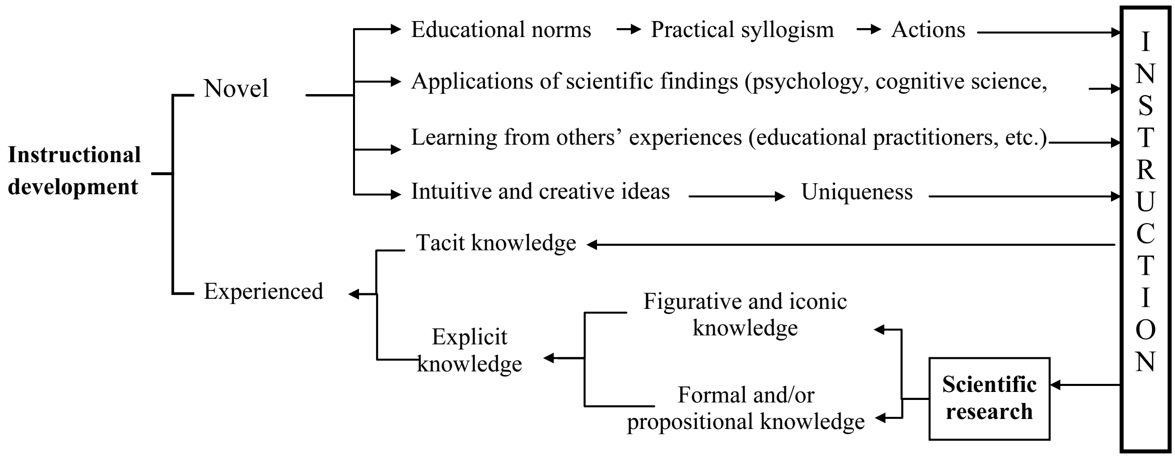


Figure 6. Empirical approaches for learning development

4. Cases of implementation

The first experimental approach for exploring autonomous learning started in 1980s' at Kyoto University of Education where we used it to develop printed materials for guiding micro-teaching as an initial practice of student teachers. The cultivation of autonomous learning was urgently needed to facilitate the effective management of a large number of learning groups. It was entirely empirical procedure used to develop printed materials. The textbook developed then and there is still a valid tool and continued to be used at the university. During the last five years since 1999, we have developed other distributed learning materials synchronized by mobile phones and by ordinary computers through the Web to facilitate mutual communication and discussion among students on bulletin board. In this second trial system, a class can accommodate more than two hundred students aiming to develop large scale on-line learning based on team learning and active involvement in product-oriented teamwork. During this development, the above-mentioned frameworks and procedures have been and are applied and monitored by the authors. Figure 7 shows scenes of a large scale class.

Figure 7. Scenes in a class

5. Conclusions

In the conventional process of planning instruction, educational objectives are always prescribed at first for developing instructional process and materials. Detailed characterization of diverse learners comes later and is not considered definitive for developing the instructional materials. Considering diverse backgrounds of learners, we choose team learning as our strategy to accommodate the diversity and by making all participants get really involved in teamwork they show their different talents and capabilities for collaborating with each other.

This kind of instruction requires highly talented human management and appropriate support technology to implement the needed complex learning. In this study, we adopted concept of 'education as technology' and developed a framework of 'metaphor, image, model and proposition'. To activate team learning, five norms: autonomy, collaboration, contribution, responsibility and respect, are proposed to participants who are free to: accept them, select some of them or add other norms to them. Knowledge obtained from professional experience is described in form of images, iconic representations and propositions which can be currently found among instructional designers on the Web. Images and iconic representations are easy to use to generate new ideas and to modify them after the initial implementation.

In the process of developing educational courses, there are four possible approaches for applying a rational procedure for instructional development; practical syllogistic derivation from educational norms to actions, application of scientific findings, learning from other's experiences and refinement of intuitive and creative ideas. Actual instruction is too complex to manage from a single concept: it is impossible to cover the whole process according to only one specific scientific standpoint. Learning from other designers and practitioners is always very fruitful. At the same time, we often face many entirely unfamiliar situations, but nevertheless have to conduct our instruction. We cannot wait for the needed knowledge to emerge from scientific meetings or information from others' experiences. In many cases in daily teaching, we start from our intuitive ideas and confirm their validity empirically.

As shown in Figure 6, the authors start from the intuitive and creative ideas referring to tacit knowledge hard to express verbally but which is certainly embedded in their own experiences. We may express them in the form of figurative or iconic representations which are easier to grasp and use than strictly logical statements. Young students are quite familiar with expressing their ideas in non-verbal-linguistic ways. Taking advantages of such familiarity, students start expressing their original ideas, discussing the issues and refining them towards final concrete outcomes, or products of instructional materials and iconic models representing the instructional situation. At the beginning they find it difficult to express their ideas in logical statements and propositions needed to communicate with their peers in written form. In this process, ceaseless communication and critiques among students through direct discussion in the class as well as on the Web at home are indispensable to encourage their active involvement and clarify their logical reasoning. This is why we request students to write more than 10 page long reports to express their ideas using a variety of resources.

Mobile phones so familiar to students are still largely out of bounds as educational instruments. However, mobile phones have become an important part of their daily lives. They never forget them at home or anywhere else. On the other hand, instruction of diverse learners has become too difficult to tackle for teachers working alone. They need to help each other, obtain public support and communicate personally with students, colleagues and the citizens in the community. Ubiquitous equipment is a very powerful tool to facilitate mutual and micro-political communication and, in this sense, it can contribute to truly universal education. However, such use of technology requires us to become more imaginative and creative, and to develop accessible scientific procedures in pursuit of rational systematically situated reasoning for instructional development as the core of our professional discipline. Starting from ambiguous but intuitive and creative ideas, we can refine them and express our ideas rationally and then contribute to the scientific development of instructional design technology. Thanks to recent technological developments in qualitative and quantitative analysis, we can easily investigate the validity and relevance of empirical knowledge during real classroom instruction. For this purpose, we need to develop a scientific procedure to clarify our experiences and refine them to be able to communicate with each other around the world.

Aknowlegdements

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LEARNING STYLES IN AN E-MINDMAP

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Abstract

Advanced e-learning technology is available and widespread in our educational institutes, but the discussion on e-learning adoption is still ongoing.

Just publishing learning content on the website is not enough. To find out the optimal presentation of the learning content, taking into account more learning styles, is a challenge for the instructors/authors and will result in increasing e-learning adoption.

E-MINDMAP is a new e-learning concept coming to meet learners' different styles of learning.

1. Problem of the adoption of e-learning solution in life long learning

Designing, developing, and deploying e-learning resources are only part of the e-learning battle. Actually getting employees and prospective students and instructors to use e-learning is a challenge on its own. Generally, when discussing e-learning adoption, it is interesting to see that the technology itself is secondary to the situations and needs of the client or learner. Rarely is the discussion focused exclusively on technology. Most often, the question being asked is "what can I do with this that I cannot do without it". In e-learning, the answer usually centers around access, cost, convenience, and learning effectiveness. Following (http://business.cisco.com) are some discussions from e-learning practice:

- "It takes A LOT of explaining, hand-holding, and demonstrating to convince a low-tech person that the flexibility and convenience of distance ed are worth the trouble of learning a new trick (our average student age is 37!)".
- It's not enough to simply convert classroom materials into HTML files and post them to a Web site. E-learning must also be flexible and offer content choices to account for different learning styles of employees.
- "E-learning must also be compelling, interactive, engaging, and offer feedback options," says Hallett. "In many cases, it means reading less online and providing more audio or video options".
- Any successful e-learning effort must be compelling from the opening sequence, according to Lisa Sass. "We had to make it visually stimulating and engage the senses as much as possible", says Sass. "We wanted to grab them the way a movie trailer grabs them – right at the very beginning – or they would not continue".

2. Different learning styles of learners combined and implemented in an adaptable learning environment

2.1 Learning styles in the e-blended learning process

Just as every person is unique, so is every learner. But how much this uniqueness matters is a great debate among educators, trainers, and psychologists.

A learning style is a student's consistent way of responding to and using stimuli in the context of learning. We can say that each student learns best using a learning strategy or method that best matches his or her need. Or we can say that what matters the most is the learning process, not the style. What is the truth? Till to now, not their learning styles but achieving a solid learning environment that meets the student's need, seems the means for effective learning.

Learning has to be seen as a process and will result in knowledge, being the ability to find new information, the practice of analysing problems and to expand and apply the knowledge in new situations. Learning can be optimised when the instructor cares about the learning styles of the learners.

Following Kolb, in the learning process we differentiate between 4 phases: the sensing or feeling phase, the watching and reflecting phase, the thinking, analysing and having the ability of theoretical reasoning phase and last the doing and experimenting phase.

In planning the learning process the learning strategies or *learner activities* that will assist the learners in mastering the objectives have to be chosen. Many forms of learner activities do exist. Those activities have to support the 4 phases of learning as set forward by Kolb. The selection of them has to be based on a good knowledge of learning and on the potential impact of those learning activities on the quality of learning. Creating a mix of several kinds of learning activities is the main point of the blended learning concept.

Blended learning is the solution in which we can take now full advantage of ICT based learning combined with some traditional classroom activities. E-blended learning is a concept that associates different learning tools to offer a better follow-up, a tailor-made course, matching the needs of the participants and an effective learning process.

2.2 V.A.K. (Visual, Auditory, Kinaesthetic) learning styles and the presentation of learning content as a combination of those 3 learning styles

2.2.1 Introduction

The V.A.K. style is a style that is especially applicable in the presentation of e-learning content for the organisation of a self-paced e-learning course. This combined style is derived from the accelerated learning world and seems to be about the most popular model nowadays. Its main strength is that it is quite simple, which appeals to a lot of people. It uses the three main sensory receivers – Vision, Auditory, and Kinaesthetic (movement) to determine the dominate learning style. Learners use all three to receive information. However, one or more of these receiving styles is normally dominant. This dominant style defines the best way for a person to learn new information by filtering what is to be learned. This style may not always be the same for some tasks. The learner may prefer one style of learning for one task, and a combination of others for another task.

2.2.2 Presentation of learning content using all 3 learning styles

As trainers/authors, it is best to present information using all three styles. This allows all learners, no matter what their preferred style is, the opportunity to become involved. It also allows a learner to be confronted with the other two methods.

2.2.3 What are the characteristics of the three styles? How to present our learning content to fit best to this learning style? What kind of activities can be organised?

Auditory learners may have difficulty with reading and writing tasks. They often do better talking to a colleague or a tape recorder and hearing what was said.

Visual learners can be differentiated into two subchannels – *linguistic* and *spatial*. Learners who are *visual-linguistic* like to learn through written language, such as reading and writing tasks. They like to write down directions and pay better attention to lectures if they watch them. Learners who are *visual-spatial* usually have difficulty with written language and do better with charts, demonstrations, videos, and other visual materials.

Kinaesthetic learners do best while touching and moving. It also has two sub-channels, the kinaesthetic (movement) and the tactile (touch). They tend to lose concentration if there is little or no external stimulation or movement. When listening to lectures they may want to take notes. When reading, they like to scan the material first, and then focus in on the details (get the big picture first).

They typically use color highlighters and take notes by drawing pictures, diagrams, or doodling. In the following table some examples of activities can be found.

	e-learning activity	Other blended learning activity
Auditory learner	In the beginning of the course the new material has been delivered with a brief explanation of what is coming. At the end a summary of what has been covered concludes the course.	Questioning of the learners to draw as much information from them as possible and then fill in the gaps with some own expertise.
		Include auditory activities, such as brainstorming.
		Leaving plenty of time to debrief activities, so the learners can make connections of what they learned and how it applies to their situation.
		An internal dialogue between the teacher and the learners.
Visual learner	Use graphs, charts, illustrations, or other visual aids.	Including plenty of content in handouts to reread after the learning session.
	Include outlines, agendas, handouts, etc. for reading and taking notes.	Leave white space in handouts for note taking.
		Supplement textual information with illustrations whenever possible.
		Have them draw pictures in the margins.
		Show diagrams and then explain them.
Kinaesthetic learner	Use activities that get the learners up and moving.	Give frequent stretch breaks (brain breaks).
	Play music, when appropriate, during activities.	Provide toys such as Koosh balls and Play-Dough to give them something to do with their hands.
	Use colored markers to emphasize key points on flipcharts or white boards.	Provide highlighters, colored pens and/or pencils.
		Have them transfer information from the text to another medium such as a keyboard or a tablet.

2.3 An adaptable learning environment: putting the styles together

First, it should be noted that no single presentation of content or activity supporting a specific learning style, ensures that a learner's needs will be met. It is perhaps more important to build an adaptable learning environment that presents the material in a variety of methods and addressing a combination of more styles, than trying to focus on each learners personal style. The more styles are addressed, the easier the instruction will be, received by the learners.

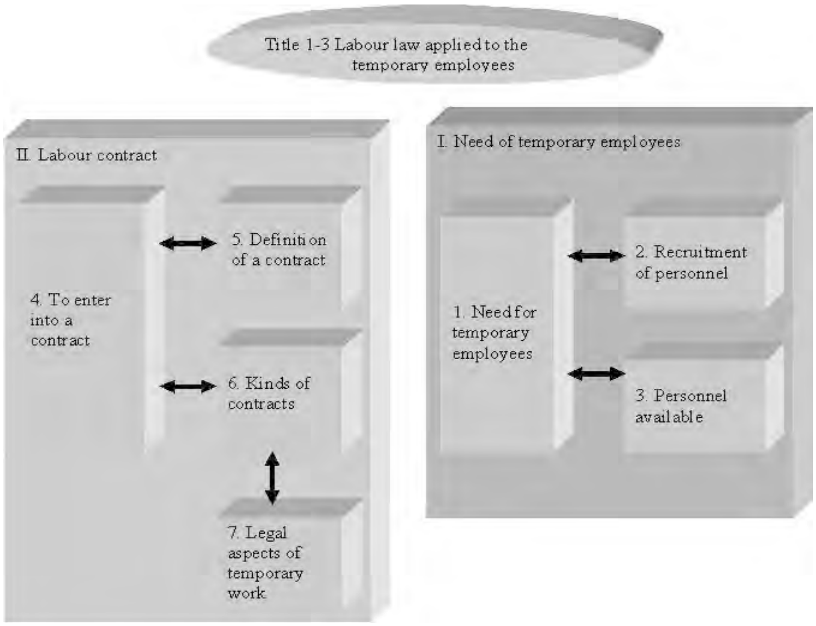
Material presented in a variety of methods keeps the learners interested and reinforces itself. To improve the usability of the content produced, the instructor has to define scenarios or templates with media-rich content synchronizing static or dynamic multimedia assets, such as streaming videos, slides and animations, with textual information and/or powerpoint slides.

New learning objects templates or scenarios are implementing advanced instructional design and learning strategies, taken into account different learning styles of the learners. To improve e-learning effectiveness authors can produce highly interactive and engaging content applying innovative approaches in some designed scenarios.

3. e-MINDMAP is one example of a learning content presentation scenario, taking care of different learning styles of the learners.

3.1 e-MINDMAP

In the e-MINDMAP concept, the learning content will be provided in a graphical way. The e-learning process will be built as a sequence of MINDMAPS. An e-MINDMAP represents a small story of learning content. An e-MINDMAP corresponding to a course module consists of a number of blocks representing learning content elements. The learning process on this level is defined as a sequence of a number of steps, corresponding to those blocks.



The blocks are composed of some atomic learning-elements, being the short text or audio document, the full text, some additional text or graphical presentations, or pictures, some questions and answers, some tests, some mouse-over animations, etc.

3.2 Presentation of learning content as an e-MINDMAP, putting together a number of learning styles

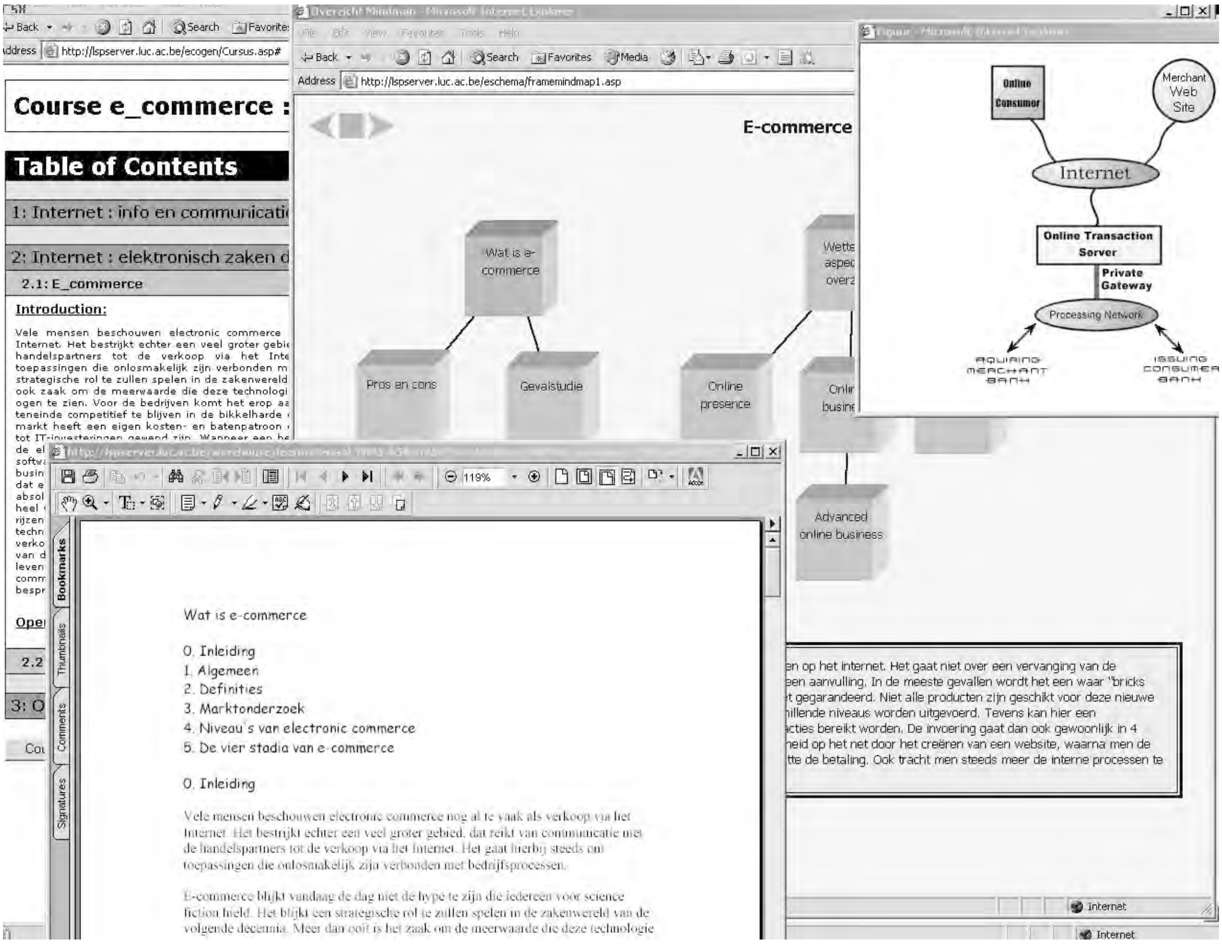
E-learning courses can be built following new and advanced learning concepts taking into account the diversity of learning styles of learners.

The e-learning course (modules) can be presented in a graphical way by adding a graphical presentation shell to the traditional e-learning content modules. Each content component corresponds to a block in an e-MINDMAP, being a composition of a set of blocks. The e-MINDMAP is so telling the story in a sequence of steps. These e-MINDMAP courses are including the traditional e-learning content modules themselves as “full text” atomic learning objects. The e-learning content has been decomposed into a set of smaller content components.

In the e-MINDMAP learning concept the e-learning content has been presented in a way to create the opportunity of fitting different learning styles. The learner can decide on his/her own learning trajectory. On point of the content, the learner can take a first draft reading through the summary and the short texts. Later on he/she can drill down in the detailed content delivered as full text and supplementary content documents.

On point of structure, the learner can follow the sequence as has been set forward by the instructor, or he/she can opt to learn the topics in a different way.

3.3 The e-MINDMAP scenario, combining the V.A.K. learning styles



The blocks of the MINDMAP are structured as independent content components, being the short text or audio document, the full text, some additional text or graphical presentations or pictures, some questions and answers, some tests, some mouse-over animations, etc.

To benefit fully of the advantages of the MINDMAP, it is important for the instructors to try to combine the visual, the auditory and the kinaesthetic components in the e-learning content.

E-MINDMAP can capture the auditory component with for example an audio document. The visual component is obvious since the E-mindmap is a graphical presentation of the content and contains text as well as pictures. The kinaesthetic component can be built in using animations, video fragments, questions and answers.

4. Conclusion

We are evolving to a new and advanced e-learning concept e-MINDMAP. The original “chapter based” content is presented as an e-MINDMAP and is composed of a set of smaller learning content components, the blocks of the e-MINDMAP. E-MINDMAP is a presentation layer over the original html learning content document. Additional presentation content elements have been added to it.

It is preferable that instructors present the content using all the V.A.K. styles.

Our presentation layer model is putting together different learning styles. Research is ongoing on finding the optimal scenario with respect to support more learning styles on the best way. Our MINDMAP presentation layer is a successful one.

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EQUIPPING THE INDIVIDUAL LEARNER FOR LIFELONG E-LEARNING

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Abstract

Learning from e-learning materials is complex, because of the freedom e-learning offers learners to take control of many aspects of their learning. To become fully empowered, lifelong e-learners need not just a range of learning skills, but also an awareness and understanding of the nature of learning and of their own learning styles and processes. Thus, individual differences assume greater significance in e-learning than in more traditional forms of learning. This paper outlines ways in which individual differences in learning style might be implicated in e-learning and how the learning skills needed for lifelong e-learning might be achieved. A progress report is given on a HEFCE-funded project to allow learners to identify and enhance their learning style and thereby enhance their e-learning in ways which will endure. Initial results have shown that a minority of learners find it difficult to learn from e-learning situations, but that enhancement of learning style and hence of becoming a lifelong learner is achievable.

Introduction

Rationale

In this paper we outline why e-learning is different from traditional forms of learning and why the freedom it offers learners to control their learning places more demands on the individual learner. We further outline the concept of meta-learning, which, if achieved, means that a learner will be able to benefit from any form of learning throughout their lifetime. Finally, we describe progress on a project which seeks to promote meta-learning and report the results relevant for lifelong e-learning.

Why e-learning is different

The widespread adoption of e-learning has greatly increased the importance and value for an individual of becoming a lifelong e-learner. E-learning offers new opportunities for learning by creating new and exciting ways to engage students in the learning process. It is well-established that active online engagement strengthens learning (Goodwin *et al.,* 2001) and that traditional forms of learning are much less able to engage learning. As Foreman (2003) says, "even if the lecturer is charismatic, holding the attention of several hundred students for an entire lecture of fifty minutes or longer is impossible" (p.15). Indeed, Forman (2003) believes that the lecture should be abandoned, because more effective teaching tools, such as e-learning, are available.

The particular advantage of e-learning is that it empowers students to control their own learning in terms of when, where and, above all, how they learn. Learners have full freedom to access, sequence and repeat their learning materials within the constraints of their course. However, having making optimal use of this freedom may not be easy and may be beyond the capabilities of many learners. For example, in studies of courses with an e-learning component, 30% of users make no use at all or fail to make proper use of newly developed materials (El Balaa *et al.* (2004); Mash *et al.* (2004). Although little is known of why so many users do not take up excellent e-learning materials, there is growing evidence that learning styles may be implicated.

Learning styles and e-learning

Learning styles are strategies or regular mental behaviours, which are built on an individual's underlying potential and are particularly applicable to deliberate educational learning and especially, therefore, to e-learning. Although there is still disagreement over the nature of learning styles and the importance of particular learning styles, major dimensions of learning style are likely to include:

- Global/holistic versus local/serialistic (e.g. Pask, 1976)
- Deep, strategic and surface (e.g. Entwistle, 1981)
- Visual versus verbal (e.g. Fleming, 2001)

Meta-cognition, meta-learning and lifelong e-learning

Learning can occur on many levels – from simple habituation to abstract reasoning. The skills needed to achieve most of these levels have themselves to be learned. Thus, we need to learn how to learn and, in an ideal world, we need to:

- acquire the full range of learning skills necessary for our purposes;
- have a full appreciation of what it means to learn;
- be aware of and in control of our own learning processes, i.e. we need to be a meta-learner.

Becoming a meta-learner means being fully able to learn and to acquire any new learning skills, which become available and necessary. Thus, a meta-learner is a meta-learner for life. So, just as meta-cognition is an individual's ability to be aware of, think about, consider carefully and apply appropriately their own thought processes, an individual who is high in meta-cognitive abilities is aware of their own learning skills and is able to apply them appropriately. The closer a student is to being a meta-learner, the greater their ability to benefit from the opportunities offered by e-learning.

The CLaSS (Cognitive Learning Strategies for Students) project

For e-learners, however, the curriculum is becoming increasingly diverse with the widespread development of distance and, especially, online learning. The onus is thus typically placed on the learner to adapt, when a mismatch occurs between learning style and learning task (Dewar and Whittington, 2000). Matching and mismatching learning style to instructional materials can have significant effects on learning outcomes (Entwistle, 1981) and, in particular, with online learning (Ford and Chen, 2001). The nature of the student population is also becoming increasingly diverse due to widening participation initiatives. For example, the student population now includes more students with disabilities (HEFCE, 2002), who often have narrower and more rigid learning styles (Farmer and Nesbit, 2000).

As Dewar and Whittington (2000, p.401) put it:

> *"the real power of using learning styles is to provide learners with the appropriate tools and insight to:*
>
> - *explore and identify their preferred approach to learning;*
> - *recognize when a particular experience may not meet their learning style;*
> - *take steps to change the situation to suit their learning style…;*
> - *consciously move out of their comfort zone to develop competence in a variety of learning styles."*

Learning styles are known to develop during a typical undergraduate course (Busato *et al.,* 1998; Severiens *et al.,* 2001) and for web-based learning students' mental models of learning and teaching change during a course (Henderson et al., 2002). However, some learners find adapting their learning style impossible and most find it difficult (Severiens *et al.,* 2001; Smith, 2002; Vermunt and Verloop, 2000). Awareness of learning styles and how they are differentially linked to the different curricular delivery methods would empower students, while ability to adapt their learning style to meet the different demands of the curriculum would further empower them to control, facilitate and enhance their learning. Awareness of the relationship between learning style and teaching would also empower staff.

This paper describes progress on the first two and a half years of a three-year project on learning styles. The aim of the project is to create a learning style resource for students to use as a bridge between themselves and the diverse curriculum, in general, and e-learning, in particular. This resource will allow students to *identify* their own learning style, appreciate where it will be inappropriate and *adapt* and *enhance* it accordingly.

The project is not described fully here, but rather in terms of how individual differences in learning styles impact on e-learning and how such individual differences might be best turned to students' advantage – with a view to making them lifelong e-learners. The rationale for the project derives from the view that, as Klein (2003) puts it, "students' diverse cognitive resources interact with but do not correspond to the categories of curricular representations" (p.45). More specifically, the rationale is that the increasing diversity of the curriculum – and, in particular, those aspects of the curriculum which are delivered via e-learning – has created a need to empower students by raising awareness of learning styles and broadening the range of their learning style.

Method and Results

Identifying learning style

The initial phase of the project was to devise ways of allowing students to identify their own learning styles. 511 students at four universities in England completed a 12-item questionnaire to measure students' attitudes towards learning from individual modules within the first year psychology curriculum. The students then completed a battery of learning style and approaches to study measures. The test battery consisted of 3 measures:

- Approaches and Study Skills Inventory for Students (ASSIST) (Entwistle, 1981)
- Learning Strategies Questionnaire (LSQ) (Warr and Downing, 2000)
- Visual, Aural, Read/write Kinaesthetic (VARK)

After being given extensive feedback about their scores on each of the measures, the students then completed the 12-item questionnaire again, in order to assess whether the feedback on learning style had an influence on students' perceptions of aspects of their curriculum, i.e. whether the feedback had helped them to approach their course more effectively and confidently. Finally, learning style measures were correlated with coursework and examination marks to assess whether particular learning styles facilitated or hindered student assessment.

Correlations between learning style measures and each question in the 12-item questionnaire before and after feedback was given to students about their learning style showed that students had clear views about the most appropriate learning style for each of their core modules and each method of delivering the curriculum (e.g. lectures, seminars, practical classes, etc.). The number of significant correlations found at Time 2 was greater than at Time 1, indicating that the feedback to students had been informative about the most appropriate learning style for a given learning situation and that students had begun to adapt their learning styles to better fit the learning situation.

Some significant correlations were found between subscales within some of the learning style measures and coursework and examination performance. For example, the higher the score on the Visual component of the VARK, the higher the overall assessment score on core psychology modules. Significant positive correlations were also found between some of individual components of assessment and the Visual component of the VARK, while negative correlations were found between the Aural and Kinaesthetic components and individual pieces of coursework.

The most relevant results in an e-learning context were:

- While students had strong preferences for lectures, seminars and lab classes as teaching methods (n=195, 150 and 123, respectively), *only 23 students chose e-learning as their preferred teaching method;*
- When students were asked whether they believed that their learning style was suited to each of 10 teaching methods, the teaching method *least suited to their learning style was web-based learning* – with 191 'No' responses compared to fewer than 100 'No' responses for seminars, lab classes and small group teaching;
- Students were also asked to rate the effectiveness of their learning style for 7 different methods of teaching, one of which was e-learning. *For e-learning more students rated their learning style as 'very ineffective'* and fewer rated it as 'effective' or 'very effective' than for any other teaching method;
- There was some evidence of students changing their learning style in response to feedback and of learning style development between the first and second year of undergraduate courses.

Enhancing learning styles

The project is still in progress. A means has been developed by which students can overcome the mismatches between their learning style and their curriculum by enhancing their learning style. The benefits from being able to do this – based on the theory of cognitive modifiability (Sternberg and Grigorenko, 2002) – are many. For example, a deep approach to studying can produce beneficial effects on academic performance (Norton *et al.,* 1998). Developing a deep approach to learning is generally held to be the end point of *learning style development* and the this phase of the project contains guidance on how to achieve this – and much more, including a brief outline of the more general concept of meta-learning (Briggs, 1985), which might be regarded as the end point of *learning development*. Given the results reported above, this phase of the project is particularly relevant to e-learners and to becoming a lifelong learner.

Discussion

The results from the identification phase of the project show clearly that there is a pressing need to take individual differences into account in e-learning. Although there is much evidence that students use, enjoy and learn from e-learning materials, there is widespread evidence that a substantial minority do not. The data from this project show that e-learning is the least preferred of 10 different modes of teaching. There is also anecdotal evidence that, just as the demands for earlier and faster literacy development are leaving behind a growing minority of children, so the growing sophistication of the medium is leaving behind a growing minority of would-be or have-to-be e-learners.

The data from this project have shown throughout that individual differences in learning style affect learning from all media and that this effect is most pronounced for learning from electronic media. Students perceive their learning style as being least effective for e-learning and least suited to web-based learning. This suggests both that the effects of individual differences in learning style are most pronounced with respect to e-learning and, therefore, that e-learning is the teaching medium where matching learning style to the curriculum requires most attention. However, it is encouraging to note that students had begun to extend their learning styles, after receiving nothing more than basic feedback and prior to the development of the enhancement package.

Results will be reported on the enhancement phase of the project, where it is hoped that the minority of students who fail to use e-learning components of courses will have extended their learning styles and will have acquired a more positive attitude towards e-learning. Results will also be reported about students' progress towards becoming meta-learners.

Regularly updated details of the project can be found under FDTL at:

http://www.uclan.ac.uk/facs/science/psychol/index.htm

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WORK BASED LEARNING: THE ROLE OF ICT IN LEARNING@WORK

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Introduction

This paper is the result of a preparatory analysis into the current 'state of the art' of ICT supported work-based and workplace learning. The aim of this paper is to explore the synthesis between the theories, conceptual frameworks and practices of distance learning, e-learning, work-based learning and workplace learning to identify the role ICT has to play in e-supporting work-based and workplace learning. This will be achieved by first examining the value of the workplace as a learning environment and identifying key texts in the development of the understanding and recognition of the workplace as a practical and valuable learning environment. From here we will then investigate the potential role ICT has in supporting the workplace as a learning environment, identifying some of the issues associated with ICT mediated work-based learning. Finally we will make recommendations for future research into the induction and support of tutors and students preparing for ICT mediated work-based learning.

Learning in the workplace

Workplace learning is now an integral part of the ethos and operational structure of many organisations (BECTA, 2005). Workplace learning encompasses a wide variety of approaches. At one end is a university or a training organisation running a standard course in the workplace using standard teaching methods such as case studies, lectures, simulation exercises and role playing. At the other is what is often known as 'work-based learning', where formal learning outcomes for a university or college are based on development that occurs during or as a consequence of the real work activities that constitute the learner's job role (Boud & Solomon, 2001).

Work-based and workplace learning is not a new phenomenon. It can be argued that learning in the workplace has been overtly happening for centuries through apprenticeships. However, the understanding and recognition of the learning process employed in the workplace and the labelling of 'learning in working life', 'workplace learning' and 'work-based learning' is a relatively new invention.

Organisational and management research has had a strong input in this field. This in part appears to be a reaction to the speeding up of technological change and organisations having to assess and adapt to ever changing global markets, knowledge-based organisation relying heavily on the continual upgrading of knowledge and skills. Widely cited texts on modern learning from the organisational perspective include "Organizational Learning" (Argyris & Schön, 1978), "The Fifth Discipline" (Senge, 1990) and "The Knowledge-Creating Company" (Nonaka & Takeuchi, 1995). The organisational-oriented approach identified in these texts focuses more on developing human capital through the creation of organisational structures and hierarchies than on specific learning initiatives. A more learner-oriented approach which has evolved from a combination of organisational theory and general adult education practice can be found in texts like "Informal and Incidental Learning in the Workplace" (Marsick & Watkins, 1990), "Situated Learning" (Lave & Wenger, 1991) and "Learning in the Workplace" (Billett, 2001).

It is clear from the depth and breadth of research into work-based and workplace learning that it is now accepted that workplaces can and should be settings for practical adult learning and there is a global demand for organisations and individuals to put training high on the agenda. With the continued drive towards lifelong learning, employers and employees not only expect continued personal and professional development through and at the workplace, but now demand it. The concept of a "knowledge based economy" and the "learning society" is one that has been cultivated in various policy documents at both national and European level (EC, 1995; NCIHE, 1997).

The role of ICT

There has been and continues to be a strong argument which promotes ICT as a learning tool with the potential to be a mass educator, reaching all categories of employees in organisations big and small:

> "We see many different examples of how ICT is involved and how ICT is able to contribute to the learning process. From more traditional courses, in which ICT is primarily used for training the employees in relatively limited skills, to new forms of collaborative and project-oriented courses, in which ICT is used as a communicative and collaborative infrastructure for building bridges between the need for learning in the workplace and the theories and methods from the institution, to radical forms of virtual learning environments that are operated by self-directed learners, and which build on motivational structures and dynamics imported from informal learning environments." (Dirckinck-Holmfeld, 2004, p.28)

There is a growing realisation that the focus should move away from "technical tools", towards the "learning processes and the situation and motivation of the learner" (Dirckinck-Holmfeld, ibid). This view is reinforced by various commentators. The European ODL (Open and Distance Learning) Liaison Committee is promoting a new vision of seamlessly embedding ICT into lifelong learning. This new vision puts "context, community, collaboration, competencies, motivation of learners before computer, cost-effectiveness, contents and connectivity" (European ODL Liaison Committee, 2004). This view is reinforced by Illeris *et al.,* who recognise that if ICT supported work-based learning is to be successful "it must be supported by a learning environment and a culture of education that incorporates technology as an integrated element" (Illeris *et al.*, 2004, p.86).

ICT – The mediator

The role of ICT in work-based and workplace learning should therefore not be as an enforcer but as a mediator. As a mediator ICT has the potential to exploit numerous communication mediums which are highly beneficial to workplace learning activities, particularly for the many work-based learners who have been historically excluded from conventional secondary and tertiary education because of poor literacy:

> "ICT is precisely the possibility needed for developing educational material and communication and cooperation systems which in many different ways exploit the possibilities offered by combinations of colour, sound images, speech, dynamic graphics and various degrees of interactivity." (Illeris *et al.,* 2004, p.97)

As a mediator ICT also has the potential to promote and support new learning theories which ideally suit the workplace learning environment. For example, Bandura's "vicarious learning" (Bandura 1986) which has been developed by Mayes *et al.* (2001) relies on technology to capture "learning episodes" which are made available to new learners as a learning material. Mayes *et al.* (2001) state that "we view vicarious learning resources as offering genuinely learner-centred learning materials, providing affective support through increasing the feeling of sharing in a learning community, and a means of more effective immersion into language and practice of students' chosen areas" (p.227).

ICT mediation is not a new phenomenon. Elements of ICT have of course been utilised very successfully in other learning environments (e.g. open, distance, flexible and e-learning). Consequently the value of ICT in tackling a number of common concerns associated with adult education and more specifically work-based and workplace learning has already been addressed.

For example, network learning has promoted the use of online communities and workgroups to address a number of these problem areas. This includes reducing the isolation of the individual learner by providing better 'scaffolding', enhanced peer interaction and reflective practice in a social context through collaborative tasks, mentoring and coaching. Collaborative thinking and creative tools can enable ongoing interaction after the learning event through the creation of sustainable communities of learners. We should be able to use ICT to enable a richer combination of formal and informal learning, group and individual activity, experts and novices. ICT can also record these interactions for quality control.

Preparation for ICT mediated learning

It is apparent that when used appropriately ICT has the potential to be a strong mediator in the delivery of work-based learning. There are of course many factors which need to be considered to make effective use of ICT as a learning tool in the workplace, particularly with the continued move away from content-driven to communication-driven learning. Illeris *et al.* (2004), reflecting on previous studies including Dirckinck-Holmfeld and Fibiger (2002), identified that: (1) the technology must be robust and accessible; (2) the virtual learning space must be designed in such a way that the pedagogical potentials are utilised and adapted to the specific professional conditions; (3) the workplaces must learn to support virtual learning processes; (4) the participants (both teachers and learners) should have the opportunity of developing the basic ICT competences necessary for being able to participate productively in the learning.

While all of these points are potentially equally as important, particular emphasis is now being placed on the induction and preparation of both teachers and learners into ICT mediated learning. Creanor and Walker (2005) have recently conducted several case studies examining how ICT is currently being used to support formal and informal learning in the workplace. Their report makes several recommendations regarding the preparation of learners and teachers including:

- *ICT Skills:* to enable more individual members to access e-learning opportunities, ICT skills training should continue to be a major focus … with a commitment to addressing social exclusion and the digital divide.
- *Training trainers:* identifying the new skills required by online trainers and preparing them for an evolving pedagogical role is an area likely to expand as technologies progress and e-learning options attract a larger number of learners with more diverse profiles. Evidence suggests that training for trainers should mirror the learner experience.
- *New-roles:* as new learning-related roles continue to emerge, appropriate and timely training and support structures will be required. Providing pedagogical and technical support for learners in the workplace has major longterm implications for the expansion of e-learning and will demand innovative approaches.

Finding a synthesis

The development of user focused frameworks and components to provide induction, scaffolding and structured support for tutors and learners which directly address the issues highlighted above, has largely been overlooked within the field of work-based learning. One possible avenue for exploration is the synthesis between the theories, conceptual frameworks and practices of open and distance learning (ODL), e-learning, work-based and workplace learning. By drawing on the wealth of research which has been conducted within these disciplines we believe it is possible to begin integrating this knowledge into a work-based learning context.

Synthesis between these disciplines has already been happening in areas other than induction and support. For example, Cairns and Stephenson's (2002) paper "Online Workplace Learning: Ideas, Issues and a 'Working Example'" draws heavily on Stephenson's own work in e-learning (Stephenson, 2001).

Equally, the issues raised by Bird and Morgan (2003) which are cited as factors in the discontinuance of adults enrolled on distance education are not dissimilar to the factors affecting work-based learners (e.g. conflicting work and family commitments; financial strain; predisposition and readiness for independent learning; and the availability and timeliness of appropriate learning support).

It is not therefore much of a jump to start looking at other resources which address the common themes of learner induction and support. This is particularly true in the area of learner support services, where there has been a recent focus on ‘cognitive’, ‘affective’ and ‘systemic’ components (Tait, 2000), designed to provide structured or ‘scaffolded’ support for learners’ self-direction and interaction, via a continuum comprising orientation, diagnostics, pre-assessment, learning orientation, advising and developing student attitudes, to enhance collaborative interaction.

ODL practitioners have also already produced a number of resources specifically aimed at preparing students for ICT mediated learning (Gilbert, 2001; McVay, 2000; White & Baker, 2003) which are potentially adaptable to a ICT mediated work-based learning environment.

Conclusion and recommendations

It is now accepted that workplaces can and should be settings for practical adult learning. The main benefits of work-based learning are motivation, the relevance to the job performance and transfer of learning. The main drawbacks are the need for personalised support and the complexities of formalising and recognising work-based learning in an academic context. Issues include quality control and the potential isolation of the individual from other learners. ICT mediated learning is now seen as a way of meeting these needs. As we have suggested, the use of online communities and workgroups in particular has the potential to overcome a number of areas.

Many of these approaches are already well established in ODL and conventional (usually campus based) e-learning context, but remain to be fully explored in work-based learning. The underlying aim of future research should therefore be the exploration of the synthesis between the theories, conceptual frameworks and practices of distance learning, e-learning, work-based learning and work placed learning in order to provide the community with practical examples and guidance on the design and implementation of e-supported learning at work. Technology is the thread that ties these perspectives together, and we are reaching the stage where the technology is almost invisible, an accepted ‘given’, in the design of any learning environment in the institution or the workplace.

The focus of future research should not be the technology but the learner, the learner support environment and the institutional and organisational contexts in which they operate; nevertheless it is inevitable that the terminology and concepts of distance and e-learning will be borrowed. This is particularly true in the area of learner support services.

Of course many work-based learners have, through choice or ability, been excluded from conventional secondary and tertiary education and as a consequence may lack some skills such as reflective practice, study skills and basic ICT competence. Consideration also has to be given to the social, cultural and material context in which this support and development occurs. One of the key outcomes of any future research should be the development, localisation and evaluation of a configurable generic induction module and support model for work-based learners.

This is a challenging agenda, but one which must be tackled urgently if we are to develop the concept of the workplace as a supported environment for lifelong learning.

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WORK BASED LEARNING AND ON-LINE TUTORING – AN EXPLORATION OF WORK CONTEXT AND CONTENT ON THE DEVELOPMENT OF ON-LINE TUTORS

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Abstract

The purpose of this paper is to explore the impact of work (as both context and content) on the professional development of on-line tutors. In doing so it seek to define more coherently the nature of work based learning for professionals in this area and to create a better understanding of the specific emerging professional practice of on-line tutors. As a result, the paper seeks to inform professional educators in two ways. Firstly, for those seeking to include work based learning as a component in their educational provision it creates a robust framework within which opportunities for learning in and from work can be assessed. Secondly, for those engaged in supporting on line learning it identifies a number of specific variables which may impact on the development of their own teaching and learning.

Introduction

The educational context for this study is provided by a graduate Diploma level course currently offered by City University in on-line tutoring. This course was first developed in 2001/2 and was aimed at those supporting on-line learning. All the students are existing graduates, primarily they are teachers and trainers, although other educational specialists are included, and their employers include universities, Further Education colleges (vocational colleges) secondary schools, private language schools together with trainers in organisations. In 2005/6 these modules will be offered as part of an MA in E-learning through professional development. The course is delivered through the university's work based learning framework which places a high value not only on the work context of the learners but their ability to use this as part of the personal and professional development. This is reflected in the structure of the programme which relies heavily on learners being able integrate more formal tuition with both their own personal and professional development and their activities at work through the process of reflection (Schon). The negotiated work based learning model was identified for online tutoring because it seek to enables applications of theory to real world situations; it also seeks to bridges theory-practice gap through the development of new professional knowledge. A key part of the programme is the use of reflection in and on practice together with more formal academic research as a means of embedding research into professional practice.

What is work based learning

The term work based learning has a number of meanings which depend largely on the context of the programme in which it occurs. As a result work based learning can be used to describe activities as varied as apprenticeships, internships and work placements as well as the use of learning at work by those in full time employment. In this case it is the last of those descriptions which is being used. Boud (1998), in the search for a new pedagogy, suggests that "work is the curriculum" and Thornton (2004) goes as far as to argue that there is "naturally occurring curriculum of experience" available through work. But what are the components of this curriculum and how is work structured to enable learning. Work can have many meanings and this paper looks at two related but distinct approaches to analysing the work environment – firstly work as content or activity, secondly work context or work role i.e. part of a social system or setting.

Work as content

The idea of job content as a factor within work based learning is comparatively simple. The analysis of job content forms the basis of many human resource processes including those for recruitment and training. Jobs can be said to consist of various activities which can either be identified as discrete sets of tasks [for example through hierarchical task analysis Shepherd (1985) or Kirwan and Ainsworth, (1992)] or as combinations of activities leading to given outcomes (units of competence Jessup (1991) Fletcher (1997)). In both cases the learning opportunity can be defined in terms of a range of available activities. Leaving aside, for a moment, the issue of change, the availability of certain tasks can be said to enable or limit he opportunities for learning through practice. Clearly some work domains are more clearly delineated than others, certain professions have been able to indicate activities in such a way as to define precisely the job/learning requirements for given role. In the case of on-line tutors this level of specificity is not available although the definitions used for learning technologists (Hughes *et al.,* 2004) and that for HE teachers indicate broad areas of activity.

Work as role and relationships

The idea of work as a social role can be seen as an attempt to create coherence across task but also includes by definition the idea of a relationship to others. In terms of learning the idea of the learner as a discrete role is probably best associated with that of the apprentice. Lave and Wenger's study of learning at work focuses on the formal roles assigned to both learner and coach an it is this model which has informed professional development in a number of areas. More recently Fuller and Unwin (2003) have argued that the transfer of expertise in professional areas may not be unidirectional and the idea that the learner can become an expert suggests a more fluid set of social relationships. In the context of this study it is the work role and the perception of the worker as learner and tutor which forms the focus of the investigation.

The nature of the profession

Online tutoring is a relatively new profession that has been growing more rapidly in the past few years. Originally the domain of lone ranger academics working on their own (Stiles and Yorke, 2001), online learning has now moved into the more mainstream of academic activities as Universities sign up to large scale e-learning platforms. Palloff and Pratt note that unfortunately academics are not always involved in the decision making process leading to alienation and problems in adopting new modes of learning:

> Faculty's lack of involvement in decision-making processes that directly affect the way in which online courses will be delivered is widening the rift between faculty and administrators (2001, p12).

Not only is there a need for academics to develop skills in this area, but support staff too are increasingly becoming involved in learner interactions online. Palloff and Pratt are firm advocates of the principle that online learning demands a new skill set for both academic and support staff; "administrators, along with faculty and students, need to be educated about the realities of online teaching" (p.12). To complicate the matter further there is often a misunderstanding about the terms used to describe the new roles of those professionals engaged in supporting online learning. The terms 'instructional designer' or 'learning technologist' are not common currency, particularly in UK HE, and cause confusion amongst staff as to how they should engage with these staff who are ostensibly there to support them. Between institutions this nomenclature can have very different associations and meanings.

A recent consultative paper by Universities UK, SCOP, HEFCE and the HE Academy entitled *Towards a Framework for Professional Teaching Standards* (Universities UK, 2004), attempted to address some of these concerns. Although the report does not mention online learning specifically, it notes that "the boundaries of HE teaching are more blurred than other forms of teaching […] Forms and modes of learning have grown more varied and the teacher/student relationship has become more complex" (p.3). However, in response to this document, the UK Association of Learning Technologists (ALT) expressed concern that this report did not go far enough to address the particular needs of support staff and called for more "attention to those roles vital to the support of learning"

(2004, p.2). Despite the welcome attempt at defining a professional development route for learning and teaching, the consultative paper focused on academic staff, when in reality the advent of e-learning has necessitated the changing of traditional academic roles and the merging of academic and support responsibilities.

Each institution addresses these issues differently and has different responses to the development of materials and content, as outlined by Passmore. Finkelstein and Dryden (1998) refer to the need for co-ordination across departments contrasting this to the limited requirement for such interaction needed to support face to face teaching model. This suggests the existence of a networked professional (both socially and electronically) in the sense that existing teaching staff remain as individuals. Martin Oliver (2003) has written about the move for academics from working at a 'craft' based individual level to part of a team made up of support and other staff. Task level cooperation could thus be seen as a significant aspect of the work of the online tutor and needs the development and encouragement of a particular skill set. Thus, any online tutoring course needs not only to focus on the pedagogic aspects and skill set of teaching online but also of the social changes demanded by this new form of collaborative working and learning. In an attempt to address these needs, the online tutoring course at City takes both a professional and personal approach to learning, by asking the learner to assume the position of both tutor and student at various points in the course and apply what is learnt on a personal level directly to professional practice.

The research

Data has been derived from the course itself and in particular course assessments and evaluation. This is a valid and valuable source of learner reflection and includes accounts of both of individual and collaborative learning (action learning sets). The process of analysis is qualitative and inductive using references to work and seeking to map these onto the domains suggested by the literature. The benefit of such a study lie in the naturalistic approach to data gathering and the implied genuineness of the learner responses, the limitations of this method relate to the absence of specific questioning techniques and the consequent risk of gaps in the data. The sample size is small (N=6) and non-representative in the sense that it represents those on-line tutors who are seeking further development. On the other hand, it is suggested that the sample is possibly more representative of the future as many of those working in this area become interested in professional development.

Findings

Work content

There is extensive evidence that learners had access to a range of relevant work activities and in particular the opportunity to support learners. The context and form of support varied from formal teaching including assessment through to less formal support and encouragement. In addition some learners indicated design and development activities in relation to e-learning at both learning object (materials) level and that of programme course. The idea of range however was modified by a second factor that of control. Learners with responsibility for learning design or management frequently referred to the relationship between this and tutoring which was seen as the social component of learning whereas those without any design responsibility seemed to be constrained (by the design) as to those activities they could perform i.e. only certain types of task were available to them within the designed environment. Task and control or discretion was also raised as a barrier in the context of action learning. One learner commented that

> "My posted problem is a medium term problem where no short term action can be taken. No action can be taken until other outcomes are certain (I also doubt if other set members have any 'action' carried out on their problems)".

Problem specification could thus be limited by both timing (and time scales) but was also constrained by the ability to take action to resolve the problem. This feature of action learning referred to by Smith & O'Neil (2003) is significant since action learning is predicated on both having significant problems and the ability to take action to resolve them. Although not part of any formal specification of duties without the ability to decide and act this component of the programme is unlikely to become little more than an academic exercise based on a dialogue on hypothetical or un-resolvable problems.

A further task related issue was that of the allocation of work time. All the learners expressed concern over the allocation of work time to learning and in some cases the restrictions upon learning from certain activities. Actual work content as task is thus mediated by the ability to undertake actions and is therefore directly affected by issues of autonomy and control. Work content cannot be considered alone as it is inextricably bound up with the social structure of work.

Work context

Not surprisingly, there is no evidence of a formal learner role; in the sense described by Lave and Wenger, the learners are not apprentices nor are they part of a formal training scheme. Nor are there any indications of a formal mentoring process in relation to this area (or these individuals). More significantly there is almost no evidence of informal peer support and, whilst this may be an artefact of the data, the overwhelming impression given is one of isolation both physical (many of the learners operate outside the formal organisation for whom they provide on-line tutoring) and educational. Where social context is referred to as a factor within the learning process, it tends to reflect a barrier. This one learner referred to the perceptions of both students (who she supported) and staff as colleagues the perception acted as a restriction – being seen as a laboratory technician rather than a lecturer was limiting in terms of the perceived legitimacy of her own learning.

At the same time there is significant evidence of the learners providing support to others, this is sometimes a formal responsibility and sometimes emerges from their own perceived expertise. This is much more representative of the relationship identified by Fuller and Unwin (2003) in which the learner role is exchanged for that of a more limited expert. The apprentice model is not therefore supported by the data and this is not entirely surprising as the tutor role would tend to mitigate against a formal learner role. What is not clear is the informal role of the on-line tutor as learner i.e. the extent to which the tutors own learning is recognised and supported within the work environment. There is some evidence of organisational investment – of time and money in the course – but little actual evidence of support to learn or recognition of learning at work.

The broader issues of work context – such as institutional culture have not been included within this study as it largely relates to individual learners, sudden enhancement in status seems to stem from the recognition at an informal level of the expertise being developed.

Discussion

At first glance work content and course content are broadly in congruence and can be seen to support each other. On the other hand the social context of the learner is more problematic. This is evident at both task level – access to tasks – and in terms of the learner role within the workplace – the lack of recognition is an issue. This aspect of social context reflects work undertaken by Billet (2004) on the broader set of social relationships at work.

This recognition of self as both a learner and a provider of learning reflects aspects of Boud and Solomon's study of work based learning in Australia and seems to confirm the suggestion that act of 'naming' or being named a learner is not a pre-requisite to the learning process. On the other hand this lack of formal recognition does indicate the value (or lack of value) placed by the organisation on the learning undertaken and therefore constitutes an important part of the social and political structure within which work and learning exist. At its most favourable this lack of legitimacy can be seen as a simple lack of awareness, when coupled with resource scarcity, however, the problems of workload (referred to above) are more clearly visible. Non legitimate or unrecognised learners are likely to find difficulty accessing key resources such as work time.

The issue of learning context and learning outcomes both illuminated and complicated by the notion of different types or levels of learning (Illeris 2003), suggests that transformative learning requires different social conditions or 'special situations' which are not necessary for accommodative or assimilative learning. We are thus faced with a complex model in which both work situation and pedagogy itself are variables. From the perspective of learning design therefore, we must also take into account the explicit and implicit intentions of the learner – in simple terms whether they are seeking to demonstrate professional competence or undertake personal transformation (or both!).

Conclusions

It must be remembered that this is an early exploratory study with a relatively small sample operating in a specific context. More detailed and focused research is necessary to explore more fully the contours of the work environment perhaps using Boud and Solomon's example of discourse analysis (2004). On the other hand what does emerge is a snapshot picture of learning at work which can be used to inform the design of future course educational provision in a number of ways.

For the learner there is the recognition that work based learning not is naturalistic but complex and deliberately structured. The social and epistemological structure of the workplace is the result of competing intentions in which learning itself may well be a low priority. There is thus a need to understanding the competing roles of learner and worker and to be able to plan and manage their learning within a complex an sometimes hostile environment.

For the provider there is the recognition that the emergent role of the on-line tutor requires different levels of support and, should the projected outcome be the development of shared practice, the provision for practice to be shared and reflected on within and between organisations. In addition to the provision of personal support there is also a recognition that the development of wok process knowledge requires the development of mechanisms to integrate work based learning across organisations. To this extent providers of work based learning must seek to engage not only with the individual learners but also the context in which they work.

This final theme raises the issue of employer involvement and the need for providers to develop a clearer understanding of the possibilities for partnership and, potentially at least, the opportunity for them to influence work practice in order to extend the opportunity for learning.

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INCREASING THE OPENNESS OF UNIVERSITIES IN LIFELONG LEARNING:
ACADEMIC TRAINING NEEDS IN EUROPEAN SMES

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1. State of the Art: SMEs training needs and HEIs practices

This paper focuses on the academic training and learning needs of European companies. It especially highlights the increasing usage of distance and technology-enhanced learning scenarios, which will be subsumed under the term e-learning in this paper. In particular the demand for effective and even efficient, ad-hoc, anytime and everywhere available, high-quality training and learning scenarios substantial influences the development of the market for providers of e-learning services – especially in the context of the transition to the knowledge society. Furthermore so called life-long learning approaches are potentially integrating tailored, mass customized content and different learning services from heterogeneous content and learning-service suppliers. Through its underlying flexibility e-learning it is seen as a tool for school, university, and vocational training arrangements and therewith as an important enabler for lifelong learning.

Additionally there is a growing demand for academic and scientific content and learning services. Whereas large corporations and companies are establishing their own learning centres and corporate universities for teaching and learning academic offers, the situation for micro, small and medium-sized enterprises (SMEs), that do not have the resources to set off their own departments for intra-company vocational or further education, is cannot be recorded as satisfactory. Indeed there are isolated approaches by private universities to offer their services and academic/scientific content/knowledge also to SMEs. This is usually driven by private business schools and, in most cases, by organizations from the United States. Nevertheless there are still no central contact points, nor are there systematic approaches to bridge the gap between most higher education institutions and the corporate world, especially in terms of vocational e-learning transaction. Even so it is obvious that there is only rough knowledge available about the current training needs of SMEs. Furthermore the uptake of e-learning and the usage of technology-enhanced learning services in SMEs seem to be very slow, while the adoption in large companies is sophisticated. To close this gap it seems necessary to identify the needs of academic training in European SMEs and to analyze the current practices of European Higher Education Institutions (HEIs).

This paper aims to provide a first insight to current academic and scientific training needs and activities in European SMEs and HEIs, both with a special focus on e-learning and technology-enhanced learning activities. The following chapters highlight the central results of a survey done in different European countries (Austria, France, Germany, and Greece) within the **eduXchange** project from March until September 2004. About 25 interviews were conducted involving key players and experts from public and private sectors, e.g. companies, labour associations and professional confederations. These empirical results are supported by massive desk research activities also done in 2004. The relevant results regarding the training needs in SMEs are shown first, followed by an analysis of the current practices of European Higher Education Institutions.

2. Academic training and learning needs in European SMEs

Micro, small and medium sized enterprises play a central role in the European Economy. In every country they are seen as important innovators, employers and social integrators. According to the European policy terms, SMEs are divided into micro, small, and medium-sized companies. Together they are defined as companies employing 1 to 250 people. It is now obvious that there are significant differences in the field of e-learning adoption between companies employing 50-100 persons and enterprises with 100-250 employees. Besides the above mentioned definition several designations exist in the various European countries. In Austria SMEs count 99.5% of all businesses with about 1.5 million employees working in these companies (KMU Forschung Austria 2003). About 40% of Greek companies are single-person companies and 99.5% of the companies employ up to 9 individuals.

The emerging knowledge society requires a permanent updating of nearly every skill and competence. For most companies, large-scaled ones as well as SMEs, the up-to-date knowledge of their employees is crucial for their overall success. Furthermore an increasing demand for high-qualified, academically educated employees and the fast transfer of scientific results into marketable products and services is a key success factor for companies of that size. The precise assessment of SMEs using e-learning indeed proves to be extremely complex for three reasons. As *Atwell* (Attwell 2003) explains, it is first very hard to evaluate the number of SMEs using e-learning because of their spread. Second, as shown above it is difficult to choose a definition of an SME. Finally, it is difficult to define e-learning in the framework of SMEs. Most of them make a great use of digital media (CD-ROMs, Web sites), but they do not consider that they are using e-learning. These media are only tools used for work and they are not seen as means to improve competency. Below preliminary results from several surveys and desk research are shown for Austrian, French, German and Greek SMEs.

According to a study of Statistik Austria done in 2001, 72% of all **Austrian companies** with more than 10 employees had some participation in education and training activities in 1999. Whereas 91.1% of medium sized companies were active in training, only 74.8% of small sized companies with 20 to 49 employees and only 63.4% of companies with 10 to 19 employees had some training activities. The smaller the enterprise is the fewer are the training activities. Those SMEs that have no training or educational activities stated that existing skills are satisfactory, that the employees are too busy for additional training activities and that training activities are too expensive. Medium sized companies also mentioned that vocational training is sufficient for the companies' needs. The reason given most often was that the existing skills of employees were satisfactory. From the e-learning point-of-view the most interesting reason are the costs of training activities as a reason for not having training activities. This means that if companies were able to reduce costs for training by using e-learning, the percentage of companies that provide training to their employees would rise. Smaller companies spend less on training courses than medium ones. While the small ones spend approx. 255 Euros per employee medium sized companies spend an average of 350 Euros per employee and year. Smaller companies prefer cheaper courses and solutions that cost less, usually an off-the-shelf solution would be chosen as the most suitable. As a result, e-learning should be as cost saving as possible. Nevertheless there is still a lack of e-learning products that consider the needs of SMEs.

Usually e-learning courses aim at large businesses. As a consequence the suppliers of e-learning courses do not see SMEs as a specific target group. SMEs indentify e-learning as a tool for training that reduces costs, maintains consistency of teaching and keeps the staff up-to-date (EIU 2003). Furthermore they expect to save time, to get more flexibility and that the place and time of the training activities is up to the individual. Another requirement for the use of e-learning courses by SMEs is a higher transparency of the market of e-learning courses. As a consequence, there is the wish for a catalogue of e-learning suppliers or certificates for high-quality courses. Addressing the need to reduce training costs, SMEs prefer standardized courses. Corresponding to these demands, co-operations between SMEs with similar requirements and/or platform or knowledge-pool containing course content where they can easily compose their training programmes could prove to be a solution. At the moment it seems mandatory that the potential suitable solution would have to be simple and not require state-of-the-art technology.

Among the increasing number of companies using e-learning in **France**, SMEs are more and more numerous. But their proportion in using e-learning is still inferior to their share in the companies' population. Few SMEs already use e-learning, but their number is growing. This evolution can be explained by two main factors. They are always increasingly connected to the Internet, and they are targeted by several public or private policies aimed at improving their usage of e-learning. Companies which already own a large number of personal computers and similar IT hardware are more inclined to use e-learning: investment in hardware and tools has already been initiated and there is a clear training need for them to address. Moreover, SMEs which are located in technological centres, close to higher education institutions, universities and research centres benefit from this environment. Companies using e-learning are often the most involved in technological issues. In the same way, the employees who are most inclined to use e-learning are 'white collars'. They already have the technical infrastructure and their interest matches the current offers in content. E-learning is still used predominantly for training in specific fields. As far as these categories are concerned, the subjects currently covered by e-training in SMEs containt no specific adaptation to their needs and are tailored made for larger companies, a fact that is considered as a problem for some employees, and for the SME companies that they work for. The current offer from higher education institutions is not focused on SMEs. The offer is either very academic or very high level content which, again, is not adapted to SMEs.

The situation in **Greece** is characterized by the high importance of SMEs. 40 percent of Greek companies are single-person companies and 99.5% of the companies employ up to 9 individuals (micro companies). Regarding this, nearly every company in Greece can be classified as an SME. Less than 30 percent of these SMEs have reached a good position regarding the usage of modern information and communication technologies (ICT). This is one of the most fundamental hindering factors since reaching out e-learning offers has as a starting point the availability of the necessary hardware and infrastructure in the side of the learning consumer. Nevertheless a high growing rate of the number of companies adopting ICT equipment was more than 40% in 2003 (GRNET 2003). Problems for them are the lack of knowledge on how ICT can help their businesses, the lack of financial resources for supporting basic ICT-infrastructure and the lack of expertise of their employees (e.g. technological skills).

Regarding the situation in **German SMEs,** different studies and papers show that especially in the field of education and the usage of learning services there is a gap between large-scale enterprises and SMEs. In 2002, the large scaled companies in Germany spent 12.5% of their overall budget for education in e-learning, whereas in the German SMEs e-learning is used only sporadic (Reglin, Severing 2003). First this was traced back to a bad technical infrastructure. But at closer inspection current studies show that after their initial indecision in the 1990s, the German SMEs have reached a good position regarding the usage of modern ICT in the meantime. Furthermore interviews in 2002 have shown that more than 90 percent of them use the Internet and that already 14% of their turnovers are achieved through this channel. Another survey in 2002 with 800 participants from German SMEs has shown that there is a large gap between the usage of computer workplaces and the usage of ICT-based learning programs. The study illustrates that 96% of the interviewed SMEs are using computer workplaces, while only 5 percent of them are using e-learning (Reglin, Severing 2003, and Michel, Goertz 2004). These studies also point out significant differences regarding the acceptance and the potential usage of e-learning in the future: more than 50 percent of the interviewed partners do not like to establish e-learning scenarios in their SME in the future (Reglin, Severing 2003). Nevertheless, an ongoing problem in many German SMEs is their growing demand for qualified employees and/or the lack of target-oriented opportunities to educate their employees. This might be a chance for providers of educational services, traditional face-to-face education and training as well as blended and e-learning scenarios and offers, to achieve other and/or higher revenues from SMEs.

At the moment the main focus of the German market for professional training is on large companies, nevertheless there are chances to meet the needs of small and medium-sized companies in Germany too. Therefore, the potential providers/brokers can use established channels of distribution (e.g. by cooperating with institutions like the CIC) as well as establish new organizations for brokering content and/or services in the field of professional training. The well completed ICT-infrastructure in German SMEs can favour the usage of blended learning and e-learning scenarios. An important step to reach this goal is to develop a business framework about the transfer of academic content between Higher Education Institutes and small/medium enterprises on a brokerage platform. The success of this intention is linked with the right estimation of the SMEs' needs in professional training and the arrangement of a compatible offer. The role of the German Chamber of Industry and Commerce (CIC) is substantial in that regard. Because of their public task they have got a well-developed link to SMEs and they can deduce the needs of the SMEs. For potential or still existing brokering instances it is important to use this specific benefit of the CICs and to integrate them into the process of producing goods and services in the field of professional training.

3. Current practices in European HEIs

Universities from the public as well as from the private sector are seen as the most important providers of academic and scientific knowledge, content and learning services. Furthermore they have gained knowledge in producing high-qualitative e-learning services and offers, e.g. in national research projects. In any case it is obvious that European HEIs do not have a strong market position in the field of vocational training. Currently, Austrian and German HEIs are not important training suppliers for SMEs, for example. The knowledge of HEIs is seen either as too theoretical or as too expensive. At this time neither e-learning providers nor businesses can imagine HEIs to be relevant in the European or in the national e-learning market(s) in the near future. Traditionally training for businesses is not carried out by universities but by various chambers of commerce or by private institutes. Therefore an implementation of a platform where e-learning content for businesses is offered by HEIs could be challenging. In Greece a promising but very limited number of HEIs' initiatives providing vocational training have been identified. A significant hindering factor for a large scale implementation of such models is the absence of a legal framework to encourage the collaboration of universities and corporations in vocational training and in knowledge exchange. It is promising though that the companies tend to have a positive approach to the delivery of content from universities but the adaptation to their specific needs is still an open issue.

The most active institutions actually involved in SME training are vocational training centers. Even if they are not exactly HEIs, they are the institutions which channel the largest volume of contents to companies and to SMEs. These centres are either commercial or state-supported and they are usually linked to public services for education or for employment. They offer internships, evening classes, modules and short training. Currently they offer very limited e-learning services.

4. General outcomes and trends

A fortiori it should be obvious that the market for academic content and learning services is still under way, especially the market for e-learning and technology-enhanced learning materials and services cannot be considered as mature and is still of limited size today. Given the limited number of interviews and the limited size of the eduXchange project the results can give a first, but still valid outline. From a scientific point of view further research has to be done especially on East and North European Countries to complete the first results. But several factors which may influence the development of the market for an adequate exchange of academic knowledge, content and learning services were identified. These may influence the development in the academic sector as well as in the business sector. Furthermore they are considered as fundamental in creating the appropriate platform and organization for a successful deployment within public and private organizations. An important finding is that there are several new locally based initiatives all over Europe which try to prepare the landscape for new working and learning patterns, company structures, and learning experiences. While HEIs currently do not offer appropriate and specific contents to SMEs or possibilities to work together in a systematic way; some companies have decided to develop such offers. There are still some platforms or web sites especially for SME training.

Regarding this situation it seems, that an adequate business and organizational model for facilitating the transfer and the application of academic on both sides is needed. While different projects have analyzed the technological basis (e.g. brokerage platforms in the Ten-A-project) for such services, there is still a gap, regarding the organization of such a service and the integration of the different partners from the academic and from the corporate side. To analyze the potential and the opportunities for such a service is the goal of the **eduXchange** project. EduXchange aims at preparing the ground for a sustainable business framework by providing a viable business model, together with an implementation roadmap, based on a PPP/PPN scheme for a European brokerage service, specifically devised for the retrieval and transfer of knowledge generated in an academic context for corporate training and learning needs. The project consortium consists of partners from industry, the public sector, and higher education institutions from Austria, France, Germany, and Greece.

Especially from a European or even global perspective the borderless and independent of time exchange of learning contents and services is important, nevertheless it is also of importance to strengthen the exchange of knowledge between locally or regionally residing HEIs and SMEs. While the exchange of standardized services as well as basic learning arrangements and offers can be fulfilled from a European platform, the efficient exchange of knowledge and the collaboration between individual companies and HEIs may be established locally or regionally in a better way. It is possible to abstract from the accumulated experiences, that SMEs choose a pragmatically and a problem solving approach when they initiated professional training for their staff. To conquer potential market resistance it is a must to design the educational content with a customer focus.

Regarding the market of e-learning content and e-learning services *Attwell* has identified six important issues: "a missing training culture in SMEs; e-learning divide between white and blue-collar workers; poor content; linguistic issues; costs; and missing support structures" (Attwell 2003). One possibility to develop and to market an attractive portfolio is a modular structure of professional training offers. Employees have got the opportunity to satisfy their knowledge needs and they can choose between specific courses or they can additionally take other courses as well. To design the content and the application of e-learning media it is very important to consider the target customers and the users of professional training. The affinity to operate with new media and to use it for professional training is less developed by older employees, analogous to the educational level. Beside this it seems also important to integrate other intermediaries, e.g. Trade Unions. The following table highlights the current HEIs' offers and the SMEs' needs.

Table 1: Current HEI offer and SME needs

Current HEI Offer	SME needs
Theoretical contents	Practical issues
Courses focused on employers and managers	Content for all employees whatever are theirs function(s)
Long and specialized content	Short pieces of content Cross topic
Non alterable content Protected by intellectual property	Alterable content Adaptable to daily life and problems of SMEs
Expensive platforms New technologies (video conference…)	Cheap software Content usable on existing tools
Scheduled training Long time for implement tools	Just-in-time learning Quickly usable
Mixed Training Seminars	Blended Training On-line or on the job coaching

Regarding these issues, a conclusion can be that currently SMEs are using contents which are not really intended for them, and they agree they are often not quite adapted. There are several reasons for that. First there is a serious problem with the language used. Often the contents are in English whereas in the SMEs people are not very well at ease with foreign languages. The employees would like to have materials in their mother tongue. There is also a lack of educational multimedia content coming from institutional, professional and industrial sources in education, at least in Europe (reports on the seminary): no specified topics, not adapted to the SMEs needs and means. But there are some exceptions. The University of Greenwich for instance has an e-learning strategy: 'The e-University of

Greenwich'. It deals with a project of very specialized content: the Biopharm project, with mixed delivery training courses for local pharmaceutical and biotechnology companies. This content is intended specially for the local companies taking into account their background. SMEs cannot implement such solutions and lose the main utility of e-learning. The current contents in training centres and on the Internet are mostly not suitable for SMEs' needs. Further problems are the cost of e-learning materials and solutions. The last two points give us an idea of what must be created for SMEs' e-training as far as the content is concerned. First it is of little use to create content about software, management and languages in a global way, because they already exist from many vendors. Additionally, the new content will have to overcome the mentioned difficulties: language, graduation, cost and flexibility and to have an added value specific for SMEs.

The three major findings in this paper are: first there is a gap in the policy for the exchange of knowledge and learning content/services. This should be closed by an adequate legal, organizational, and technological framework is needed, accompanied by a business model for the U2C-exchange. Second, it is important to identify the training needs in SMEs and the possibilities of Europes' universities to offer vocational training to SMEs, therefore possibilities for a systematic exchange of knowledge and Public Private Partnership/Public Private Network-approaches can act as an organizational basis. The third finding is that the adaptation and the (mass) customization of the training offers are necessary.

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LIFELONG LEARNING, e-LEARNING AND BUSINESS DEVELOPMENT IN SMALL AND MEDIUM ENTERPRISES

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1. Introduction

With the 21st century many new challenges for enterprises and employees arise as well as for society as a whole. Markets globalise, new information and communication technologies speed up trade flows, customer requirements become more complex and individualised. In this context businesses have to adapt to new requirements and customer concerns more quickly as well as new work relations and organisational forms have to be developed. The basis for new competitive strategies is the ability of enterprises to identify key skills particularly for their business and to encourage their development for all employees. The term ‘lifelong learning’ refers to these challenges and it calls attention to the fact that learning is and will be a process that doesn’t stop with a diploma. Companies are forced to develop their human resources permanently. These are some major challenges of lifelong learning and all enterprises should increase their investment in this process.

The Expert Commission for “Financing Lifelong Learning” set up by the German Federal Ministry of Education and Research shows that this requirement “arises from three objectives: (1) stimulating economic growth and improving competitiveness; (2) promoting employability of individuals and (3) strengthening social cohesion” (Bosch, Januar 2005).

Life long learning and the acquisition of knowledge for work tasks which have to be organised within small and medium enterprises (SMEs) is more complex than the provision of access to courses and traditional learning opportunities. It presupposes communication or direct face-to-face contact between individuals, needs instructors, pupils, places – and most important: time for learning and understanding. E-Learning which offers many benefits within the process of lifelong learning especially in the small and medium companies must be firmly embedded with the idea of lifelong learning.

In addition e-Learning supports the achievement of the Lisbon objectives “by facilitating knowledge and skills acquisition, by providing flexible learning opportunities for students and citizens, personalising learning and by creating new collaborative learning opportunities. E-learning is an efficient and cost effective tool for fostering workforce development, it can lead to cost savings through better utilisation of a users time, efficiencies in personnel resources in institutions providing education and training as well as reductions in physical requirements” (E-Learning Industry Group eLIG).

Therefore it was expected that e-Learning would increase its share in companies training activities. But performance and reputation of e-Learning have not lived up to the lofty expectations set by the early realization of the enormous potential benefits of this marriage of learning and technology. For example, in 2000 the American Society for Training and Development (ASTD) prognosticated optimistically that the world of vocational training would change within 1000 days making the transition to the e-Learning age. But the reality in companies shows another picture. In the last years it seems that the quality standards of the e-Learning products are likely to decline and the use of e-Learning decreases. One problem could be the (non) human factor. Initially, e-Learning was seen mostly from the administrator’s perspective, not from the student’s point of view and interests. E-Learning solutions tend to be seen as an opportunity to cut costs by automating the learning process, cutting out staff by going directly to the learner, reducing inventories of books and reducing building requirements.

But results of some projects in this field and experiences of Business Advisors involved in developing a training needs analysis in SMEs show that often when a skill is identified in a SME and a recommendation is made to improve this deficit the company is reluctant to commit its staff to training even when there might be a commercial advantage to be gained or there might to be zero cost to the company concerned.

In this paper after a short presentation of the situation of skills development in SMEs and reasons why these companies do not apply e-Learning to support lifelong learning (part 2) in this context, results of some projects like the ongoing European project ARIEL are given (part 3).

2. SMEs, lifelong learning and e-Learning

The important role of the private sector for economic and social development of all economies is known. SMEs are universally acknowledged as 'engines of growth', and they generate more employment opportunities at the lowest cost per new employment. But SMEs, have now come under severe pressure in many countries as they lack required capabilities to be able to take advantage of new opportunities opening up before them as a result of the globalization process and to remain national/international competitive.

SMEs have a couple of specific organisational needs and characteristics: these companies have a dependence on a limited number of people (often owners and managers are one and the same person) and there is almost always, a close relationship to customers and business partners. If they do not acquire, maintain or improve their business skills continuously, their competitors will benefit and business will move elsewhere. The impact on the workplace and the business while staff is absent on training, cannot be under-estimated, given that there are over 18 million individual enterprises in the EU, of which over 99 per cent fall within the definition of SMEs.

The European Bord of Life Long Learning CEC found that lifelong development of skills including business know-how depends on implementing the following measures:

- Identification and anticipation of skills and qualification needs.
- Recognition and validation of skills and qualifications.
- Procuring of information, support and guidance.
- Finding resources.

The identification of skills and qualification needs should take place both: at the enterprise level and at national/sectoral level. In the last case the collective analysis of skills needs and of the development of vocational or professional qualification is a priority referring to young people in the context of their career guidance and integration into working life. It is also important to employees in the management of their careers and their capacity to remain in employment, to job-seekers and to companies in terms of their competitiveness (CEC, 2004). In enterprises the process of identifying skills and qualification needs should become a main axis of human resources policies covering all employees of the SME and being an issue for in-depth social dialogue.

The delivery of business skills by using e-Learning has many advantages for the SMEs in comparison with conventional training delivery techniques. Delivery costs are considerably lower and staff will not be off site during training. Downtime would be minimised and productivity would be maintained. Training could take place at any time and could be scheduled to take place during slack periods of the working day. Training courses could also be provided immediately almost on an à la carte basis, rather than waiting until the required number of participants has been gathered for a conventional, face-to-face, off-site course.

But it seems that e-Learning until now only takes place within big companies. Outside of the IT sector there is little activity going on in SMEs, related to e-Learning. "SMEs often agree with the need to put training in place", remarked Gordon Gough, Chair of the Institute of Business Advisers in Northern

Ireland, "but they are slow to implement any training plan. On-line delivery may encourage adoption but the training providers need to get the benefits message across accurately" (Online Educa Berlin 2004).

Many of the perceived problems are, however, based on misconceptions or prejudices born out of a general suspicion of an educational process in such companies where it is not teacher driven. They are afraid of high costs and overhead for the content maintenance. Another difficulty for SMEs is that most of them do not have a suitable infrastructure for learning. Staff will not in general be allowed to take time off for study when it is necessary, and very often will not be funded to undertake further training.

Moreover SMEs do not seem to be very interested in e-Learning because of the e-Learning products which are mostly standard products. Standard products are not adapted to the specific needs and demands of SMEs. For big enterprises it is possible to use standard products for some tasks and goals while getting tailored products for specific needs, mostly in cooperation with an e-Learning manufacturer. For SMEs this strategy is too expensive. One approach to solve these problems is the so-called 'Mass Customisation'. This concept is based on modules of the teaching units. Sometimes it is even necessary to 'destruct' produced e-Learning units and to rebuild them into modules. Another important aspect for high quality and 'payable' products is a 'Content-Sharing-Platform' (see for example, the results of LERNET at www.lernet.info).

Another obstacle in radically changing the way how training is delivered lies in the organisational culture, especially the learning culture (Wade, 2003). In short, the problem is not the technology or the delivery of e-Learning but with the learning culture. Every company has established an own learning culture. It is the way in which the organization teaches its employees to learn and be supported along the way. Two aspects are important in a learning process: the content being presented and skills to master and apply that content once the experience is over. Typically, skills to master and apply content are what make up an organization's lifelong learning culture. So the companies need to understand the type of learning culture they have created and they are supporting. If it is a highly dependent one, they need to start introducing skills that foster a more independent approach. They need to introduce the correct learning options that support their current culture in the best way possible. One solution for making the transition to an 'electronic' lifelong learning culture easier is to blend traditional learning delivery with e-Learning solutions (Hamburg *et al.,* 2004). Professionals, managers and trade unions play a crucial role in this process.

3. Examples

Our first example refers to a group of projects funded under the Department for Education and Skills (DfES) Innovations Fund in the UK which is designed to make higher education work better for students and business. They focus on improving links between higher education and employers:

- *OPUS: Understanding the Future: Bridging the Information Gap between employers Higher Education and e-skills* aims at increasing higher education's ability to respond to changing demands of employers in IT services by ensuring that the industry better understands and responds to the needs of higher education in terms of its labour market intelligence and careers information; and that HE staff are better equipped to advise students about opportunities in the sector.
- *Northamptonshire Business Environment Forum* is an organisation that offers short courses both for students and employees from SMEs. It will encourage and equip students to work in local SMEs and offer continuing professional development that encourages lifelong learning for SME employees.
- *Virtual Hothouse Centre for Enterprise* is an e-based business incubation centre which supports the development of new business opportunities initiated by students and graduates from East Midlands HE Institutions by accelerating the development of ideas and offering support through on-line mentoring and resources.

- *Professional Training for Construction* is a model for flexible delivery of education and training which will allow learners without previous experience of HE the opportunity to learn at their own pace and at times and places which suit them.
- *Developing Learning Organisations – Risk Management Alternatives* is a model for co-operation between academic practitioners in the arts and humanities, and employers in a range of sectors, which will enhance the employability of graduates in the above disciplines, and will support cultures of learning within and between employing organisations.

The second example *ARIEL – Analyzing and Reporting the Implementation of Electronic Learning in Europe* – is an international joint project funded by the European Commission in the framework of its e-Learning Initiative. The project investigates e-Learning and life long learning for SMEs concerning didactic approaches, benefits and fields of application. Another theme is the evaluation of the impact of previous EU programmes in the field of electronic learning. On this basis ARIEL will build scenarios of the future development of lifelong learning, based on e-Learning in Europe. An important part of the project activities is the dissemination of the results to SMEs, providers of further education, regional economic development agencies and political actors in the countries involved. ARIEL is coordinated by the IAT and has cooperation partners from Ireland, Italy, Hungary and Romania. ARIEL's tasks include systematic gathering of relevant information concerning ongoing e-Learning activities in Europe, in-depth analysis of these activities and dissemination of information to targeted audiences. ARIEL hereby focuses on lifelong learning solutions and concepts for SMEs which aim at improving their work and supporting their integration into the European market. ARIEL started in January 2004; the following activities have been carried out till then: During the kick-off phase (01/04 – 03/04) the overall project co-ordination has been installed including the setup of an BSCW Server for information exchange between the project partners and the development of the project website (www.ariel-eu.net). The website functions as dissemination instrument and is available in five languages. Currently the website contains information about the project objectives, proceedings, organization and results, about the participating partners and project meetings. In addition, various documents and articles regarding the topic e-Learning in SMEs' are available for download. The content is frequently updated.

During the second phase of the project (04/04 – 09/04) an evaluation scheme has been developed, e-Learning related material collected and e-Learning projects monitored. In this context the first step taken was the sifting of 842 projects which are documented in the database of e-learningeuropa, of which 411 projects (48.8%) aim at the target group SMEs. Here it was shown, that the descriptions of the projects deviated clearly from each other regarding the content and the informational depth. Therefore the need for additional in-depth research arose. Next to an email questionnaire the website has been used for the acquisition of comparable information about e-Learning projects in Europe. For this purpose an online questionnaire had been developed, available in five languages.

The following part presents the main results of our e-mail-survey concerning relevant facts for lifelong learning. The response rate to the online questionnaire was filled in by 114 project leaders. The results can be summarized as follows (Figure 1):

1. The project *aims* vary from the development of e-Learning Applications (51 entries) over the support of e-Learning processes (42 entries) to the implementation of e-Learning (46 entries). 27 projects stated other than the above named targets. Blended Learning is on the fourth place with 26 entries – this could be an indicator for the increasing relevance of these concepts.
2. 81 projects (23.48%) defined SMEs as major target group.
3. As different as the project aims and their target groups are the expected results and outcomes. Concepts for e-Learning and vocational training are the leading targets, followed by Networks and Software. Concepts and Approaches for *lifelong learning* are the expected results for 34 projects – which is the fifth rank.

Conclusions

Many SMEs carried out work in various social settings which plays an important role in people's live. Therefore in order to make a contribution to business improvement of SMEs by lifelong learning, this has to be embedded in their work organization from an economic, human and social point of view. A lifelong learning culture of SMEs that could support this process is missing in most SMEs and it remains open how such a culture can be developed.

Another important aspect that should be improved is the use of e-Learning in SMEs that can make an important contribution in continuous vocational training particularly for acquiring business skills because this is missing in most of them. At policy level European and national programmes have paid more attention to the importance of the Internet and of digital technologies for e-commerce and B2B in SMEs and very limited attention to the use of ICT for learning, particularly of e-Learning. So despite of the recognition of the need for policy to support and develop lifelong learning and e-Learning in some European States a considerable number of outstanding policy issues remain. Also questions like "How labor market policies can recognize, support and reward lifelong learning" should be answered because in many European countries policies in these two areas are separated.

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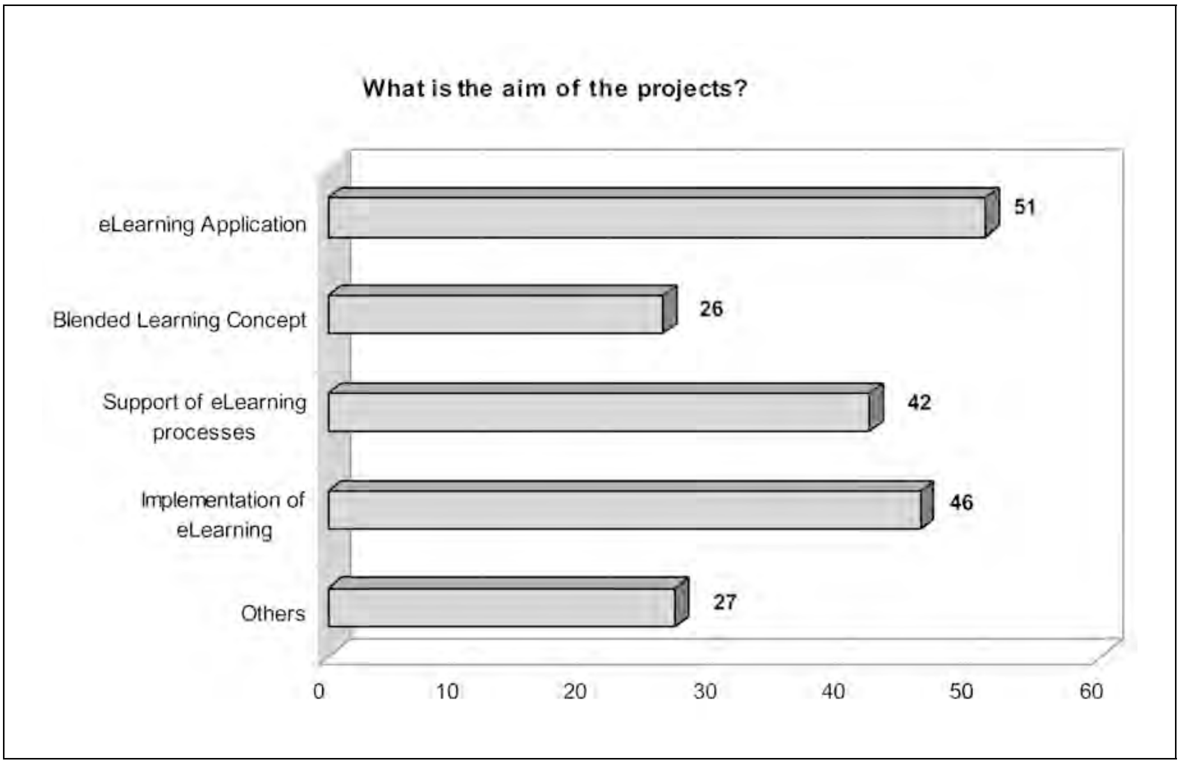

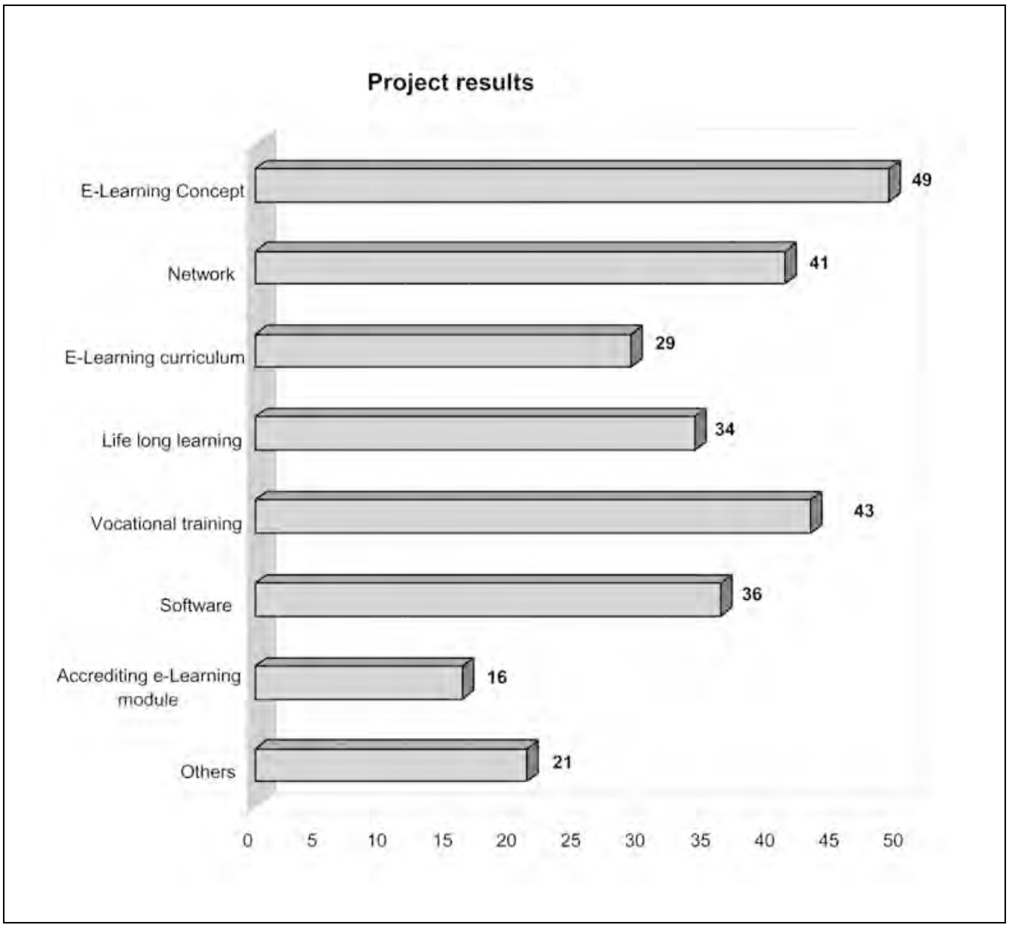

Figure 1. Aims and results of the projects

TOWARDS COLLABORATION AND JOINT-REGULATED LEARNING IN WEB-BASED ENVIRONMENTS

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Objectives

The session focuses on the question of how to advance collaboration in higher education through the Web. The aims of the session is (1) to introduce the theoretical framework and architecture of a new Web-based tool "*The IQ Team*" which is an interactive on-line assessment and support system to learn social skills needed in co-operative work, (2) to present the validation process of *the IQ Team* with two samples (N=259 and N=275), (3) to present the empirical results of on-line students' social skills in different groups, and (4) to elaborate on the theoretical grounds of self-regulative learning for how the Web can provide powerful tools to develop instruction in higher education towards joint-regulated learning.

Perspectives and theoretical frameworks

Need for an assessment tool for the Web

Learning through the Web is both an individual and a social process. The social dimension emerges in knowledge construction and in different ways to support students' learning, e.g. help-seeking strategies, providing feed back and emotional support needed for persistency in learning processes. Learning has increasingly been seen as embedded within a social context and framework. Successful knowledge building communities establish socio-cognitive norms and values that all participants are aware of and work toward (Slavin 1997; Scardamalia & Bereiter 2004). The Web-based environments are important forums for joint problem solving, knowledge building and sharing ideas. The serious problem is that students' capacities to work co-operatively may be weak. Virtual teams may have difficulties acquiring, comprehending and acting on internal or external feedback that could stimulate their communication practices. Virtual team members may not feel comfortable criticizing one another or expressing their feelings to distant teammates about problems they see with the group's communication. They may also have problems interpreting cues from distant team members. Dialogue and collaboration may be hindered because of the reduced number of social cues (e.g. facial expressions, inflection, nonverbal cues) and increased social distance (Huysman *et al.,* 2003, 432; Cramton 1997).

Architecture of the IQ Team

The IQ Team is a system through which on-line teams can find cues about the group processes and learn the social skills needed in collaboration (http://iqform.edu.helsinki.fi/index_en.html). The idea of reciprocal symbol systems and distributed cognitions (Salomon 1993; 1998) has provided the guidelines for an interactive databank and tutorial set. Learners' own capacity, virtual learning environments, self-assessment tools, and tutoring systems have been constructed to interact in an intelligent and reciprocal way. Technological solutions are also modified with these adaptive and interactive principles.

The name *The IQ Team* refers to the idea that technological learning environments and platforms should be "intelligent" taking into consideration individual and group differences and supporting students to grow as learners and group members. *The IQ Team* consists of the following elements:

1. An interactive test bank with three sets of questionnaires for a team's self-evaluation. Students have their team profiles on-line, and they can also save them for future comparisons and reflections.
2. Tutoring sets for monitoring group processes and advancing dialog on the Web. The tests and tutoring sets are interconnected with a hypertext structure for each sub component of the tests.
3. Private and group diaries for group process reflection.

Theoretical basis of the tests

For building the test bank system *The IQ Team* has applied ideas of metacognition and self-regulation to collaborative processes. The basic outlines are from a three dimensional concept of metacognition (Borkowski 1996; Pintrich & Wolters & Baxter 2000; Pintrich 2002). Three interrelated aspects are: (1) Metacognitive knowledge, (2) Metacognitive judgments and monitoring, and (3) Self-regulation representing the highest level of metacognitive activity. *The IQ Team* aims at advancing successful learning environments where group members can monitor and control their learning towards *"joint-regulated learning"*.

Metacognitive knowledge knowledge is usually about person, task, and strategy variables and their interactions. In co-operation people members must be aware of how they influence on the group behavior. Knowledge about their own and others' roles, and discussion about the influence of different roles, is important, even though people do not always take the same role. And in the same group, different roles can be distributed to different persons at different times (e.g. Cohen 1994; Johnson & Johnson 2000). *The IQ Team* has a test called *"Roles in groups"*. It is constructed using Johnson & Johnson' s ideas about co-operative learning. The tests have six dimensions: *Rejecting, Dominating, Encouraging, Conforming, Sharing know-how, and Avoiding.*

Metacognitive judgments and monitoring are activities and processes that learners engage in while performing a task. This category consists of learning judgments, feelings of knowing, comprehension monitoring, and confidence judgments. *The IQ Team* have the following tests below.

The Test of Social Interdependence

Social interdependence is structured in a situation. It determines how individuals interact with one another. Social interdependence exists when individuals share common goals and each individual's outcomes are affected by the actions of the others (Deutsch 1962; Johnson & Johnson 1996; 1998; 2000). Based on Johnson and Johnson's ideas about social interdependence cooperative and competitive scales were constructed. Individuality as one working preference was added to the test. The assessment components are: *Individualistic, Competitive, and Collaborative*.

The tests of Group Processes and Knowledge Creating

The original test version consisted of two measures for group processes. One was for interaction processes, another for knowledge creation. Interaction tests were based on interpersonal relationship theories (Douglas 1979; Gurtman & Pincus 2000).

The other test of group process was created according to Nonaka's and Takeuchi's (1995) ideas of knowledge creation processes. This test consisted of descriptions of facilitating conditions in a group. Effective knowledge creation depends on an enabling context. In according to Nonaka *et al.* a shared space *(ba)* fosters emerging relationships and facilitates individual minds to become integrated in a collective cognitive space (Nonaka & Konno 1998). The IQ Team validation analysis revealed that interaction processes and knowledge creation are highly interconnected. The original dimensions were difficult to extract. After confirmatory and exploratory factor analysis the following dimensions were accepted: *Trustful atmosphere, Goal orientation and commitment, Innovation and Creativity, Power of collaboration, Differences as a resource, and Tutor/teacher as a resource*.

Methods and modes of inquiry

The modes of inquiry have been an interaction between empirical data collections and the development of the Web-based tool.

1. In 2002, questionnaires were used in order to identify group qualities and processes in higher education. Students answered to structured items and open-ended questions.

2. In 2002-2003, an analysis of the questionnaire resulted in the modification of the interactive tests for on-line environments. Interactive tutoring resources were designed, with private and group diaries being built on the Web.
3. In 2003, users' evaluations. HE students (N=5) and teachers (N=5) evaluated the Web designing and gave feed back to make as user friendly as possible.
4. In 2003-2004, on-line data was collected from groups using the IQ Team system.

Methods of analysis

All tests have a 5-point Likert scale. The following validation methods were used: (1) an exploratory factor analysis Maximum Likelihood with Varimax rotation (4–10 factor models) in sub scales, (2) confirmatory factor analysis of factor solutions, based on theoretical frameworks, (3) an examination of each separate factor by using factor loading plots of two-dimensional principal component space, and estimating the goodness-of-fit, e.g. a chi-square (χ^2), and (4) an examination of the homogeneity, Cronbach's alpha. Means, standard deviations and t-test were estimated for different student groups, as well as correlations between social dimensions.

Data sources

The first data was collected in four universities (N=259, ages 20-55 years) from different disciplines: Arts and Humanities, Social and Behavioral Sciences, Teacher Education, and Technology and Science.

The second data (N=275) was collected from on-line students in different disciplines in universities and polytechnics: Theology, Social and Behavioral Sciences, Business, Health Sciences, Teacher education, and Technology and Science. Gender could be identified in some groups (67 males, 163 females), as well as a breakdown in HE institutions (university students 82, polytechnic students 48).

Results

Structures of the tests were validated using factor analysis. The validation based on the first sample revealed that all factors offered an acceptable structure when the two last tests were combined. Following slight modifications, the virtual version of the test was very stable and the same test structure achieved with good reliability scores (Table 1).

Table 1: Factors in *the IQ Team* system and their alpha scores.

The tests	Dimensions	Data 2002 N=259	Data 2004 N=275
Roles in group (6 x 3 items)	1. Rejecting	0.83	0.76
	2. Dominating	0.83	0.68
	3. Encouraging	0.77	0.83
	4. Conforming	0.72	0.63
	5. Sharing know-how	0.74	0.67
	6. Avoiding	0.75	0.69
Social Interdependence (3 x 3 items)	7. Individualistic	0.89	0.82
	8. Competitive	0.80	0.76
	9. Collaborative	0.75	0.75
Group Processes and Knowledge	10. Trustful atmosphere	0.80	0.64
Creating (6 x 3 items)	11. Goal orientation and Commitment	*	0.66
	12. Innovation and Creativity	0.78	0.61
	13. Power of collaboration	0.78	0.57
	14. Differences as a resource	0.87	0.51
	15. Tutor/teacher as a resource	*	0.81

* = dimensions remodified by constructing new items

Group roles and processes of on-line students were supportive. Students have very high values in social qualities and there were no significant differences between university and polytechnic students. Rejecting and avoiding were not typical behavior. The significant gender differences indicated that males (M=3.10) are more dominating than females (M=2.83), t=2.271, df=211, p<0.024 and females (M=4.22) more sharing than males (M=4.01), t=-2.252, df=211, p<0.025. The gender roles seem to be traditional also in on-line courses.

Social interdependence and individualistic approach are complementary. The important result (Table 3) is that all social interdependence variables, including the individualistic aspect, have high correlations (Pearsons) with group processes. Individual and co-operative work are not exclusive but complementary. In Web-based environments students need both. In particular innovativeness and trustful atmosphere have high interrelationships with individualistic, competitive and co-operative approaches.

Table 3: Correlations of the social behavior (* = p<.05, ** = p<.001)

Social Interdependence	**Individualistic**	**Competitive**	**Collaborative**
Individualistic	1.000	0.425**	0.291**
Competitive		1.000	0.270**
Collaborative			1.000
Roles in groups			
Rejecting	-0.042	0.079	-0.146
Dominating	0.195*	0.132	0.036
Encouraging	0.272**	0.099	0.292**
Conforming	0.035	0.004	0.061
Sharing	0.276**	-0.022	0.353**
Avoiding	-0.085	0.094	-0.085
Group processes		0	
Trustful atmosphere	0.752**	0.408**	0.498**
Goal/Commitment	0.373**	0.722**	0.441**
Innovation	0.395**	0.288**	0.841**
Power of Collaboration	0.300**	0.174*	0.596**
Difference as a resource	0.339**	0.294**	0.500**
Tutor as resource	0.286**	0.234**	0.291**

Conclusions

The structures of the tests in the Webb assessment system are stable and validate for further use in higher education. The groups who used the IQ Team System had high values in social qualities. The results indicate that on-line students can have very high social skills and they need individualistic, competitive and collaborative orientations in joint knowledge creating processes. Students must learn to use them in a strategic way to achieve joint objectives.

Importance of the study

Self-regulation represents the highest level of metacognitive activity. Working in on-line groups also requires checking the situation. Sharing expertise and creating knowledge in a group is a continuous reflective process, in which members must be aware of their roles, tasks, and how to monitor the work in a strategic way. The IQ Team aims at advancing successful learning environments where group members can monitor and control their learning. It aims at joint-regulated group processes. The study ***provides co-operative tools and validated tests for higher education and the further research.*** The system can be integrated with any kind of on-line instruction and it can be complementary to campus-based courses. Higher education has a special role in knowledge creations and innovations. The knowledge that is now required is for very complex problems. It requires interaction between different partners. This study provides ***new possibilities to learn collaboration***.

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BRINGING COLLABORATION TO E-LEARNING MAKING COMPETENCE DEVELOPMENT POSSIBLE

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1. Introduction: Lifelong (E-)Learning for an unpredictable future

The development of key competencies is an imperative for today's abilities to act in a more and more complex world – this is the central challenge of lifelong learning (in the following: LLL). E-learning has proven to be quite effective in delivering information. When it comes to competency development, however, most of today's e-learning solutions lack authentic learning scenarios which enable learners to solve problems in social interaction with each other – a requirement necessary for competency development. The concept of LLL has made a great carrier in the last 30 years. It can be analysed from different perspectives of theory and practice: From the point of view of educational science, as leitmotiv in educational policy, as an instructional design concept and under the perspective of subjective learning and acquisition processes.

LLL is more and more coming to reality for more and more people and has become an important driver for individual and collective development in modern societies. It has also separated continuously from the level of adult education as its primary institution and is diffusing into educational sectors, institutions and in a variety of individual learning modes and locations (Kade/Seitter 1996). It is not de-institutionalising but the institutional settings in which it takes place undergo a process of diversification. This creates the dynamic network character of the concept today. Kade/ Seitter (1998) analyse the concept in the light of three different perspectives:

1. *LLL between emancipation and obligation:* From a positivistic point of view LLL is a medium to enable the individual to participate in a continuously changing world and develop their own concepts of life. From a more critical point of view LLL is seen as an obligation which urges individuals to update their skills in a more and more economically driven world.
2. *LLL between avoiding risks and creating risks:* In a more and more multioptional society, biographies are always situated between new options and possibilities on the one side and new risks and restrictions on the other side (Gross 1994). LLL can be conceptualised as a process of avoiding risks. The already introduced concept of key competences, for example, tries to enable people to take act competent in an unforeseeable future. LLL in itself is at the same time part of the process which constitutes the risks in a constantly changing society.
3. *LLL as a possibility of enjoying life:* In this perspective LLL is not an obligation to prepare for an unforeseeable future but a process to enrich the present life. Learning is not mainly used to compensated a deficit but rather to enjoy the present spare time (Kade/Lüders/Hornstein 1993, Lüders/Kade/Hornstein 1995).

In all of the summarised perspectives LLL has to be flexible and – at least in the first two approaches – has to prepare individuals for an insecure and unforeseeable future. This means that not qualifications for certain restricted areas and defined purposes are in the focus but rather competencies which enable individuals to act in potentially unforeseeable situations. Especially competencies and not qualifications are therefore necessary to meet the not predefined future challenges.

Against this background we can identify a problem in the field of e-learning. Knowledge, resp. information can be delivered quite effectively with e-learning. Methodological or domain specific competences are much more difficult to achieve with e-learning, and experiences and expertise can only be acquired through activities and self-performed problem solving (Erpenbeck 2005). It becomes even more problematic when it comes to personal and social-communicative competencies because they always contain values and are embedded into cultural contexts. They are not learned like knowledge but are rather acquired through cognitive dissonance processes and conflicts (Erpenbeck/Weinberg 1993).

These can be induced in social rather individual learning situations. E-learning therefore has to focus more on communication and collaboration than on information and presentation. To make e-learning valuable learning opportunities for individuals in their LLL processes it becomes more and more necessary to focus on providing authentic social learning situations.

This paper focuses on CSCL. In a first part (chapter 2) the problem of competence development is elaborated. The second part (chapter 3) focuses on theory and practice of collaborative learning (CL). The third part (chapter 4) presents research results and suggests a roadmap for the next steps.

2. E-Learning and the Competence Lack

Erpenbeck (2005) emphasizes that e-learning can be used for acquiring knowledge and information quite effectively. When it comes to creating learning opportunities which aim to develop competencies and allow learners to make own experiences or participate in social interactions, however, e-learning often fails to perform. Erpenbeck differentiates between competence and qualification. *Qualification* as a concept concerning skills to perform, predefined, externally required actions and reactions by using certain means and procedures which can be directly learned. *Competency* on the other hand is a concept which relates dispositions and skills which are in principal unlimited and enable individuals to act self organised in a principally undetermined future (Arnold 2000). Competences therefore are dispositions of self-organisation (Erpenbeck/ Heyse 1999, 2001).

Erpenbeck (2005) emphasizes that e-learning can be used efficiently for teaching but has difficulties to provide a learning environment in which learners solve authentic problems in social interaction with other learners – and thus acquire value and knowledge; this is especially true for experiences. This constitutes a principal contradiction: On the one hand e-learning and information technology is more and more introduced to educational scenarios on all levels. This can be seen as an irreversible process. On the other hand the transition from traditional vocational and ongoing training to vocational competence development is also not reversible. The problem is, that existing educational technologies do not meet the needs of modern vocational competence development.

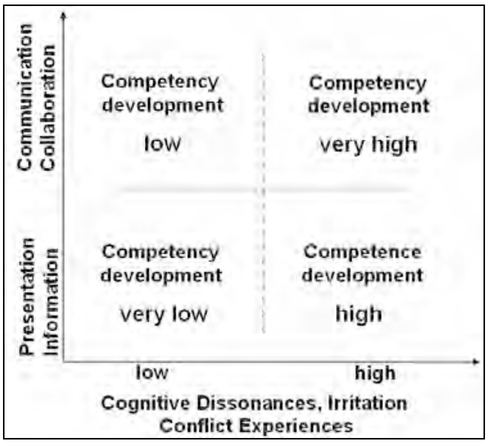

Figure 1. How can e-learning support competence development?

The conclusion for e-learning is evident: Since experiences, interaction and interiorisation of values, norms and rules is necessary for competence development it becomes important in e-learning to focus on elements of irritation and cognitive dissonances. Computer Supported Collaborative Learning (in the following: CSCL) therefore becomes increasingly important. Figure 1 shows the benefits of communication and collaboration in contrast with learning psychological dimensions for competency development. The next section summarises the state of the art research in the field of collaborative learning (CL).

3. Theory and Related Research for CSCL

The bad news is that CSCL is still a fairly new field of research, starting its carrier in 1989 with the first international conference on CSCL. The good news is that the history of research in collaborative learning (without the CL) "…can be called the success story…" (Koschmann 1996). Therefore it makes sense to take a look across the borders of CSCL and summarised valuable research findings from the area of CL which give insight into how CSCL environments have to be structured.

3.1 Theoretical Background for Collaborative Learning

The field of CSCL has many theoretical implications and disciplinary backgrounds. The filed covers anthropological theories, information sciences, social sciences, educational science and psychology, there especially the field of learning psychology. Under the light of learning psychological theories CSCL is based on (socio-) constructivist approaches. Accordingly learning is a construction process, learners learn on basis of their experiences and own values, opinions and patterns. This view challenges the illusion of an acquisition metaphor for learning – where learning results are a plain representation of what had to be learned in the first place – and suggests a 'participation metaphor' for learning, where learning takes place by actively constructing ones own knowledge. Slavin (1997) has presented four major theoretical perspectives aimed at explaining the achievement effects of collaborative learning: motivational-, social-cohesion-, developmental- and cognitive-elaboration perspective.

1. *Motivational Perspective*: Motivational perspective focuses primarily on the reward or goal structures under which students operate. From a motivationalist perspective, collaborative incentive structures create a situation in which the only way group members can attain their own personal goals is if all the members of the group are successful. In these conditions, group members must both help their group mates to do whatever helps the group to succeed, and to encourage their group mates to exert maximum efforts (Slavin 1995).

2. *Social Cohesion Perspective*: This theoretical perspective is related to the motivational viewpoint. According to this approach, effects of CL on achievement are mediated by the cohesiveness of the group. Also this perspective emphasises primarily motivational rather than cognitive explanations for the instructional effectiveness of CL. There is, however, an important difference. Motivational theory stresses extrinsic rewards: students help their group mates learn because it is in their own interests to do so. Social cohesion theorists, in contrast, emphasise the idea that students help their group mates learn because they care about the group. The social cohesion perspective emphasises teambuilding activities in preparation for CL, as well as group self-evaluation, instead of external incentives and individual accountability. A well-known application of this theory is Aronson's Jigsaw method (Aronson/ Blaney/ Srephan/ Sikes/ Snapp 1978), in which students concentrate on different topics in 'expert groups' and subsequently share their expertise in groups where students from all expert groups come together.

3. *Developmental Perspective*: The fundamental assumption of the developmental perspective on CL is that interaction among children around appropriate tasks increases their mastery of critical concepts (Damon 1984, Murray 1983). Both major traditions of developmental psychology, the Vygotskyan and the Piagetian, have substantially contributed to the theory of collaborative learning. Although Vygotsky (1934/1994, 1935/1994) in general did not believe in the usefulness of spontaneous cooperation among children of the same age, his theoretical ideas have been widely used in later theories of CL. Particularly Vygotsky's (1978) idea of the zone of proximal development has been useful for understanding mechanisms in CL. According to this view, collaborative activity among children promotes growth if children of similar ages have developmental differences. More advanced children are also benefiting and performing more advanced within one another's proximal zones of development as if they would act as individuals. Piaget (1926) held that social-arbitrary knowledge – language, values, rules, morality, and symbol systems – can only be learned in interactions with others.

4. *Cognitive Elaboration Perspective*: Cognitive Elaboration means elaboration of cognitive structures in a social context. One of the most effective means of elaboration is explaining the material to someone else. Several studies on peer tutoring have found achievement benefits for the tutor as well as the tutee (Devin-Sheehan/ Feldman/ Allen 1976). Webb (1989, 1992) found that the students who gained the most from collaborative activities were those who provided elaborated explanations to others.

All four perspectives described form the theoretical background for the current applications of CSCL.

3.2 What Makes Collaborative Learning Effective?

As suggested above CL (in contrast to CSCL) has a long tradition. The research findings highlight a number of success factors for collaborative learning which are also important for CSCL:

- *Group-Goals*: It is important to support individual responsibility and group awards at the same time. Individual Responsibility is an effective means against lurking and can be achieved if individual contributions stay recognisable throughout the learning process and in the learning result. Group awards first of all mean that not individual achievements but groups achievements are recognised. The group has to make sure that every groups member reaches the group goals.
- *Group tasks*: Mostly three characteristics are mentioned in literature which constitute group tasks – positive resource interdependence, creative solutions, intrinsic motivation. Positive Resource interdependence means that learners depend on each other because the ressources needed to achieve the group task (knowledge, strategies and tools) are distributed amongst them. Secondly creative solutions have to be possible to fulfil the requirements. Weinberger *et al.* (2002) state that group tasks with only one correct solution prevent an effective discourse. Intrinsic motivation emphasizes that the task has to be of personal relevance and interest to the learners (Theory of situated learning).

Apart from these success factors research literature also mentions some barriers of CL processes:

- *Premature consensus*: There is a danger that learners are too superficial in finding a good solution for a problem and rather come to a quick consensus. This prevents an in-depth learning.
- *External (over-)structuring*: For CL it is important to give learners the opportunity of self organise learning situations. External structuring and role determination are as unnecessary and not useful as exaggerated attempts to motivate from outside.
- *Transactive memory*: It is important that group members have knowledge about the group structure: Who is responsible for what? And: Who has access to which ressources needed to fulfil the group task?
- *Topical 'straying'*: There is a danger that learners discuss everything but not the topic of the course. There is also a danger of decreasing learning processes and to learn wrong things. It is therefore important to coach the learning process.

4. Future Challenges for CSCL

CSCL research is still a young field of research and development. It is more and more coming to e-learning. This has to do with the enormous potentials in the area of competency development which are described above. However it presents a challenge to all involved stakeholders – the learners who have are put in a more responsible position for their own learning success and quality and the teachers/ tutors who are no longer the 'sage on the stage' but the 'guide by the side' – with all consequences. For the future it is important to make CL in e-learning-environments more naturally and common as it is today. Two aspects are especially important to achieve this: The development of a portfolio of specific collaboration scenarios and the development of methodological integrated learning managements systems (in the following: LMS).

4.1 Portfolio of Educational Scenarios

Collaborative scenarios are descriptions of collaboration processes. These can either be done in form of so called 'learning scripts' which rather strictly organize the social interaction process in a clearly structured way or in form of a more general and open configuration. For e-learning, a transfer of classroom collaborative scenarios to the virtual environment has to be done. Restricting factors for this transfer are the communication media which structure the communication between the participants in e-learning. Other aspects which have to be taken into account are:

- *Roles*: In collaboration scenarios different roles are involved. For simulations and role plays this is fairly obvious; but also in methods of collaborative text work the scenario includes a documentation role, a presentation role and/or a moderation role.
- *(Shared) ressources*: In virtual environments it is a challenge to allow shared editing of documents and common navigation through information spaces. It is not only a question of version management and right management but also of representation of the commonly created results.
- *Articulation of expectations*: Participants in presence scenarios can easily articulate their expectations and directly change the mode of workflow. For CSCL, the logistics of change processes become much more difficult.
- *Socialibility and Awareness*: A great difference between presence and virtual collaboration scenarios is the individuals' perception of the group situation. The awareness of the social situation, in recent research called 'socialibility' (Kreijns 2004), in virtual collaborations is restricted to communicative acts which are factually transmitted through the communication media used.
- *Communicative/collaborative transactions*: The transfer of presence collaboration scenarios to virtual scenarios has to take into account the different communicative and cooperative transactions from presence to virtual scenarios, equivalent possibilities have to be found.

For collaboration scenarios it is important to put the instructional goals first, then define the necessary roles and ressources, and thirdly choose which technological solutions are necessary to implement the collaboration environment.

4.2 CSCL Integrated Learning Technologies

The integration of collaborative elements into the LMS is crucial to the success of CSCL. On the one hand this relates to the technical integration, on the other hand to the integration into instructional sequences. Several possibilities exist today to collaborate through the web when e-learning. Most of them are so called 'spontaneous' collaboration possibilities (learners start collaborations spontaneously, more or less independently from the course content;

SPOC: Spontaneous Point of Collaboration) (Wessner/ Holmer 2003). More sophisticated collaboration tools are integrated with the course content. That means that at a certain point in the course, e.g. after learners have all read a certain text, a collaboration arrangement – e.g. a brainstorming session – is automatically suggested to them ('intentional' points of collaboration; IPOC: Intentional Point of Collaboration). IPOCs demand a more advanced and integrated technology, combining data from user profiles with course content to start a fitting collaboration tool at the correct point of time.

		Support for collaborative learning	
		Low	High
Integration in LMS	Low	Generic collaborative Learning Management System	*Method-based* collaborative Learning Management System
	High	Integrated collaborative (Learning Management) System	Integrated *method-based* collaborative Learning Management System

Figure 2. Integration of collaboration technologies into learning management systems

The use of collaboration technologies, e.g. a brainstorming session or a group discussion, depends on its integration into the LMS. Looking at today's LMS we can see that only a low degree of integration is offered – and can therefore conclude that IPOCs are only seldom used today. Figure 2 shows the possible forms of integration of collaboration technologies into learning management systems – on the one hand analysing the degree of integration into the LMS, on the other hand the degree of support for collaboration sequences.

1. *Generic collaborative LMS*: NetMeeting (http://www.microsoft.com/netmeeting), BSCW (http://bscw.gmd.de) or Teamwave Workplace (http://www.teamwave.com), which have not been developed especially for learning purposes. Those systems provide communication possibilities and user administration functionalities, sometimes also offer role specific profiles.

However, they do not follow specific collaboration methodologies and are not integrated with the content.

2. *Integrated collaborative LMS*: Blackboard (http://www.blackboard.com), LearningSpace (http://www.lotus.com/learningspace), WebCT (http://www.webct.com) or LearnLinc (http://www.learnlinc.com), which offer the technological and organisational integration of collaboration into the LMS. Several communication- and collaboration tools can be used within one technological environment, user and course data can be administered and course material can be used in several formats. A support for specific collaborative learning sequences is not offered.
3. *Method-based collaborative LMS*: CLARE (Wan 1994) offers the possibility to commonly work on and discuss texts, e.g. scientific articles. These systems offer specific collaborative methodologies.
4. *Integrated method-based collaboration LMS*: These systems offer specific methodologies for collaboration between learner and groups. They are also integrated specifically into the course content and provide IPOCs as well as SPOCs. Teacher can predefine collaboration sequences within the course process and learners can spontaneously share learning ressources within the collaboration processes.

5. Conclusion

The article shows the importance of CL to make e-learning a full scale learning environment, bringing competence development to LLL. It start with elaborating the importance of competency development for LLL, rather than qualification achievements. Competency development thus relies strongly on social interaction processes as Erpenbeck (2005) suggests. Collaboration theory and empirical results can offer a comprehensive experience-base for CL methodology. It becomes obvious however that the transfer of CL methods from a presences situation to the e-learning environment is challenging. Mainly two developments have to be focussed on to make collaboration a more common and natural possibility for e-learning: (1) The development of a portfolio of specific CL methodologies which take presence scenarios as a bases and offer the translation of roles, communicative transactions and resource sharing processes to the filed of computer mediated communication. (2) The development of integrated method based LMS which enable learners and tutors to combine collaboration processes as close as possible with the course materials and the LMS.

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E-REFLECTIONS

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A framework for collaborative online group-work

A number of writers on e-learning suggest that the biggest impact it is likely to have on learning and teaching is through the facilitation of collaboration. Indeed, McConnell (2004) suggests that a new paradigm of collaboration is emerging in response to the challenges posed both by technology and the move towards a "mass education" culture. This new paradigm is characterised by:

- Collaboration and co-operation.
- Dialogue and group-work together with interaction with online materials.
- Collaborative knowledge production.

The aim of the e-Reflections project was to create an e-learning framework for the delivery of the increasing range of courses involving experiential learning and the development of critical reflection. Such courses are frequently modelled on Kolb's learning cycle involving a concrete experience, reflecting on that experience, relating it to a body of theory and then planning how to apply the knowledge gained in future. This then forms the basis of further concrete experience and the cycle starts again.

Learning and assessment as part of such courses typically involve the creation of portfolios, Personal Development Plans (PDPs) and other criterion-related solutions. Their application in vocational areas is readily apparent, leading to their widespread adoption in the UK further education sector. In higher education they are increasingly used on the growing number of professional courses offered including those courses training teachers for the further and higher education sectors.

The 'organic' nature of Virtual Learning Environment (VLE) implementation from June 2002 at University of Leicester resulted in both a diversity of and creativity in approaches to the medium. The rapid development of use (Table 1) suggests that the lack of a clear model or strategy imposed from the centre has not held back engagement with the medium although three broad approaches have emerged. First, over 40% of students are using the Blackboard VLE made available and supported centrally from June 2002. Second, many departments had a long history of e-learning development and have opted to defer Blackboard adoption, continuing to use the web-based resources they have already created. Finally, the Leicester-Warwick Medical School has opted for the 'structured' implementation of a different VLE – Fretwell-Downing's Learning Environment. Such diverse patterns of implementation afforded by organic implementation provided valuable comparators within one institution.

A disadvantage of such rapid organic growth, however, was the problem posed in providing staff development support across such a range. Furthermore, it was more difficult to collate and share the disparate collective experience of VLE implementation. This presented difficulties right across the organisation with colleagues new to the medium constantly 'reinventing the wheel' to senior managers with inadequate information upon which to provide strategic direction for e-learning within the University to researchers undertaking projects such as this.

One of the catalysts for this paper was the authors' own engagement with the use of asynchronous online communications (or discussion boards). The richness of the data shared through them had an immediate attraction as a possible research media. The e-Reflections framework itself emerged from attempts to engage University of Leicester staff in such communications by adapting tasks that had previously been used in staff development to an e-learning environment. One of the earliest (and most revealing) became known as 'Virtual Lego' and adapting a much-used management training exercise developed by NASA: 'Stranded in the desert'.

Such early experimentation (Winter 2002/3) confirmed that if the implementation was to progress as rapidly as hoped, simply providing technical support for implementation was insufficient. It was essential to provide a framework for such engagement. An initial literature search provided a wealth of potential models for e-learning implementation. It was the work of Gilly Salmon, however, that immediately appealed because it provided a framework that not only emphasises the pedagogy of e-learning but provides a means of deeper engagements with e-learning – both interaction and integration. The five stages of the Salmon's Networked Learning model are explored in the literature review above (Table 2). The model has an immediate appeal to teachers because it translates familiar taxonomies of learning (from Bloom *et al.,* in 1956 to the current day) to the e-learning context.

Although Salmon's work focuses on purely online learning, the potential of applying it to a 'blended' or hybrid model of delivery (i.e. with varying proportions of face-to-face and e-learning delivery) was immediately apparent. The emphasis placed on delivery through 'e-tivities' – the title Salmon gave to structured tasks such as 'Virtual Lego' and 'Stranded in the Desert' – provides a mechanism that is easily understood and reproduced in context by busy teachers. In Salmon's terms (2002b), e-tivities are "…motivating, engaging, purposeful activities developed and led by an e-moderator" and are, "…in the hands of teachers themselves and promote active learning". Perhaps more importantly, they provide, "…frameworks for active and interactive online learning". The emphasis Salmon placed on the structured reflections of participants on their teaching (or e-moderating) had relevance for the increasing number of courses promoting critical reflection.

The e-Reflections framework was intended to facilitate the introduction of collaborative online group-work on a wide range of courses. It resulted from a series of planning sessions in mid-2003, taking the form of an online staff development programme of the same name. The objective of this five-week, online course was to enable participants to explore the knowledge and skills involved in online tutoring. An essential part of the course was to involve participants in using e-learning media – discussion groups, virtual classroom sessions (or chats) and web materials – whilst exploring these issues. This was achieved through communicating with other participants working in a wide range of contexts at the University of Leicester and beyond. There were a number of explicit outcomes for the course for potential and current 'e-tutors'. First, there was the opportunity to experience the medium from a student's perspective – a clear need indicated by the feedback from the pilot e-tivities. Second, it provided the chance to the use discussion board and virtual classroom (or chat) facilities that can bring interactive e-learning to any course. Third, participants were encouraged to reflect on both the materials provided on e-learning and on the model of course design – adapted from Salmon's Networked Learning model. Both were intended to provide a framework to be replicated and adapted in their subject area. Finally, e-Reflections aimed to provide an opportunity to explore the technical and pedagogic issues of e-learning (including an evaluation of its impact on learning). From the outset e-Reflections was intended to be as relevant to those introducing an element of e-learning to a 'traditional' course as for those who support distance-learners.

Participants were expected to make a commitment of 15 minutes a day on average. This was designed to enable them to keep up with the flow of the course and make contributions. Whilst the clearly conveyed expectation was that participants would log-on every day, it was made clear that it was possible to miss out some days. The absolute minimum requirement to be able to continue on the course was logging on twice a week. Whilst the course involved a total participant workload similar to a one-day course delivered face-to-face, the control given to allocating that time over an extended period provided considerable flexibility for participants. On average just over 50% of participants completed the programme. It certainly provided data for both deeper studies of engagement with e-learning, particularly regarding the mechanisms and results of transformation of teaching. Furthermore, it provided a means of identifying colleagues to participate in other data collection activities (e.g. interviews). From the outset this provided a source of comparator information from outside the institution with 20% external participants in the pilot courses. This aspect of data collection was enhanced by the adoption of e-Reflections as one of six launch programmes for the Learning Chain – the regional centre of excellence for staff development – ensuring participation from institutions across the region. Feedback suggested that the most common reason for not completing the course was that the early stages provided the information and skills they needed. Others could no longer commit the time required, generally due to a change in their anticipated workload through other duties. The inclusion of this model in a certified course (our Post-Graduate Certificate in Academic Practice) provided useful comparative figures on completion with a significant improvement in completion rates anticipated.

The flexibility of the medium enabled the Staff Development Centre to contemplate this new provision at a time when its workload was already expanding rapidly. Whilst the course involved a total staff workload similar to a 2-day course delivered face-to-face, the allocation of that time was clearly more flexible. It was also recognised at an early stage that e-Reflections has could be a valuable source of data for research exploring the extent to which e-learning could play a role in the transformation of teaching and learning in the sector. Whilst statistics can only provide a crude measure of the level of engagement with a course, the heavy use of the discussion boards indicates strong interest. Early indications from qualitative feedback are that the course can make a significant contribution to the increasing pedagogical richness necessary to achieve wider integration of e-learning into the curricula of the University. Participants clearly see the course as providing both the skills necessary to become more effective online tutors and a model they can adapt to meet the needs of their students.

Perhaps the most successful application of the model to date was its adaptation for Post Graduate students on a one-year course being trained to teach history in UK secondary schools. Keys to the success of this implementation was treating students as stakeholders in their learning on VLE Discussion Boards and the nature of teacher training courses. These courses require extended school placements, necessitating strongly embedding the VLE in the first four weeks of the course before placements began. This needed careful induction[1], integrating and effectively dove-tailing different stages of Salmon's model. Regular blending and embedding of VLE Discussion Boards with face-to-face sessions helps students recognise the learning enhancement value of VLE usage. The e-Reflections course was used as a model for teacher training discussion boards but this was adapted to support the development of reflective thinking in trainee teachers and a vision of learning that was highly learner centred. The blended adaptation of VLE use introduced negotiation with students over the focus, and content of tasks and the number, frequency of new boards and over the life of boards. Students requested prolonging the life of discussions they found most valuable as a reflective tool for their learning. Further, the links to resources were exploited to support student learning based on the structures of the e-reflections course. The decision to involve students in this way was undertaken as a means of providing feedback on their experience as learners along with focus questions at various points in the year. The blending of e-learning in this way also afforded frequent informal discussion of its effectiveness.

Regular use of discussion boards is preparation for using similar VLE facilities throughout a teacher's career[2]. Blended use also encourages high levels of student participation (at least 80% of students were engaged) when learning is negotiated and linked to exploration and knowledge application. It also lead to deeper learning during distance phases of the course when students apply their earlier learning in the context of school placements. Structured use of discussion – involving recognition of issues raised by students as valuable, in addition to those initiated by the tutor – encourages frequent engagement. Students value the discussion boards more – especially for knowledge exchange and peer support – during distance phases of the course as blended use helps transfer the social interaction aspects of learning to the VLE. This is especially valuable in developing peer support during such school placements when students can become isolated from their peers. It helps meet their needs for emotional support, ongoing reflection as well as information and knowledge exchange.

[1] Salmon, G E-tivities: *The Key to Active Online learning* Salmon's five stage model was used to develop activities in blending VLE with face to face sessions

[2] Such as TeacherNet and Individual Local Education Authorities in England, NPQH qualification for Headship in Schools under the National College of School leadership

Rapid transference of social interaction was achieved in the course induction. The online elements of the course were closely allied with collaborative work in the classroom building on the early stages of Salmon's model. A collaborative, highly interactive and exploratory ethos in face-to-face sessions was mirrored strongly in online exchanges (both in on campus and distance phases). Minimum time constraints and guidelines on required frequency of use of the VLE by students were avoided. Instead the learning benefit – an expectation that their reading and contributions would develop understanding – was used to motivate participation after requiring tasks to be completed by all students. As students moved into the distance phase of their course their engagement with the VLE increased. They also initiated topics for discussion and information exchange.

The role of the tutor was to encourage regular use of discussion boards through support, recognition, validation and rewards. It was successful when sustained through the distance phase and personalised where individual learning needs of students are met and student autonomy developed by tutor support. A significant factor was the tutor's position as a new tutor. There was neither a wholly extant course ready to deliver nor any previous experience of teaching the course to act as a model. Student needs for celebration of success in applying their knowledge professionally added a new dimension to their use of the VLE. Peer support – an unplanned product of the VLE – became a model for ongoing use of the VLE and will inform future use. Of significant value to the course tutor was the ease with which the VLE provided early indicators of student performance. It was possible to clearly identify students experiencing difficulties developing reflective thinking or with theoretical aspects of the course. Ongoing support and mentoring (also provided by the University of Leicester) provided a sounding board for designing e-tivities in addition to developing knowledge of the VLE.

A further development of the e-Reflections was its inclusion in University of Leicester's Post-Graduate Certificate in Academic Practice (assessed at M-level). This continues to be the University's programme for staff new to teaching in HE, although it is increasingly being used as a means of Continuing Professional Development by more experienced staff. This lead to the extension of the course to Diploma and Masters alongside the creation of a distance-learning route (all from September 2005). The structured reflections made by the participants and their 'stories' will provide data for further research into the role of e-learning into the transformation of teaching and learning. The pattern of delivery follows the e-Reflections model, involving participants in using e-learning whilst exploring these issues.

Conclusions

A repeated theme that emerges from online discussions outlined above is that familiar pedagogical issues are just as important in helping shape online learning. In short, good pedagogy is at the heart of good online learning. The skilful adaptation of models like Salmon's help open the door to meaningful online collaboration. Students appear to become autonomous in using VLEs when they see the benefits to their learning.

Whether engagement in e-learning leads to a new collaborative paradigm – that transforms teaching regardless of medium – is as yet unproven. Nevertheless, considering the use of blended (or hybrid) models certainly forces tutors to adapt and reconfigure learning experiences. Development of blended learning and activities closely linked to face-to-face learning appear to ensure high levels of engagement by students. A fundamental part of such developments is to enhance the development of teachers' understanding of pedagogic possibilities through courses like e-Reflections. This certainly moves beyond the technical workshops and drop in advisory sessions that the University still provides regularly for staff.

For the University of Leicester, this has merely set the scene for the most recent e-learning development – the appointment of Gilly Salmon as our Professor of e-Learning. One of her first initiatives has been to invite those working in e-learning in HE to join 'Beyond Distance' – a collaborative research alliance into the future of e-learning. We look forward to exploring these possibilities with colleagues at EDEN 2005.

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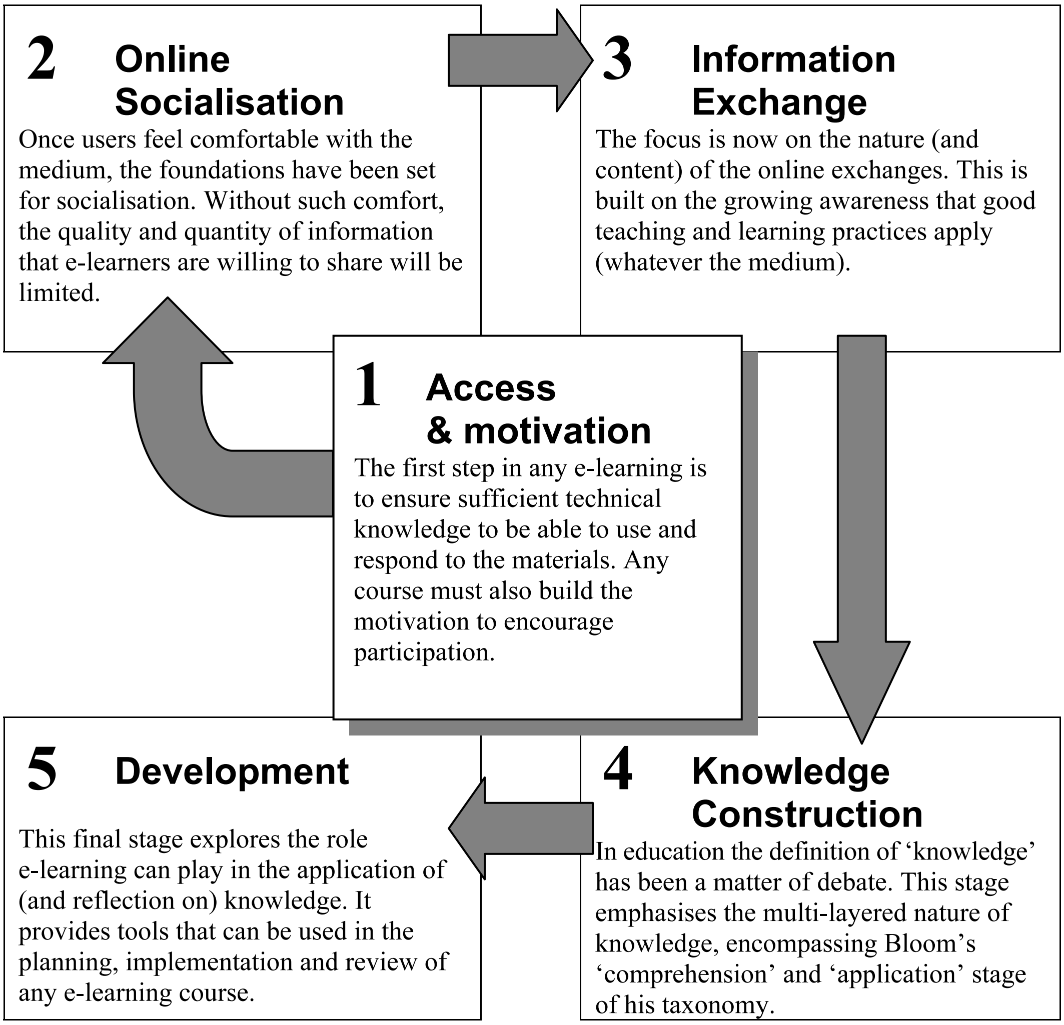
Table 1: University of Leicester’s engagement with the Blackboard VLE

	Jan ’03	*Jan ’04*	*May ’04*	*Oct ’04*	
Supported courses	98	314	382	545	Courses or modules with their own Blackboard course
Active tutors	252	490	588	473	Teachers (and other staff) who can publish materials
Active students	1,490	5,818	6,779	7,070	Active Blackboard accounts

Table 2: Diagrammatic Representation of Salmon’s Networked Learning Model



(after Salmon 2002)

COOPERATIVE LEARNING AND WORKING IN A VIRTUAL SETTING, A KEY COMPETENCE IN THE BOLOGNA PROCESS: THE CASE OF THE UOC

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Focus, research aims and conceptual framework

The focus of this research project is centred on learning methodology and co-operative work at the Open University of Catalonia (henceforth, UOC), an all online university. With the aim of understanding and systematising learning methodology and co-operative work in classes in a virtual university setting, the general objective of the project is: to develop learning and co-operative work methodologies in virtual university settings based on the description of current educational experiences, analysing the factors which intervene in the process, and the clarification of relationships and the discovery of underlying critical processes. The research questions which were formulated to fulfill the general objective are the following: 1. Why work and learn in a team in a virtual setting? and 2. How should learning and co-operative work in a virtual setting be undertaken? The information and knowledge era and the so-called "network society" (Castells 1997) are prompting educators to rethink the educational experience at a structural as well as conceptual level. That is to say, learning on and for the Internet forces a rethinking of the 'what' and 'how' of teaching and learning. It is necessary to revisit the question of what the needs and requirements of today's society are and especially to give an answer that is specific enough to permit the individual to participate actively and more critically and reflectively in society (Flecha 1999). Online education, which overcomes the barriers of space and time, should use and take advantage of Information and Communication Technology in the right way, and this will only be achieved by redesigning educational methodologies (Ferraté 2003). Methodological approaches should be based on flexibility, interactivity and co-operative learning on the Internet, given that the fundamental characteristic of learning is that it is carried out in co-operation with others (Harasim, 1995). "The added value in the coming years, based on information and knowledge, will be a learning environment which develops and encourages skills for collaborative thinking and learning" (Garrison & Anderson, 2003).

In this way the project aims to analyse the value and validity of collaborative work as a methodological approach to education within the context of a learning activity undertaken a virtual learning environment. We define a learning activity as any proposal based on an explicit educational intention, with references and contents relevant to the people it is aimed at, and in accordance with them, the project is undertaken within a given practical organisation able to modify itself via the full involvement of those learning and those teaching, in a common exchange of action and reflection (Rué 2002).

Methodological perspective

Due to the nature of the context in which the research took place and the research questions themselves, a qualitative approach, and more specifically case study analyses, were deemed the most appropriate in terms of methodology. (Stake 1999), *This qualitative paradigm attracts those who assume that reality is found in constant movement, that knowledge is understanding and that the aims of research should be in terms of an analysis of the processes (Goetz and LeCompte, 1988).*

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Research Scenarios

The criteria used to select the sample were the following: a) learning activities with various aims including co-operative work in a virtual setting; b) that information would be easily accessible to the research team, in other words that one of the heads of the activities were linked to the research project. From these criteria the following research scenarios were selected:

1. "Multimedia and Communication": a six month cross-discipline, introductory course for all new students who are accepted to study at the UOC. It provides students with skills and strategies for study and work in virtual settings and knowledge of various commonly-used software programs.
2. "Programme development techniques": a six month mandatory course in the Information Management Study Plan. This course is centred on the study of various strategies, representation of data in a computer using a programming language and the idea of an abstract type of data. The project which students carry out is on a very large scale and must be developed as a team.
3. "Computer Technology applied to management": a one semester core course which is part of the Degree in Computer Technology and Systems and the Degree in Economics and Business. It is based on the study of interdisciplinary cases which the students must resolve in teams with members from both degree programmes.
4. "Games with Flash": an optional monthly workshop from the Graduate Diploma in Multimedia programme in which a team makes a multimedia game on the web using the Flash 5.0 programme.

Of each of these learning activities three work groups were selected, which means a total of 12 groups analysed on the basis of the following selection parameters: a) that the teams have finished the project; b) that the members have a high and balanced participation in the group and c) that the work dynamic is observable and is recorded.

Design, data collection and analysis

According to Stake 1999, a certain period of research might focus more intensely on analysis than any other aspect, but analysis cannot be considered separate from the constant efforts to attribute meaning to the facts.

Therefore, on the basis of the methodological character of the study and its conceptual focus, in the following we explain the sources from which we have extracted the data, the methods used and the instruments created to collect and analyse the information.

Sources: Key Informants, Academic Documents, Virtual Spaces, Conceptual Focus Documentation

Methods:

1. Semi-structured interviews with key informants: students, advisor and instructor;
2. Collection and analysis of all the documentation given to students on group work: Work plan, theoretical document, practical organization guide, help material, etc.;
3. Observation: Messages from the instructor's notice board, files from the teams' work areas on the task carried out, information from the web pages created by the students.

Instruments:

1. Document of parameters to interview the advisor;
2. Document of parameters to interview the student;
3. Document of parameters to interview the instructor;
4. Category register for the observation of the virtual spaces on the management of the process and task resolution.

The analysis process consisted of the methodological *triangulation* (Stake 1999) of data. This process is characterized by its continuous evolution, dynamism and interrelation between the collection and analysis sources and the analysis sessions between members of the research team.

The fact that the analysis was done jointly, analysing the phenomena involved in the process, clarifying relations and discovering the underlying critical processes, permitted us to extract and illuminate those key elements which intervene in a co-operative work process in an online setting, in both the proposal and development, in an amalgam of evidence which affects both phases at the same time.

Discussion: Results and analysis

The research process carried out on the basis of case studies, permits us to expound certain relevant aspects of learning and team work in a virtual environment in the context of the formative university actions analysed.

The virtual setting acts as an anonymous source of information on the whole process of work and co-operative learning which the student is engaged in. As educators, as soon as we have the opportunity to know all the elements which constitute the mechanism of this process we can involve ourselves in each piece to achieve the desired result, or, in other words, the result which squares with the objectives and aims that the educational action originally intended.

Throughout this project we have been able to observe closely and systematise the complexity of the scenarios in which the methodological proposal for learning and co-operative work in a virtual setting (a term coined by members of the research team, see Guitert and Giménez, 1999) has been developed.

To give an answer to these basic research questions has meant discovering the complexity and the contextuality of our object of study.

We present below the principle results obtained and the conclusions and assessments which we have been able to issue based on those results.

Why of team work in educational proposals

The student on the Internet is not simply a passive receiver of the learning process but rather an active participant, who learns with the help of experts and colleagues situated in any place on the Internet. Conceptually there is a greater interdisciplinarity and flexibility for which new skills are necessary in order to work and learn in a co-operative way.

The consideration of the new needs to which the university education system, faced with the social and professional changes which are occurring, has to respond, leads us to the proposal of alternative pedagogical methodologies (McClintock 2000) based on new criteria which conform to the current educational landscape, in the Bologna line. Concretely there are two generic interpersonal competences in the European Higher Education Area: team working and ability to interdisciplinary team working.

In this context, and on the basis of the analysis of the Open University of Catalonia's varied formative experience, it is clear that when the educators from the UOC open a line of research to introduce co-operative learning methodologies on the web, they will take into consideration some objectives of certain nature and characteristics as a response to the needs which the university students of the current information and knowledge society have.

In the various cases, we have seen that the aims which led the educator to suggest co-operative learning and work in the class room operate on different levels. Some correspond to the desire to develop new didactic and organisational strategies, others aim to encourage social and motivational links, others create an approximation to the professional world. Some educators have considered that the latter option is a pedagogical concept which goes beyond a didactic instrument.

1. To develop study and individual work skills in a virtual setting, such as self planning and self organisation, in order to be able to work as a team.
2. To learn how to manage project development: plan, co-ordinate, share, reach consensuses and make decisions as a team.
3. To acquire team work strategies in a virtual setting on the basis of personal experience (learning by doing) so that it is possible to transfer these skills to other academic or professional settings.
4. To learn to use computer technology tools specific to teamwork in a virtual setting.
5. To put together a sizeable project in a team in a virtual setting.
6. To develop professional team work skills which are important in the work world of the current information and knowledge society.
7. To learn to work in interdisciplinary teams, sharing knowledge from various disciplines, a requirement often highlighted in the current professional terrain.
8. To encourage social links in a virtual setting.

The definition and realisation of these objectives permit educators to orient methodological decisions so the didactic operative which occurs in the classroom is coherent with the considerations from which co-operative learning and team work is the chosen pedagogical option.

How should learning and co-operative work in a virtual setting be developed?

The analysis of the development of the team work was carried out on the basis of 12 teams selected from 4 academic scenarios.

In accordance with the design set out for the data collection and analysis process, it is suggested that the development of a team project involves articulating and harmonising three essential features or aspects (Pereña 1999):

1. Technical dimension of the proposed task and the nature of the operation set out. To develop the task at hand it is necessary to apply the specific technical know how required.
2. Management dimension or variable: acts as a catalyst which allows all the elements intervening in the project to behave and act correctly. The management is a special factor which integrates and harmonises the use of the different resources and this variable is decisive and conditions the result which these resources can produce.
3. Social or human dimension: although it is not so obvious and often is not thought about, this dimension is always present and can condition the success or failure of the operation, given that the development of a team project involves a complex framework of personal relationships, where many different points of view and interests are at play.

It should be pointed out that the sociological, human dimension, which is directed towards the establishment of links at the social level between the members of the group etc., did not form part of our study objective in this project, as we did not want to digress to far from the focus of the analysis. However, we are not overlooking it and can identify it as part of the experience.

The research process carried out has revealed to us that, in a virtual setting the management variable acquires a very significant weight or value in relation to the other elements which intervene in the development of the project. Given that the process is carried out mainly a synchronically, this means that all the elements which intervene in the process must be managed and dealt with correctly. If not, the risk is that the students dedicate too much time to organisation to the detriment of the time that they should dedicate to the completion of the proposed academic activity.

This is evidenced by the following figures: in the 12 teams analysed, the percentage of messages exchanged that make reference to management aspects of the project constitute 50.4% of the messages analysed. 41.1% were dedicated to the preparation of the task at hand, and 8.4% represented content linked to the social relationship between the members, above all in the first year subject, Multimedia and Communication, the social links acquire much more relevance.

In this context, we continue to present firstly how the various management actions have influenced and intervened in the development of the team work analysed.

The Management action acquire a very significant weight on a team work process in a virtual university setting

All the actions which the students have carried out as part of the management of the team project in a virtual setting have been grouped together in 2 blocks: A) Organisation and Preparation of the project: planning, distribution of tasks and responsibilities, initial agreements and B) monitoring and closure of the project.

A. Organisation and Preparation of the project: planning, distribution of tasks and responsibilities and initial agreements

Analysing the various methodological proposals and the different groups on the basis of the established categorisation, we can see that in this initial phase we can group together the following activities: planning; identification and distribution of tasks; decision making process; initial agreements and information exchange; timing and conflict management.

All of these activities are carried out by the students in the initial preliminary stage. In any group work this organisational, preparation phase of the project has a relevant importance as expressed by Pereña (1996). The characteristics of a project necessitate a phase or a series of preliminary stages dedicated to the preparation itself, phases which have great significance to the good working of the project and these phases should be specially cared for. *"It is no exaggeration to say that the success or failure of the project is central in these preparative phases which some people tend to underestimate, as they are anxious to see the result too soon."*

The cases analysed have made us see that in asynchronous group work this stage is the most important. This means that at the time of carrying out the didactic proposal which includes teamwork in a virtual setting, we should be aware of the importance of the preparation and organisation and find tools for these stages.

In this initial phase, the activities to be carried out are:

Planning and timing: It stands out that in order to be able to plan and time the work correctly, it is important that the students have a view of all the activities to be carried out (PACs, stages, etc.) in each project. Hence, students should be aware of all of the activities from the beginning and know where they have to get to.

This permits them to organise the activities in the time allotted and predict how the work will develop throughout the given time frame. In some subjects the proposal includes a timeframe, in which the students can plan how to develop the work bearing in mind the personal availability of each one of the members and how to fit it all together in the team.

Task distribution: once they know the activities to be carried out and have planned how to do so, the students distribute the tasks that make up the project and the responsibilities amongst themselves. In some of the experiments analysed the students distributed responsibilities such as co-ordinator of a specific section, secretary, person in charge of contacting the instructor, etc.

In one of the cases analysed, the proposal offered to the student was closed as regards the timing and task distribution as the time was limited to one month. The educational proposal already laid out how the work should be structured in the time and what the principle tasks to distribute amongst the team members were. In this case, the students had no say in this element, as it was an integral part of the project itself and they just had to execute it.

Agreements: In those experiments in which the academic proposal suggested making agreements, the teams at the start established a series of agreements or internal rules and regulations in which working rules and criteria to be accomplished by all the members of the team were agreed to. In the majority of the teams, the agreements were in reference to:

- communication and exchange of information: the frequency of the connection of each member, answering time, waiting time of colleagues;
- decision making method: how to make the decisions: majority, consensus, via a co-ordinator, via synchronous ad hoc meetings, etc.;
- the task to be carried out: how to carry out the monitoring of the project, how to divide it up, how to let everyone know in a systematic way how things are progressing;
- use of virtual spaces: where to leave the work being carried out, who would update and organise each space etc.;
- prevention of conflicts: what to do if one member is not connected, what to do if one member gives up, how to deal with conflicts, etc.

In the majority of the proposals we have seen that the initial agreements or internal regulations were laid out and the students put them in to practice. A student commented on this:

"...As for initial agreements, you soon see that they are essential and if you don't have them from the beginning you'll need them later because they are necessary to regulate the process. At the beginning, when they tell you to make agreements it sounds like double Dutch and if you make these agreements just for the sake of making them, mechanically, you realise that they're not getting you anywhere. On the other hand, if you do them conscientiously, they salvage the whole process."

What is more, there is also evidence that making group decisions in the beginning about these aspects makes the work progress as normal, in an ordered fashion.

"...At the beginning there is disorganisation and chaos, and what happens? Well, you get down to trying to tidy up and organise everything for two or three weeks. Once you've got it all organised and the work's been shared out, then you can forge ahead..."

All in all, team work in a virtual setting, this initial preparation and organisation phase helps the subsequent project dynamic. Hence we have seen that it is important that in the various teaching proposals this aspect is examined at the beginning of the team work process. In the absence of this phase, in those subjects in which the methodology has not been thought of as part of the process and students have proceeded directly to the project itself, the need for some clear patterns from the beginning for the students to follow has been noted.

In those cases lacking in initial preparation we have seen that the team energy has been more channelled to the management of the process than to the contents, given that these aspects were perceived throughout the project and caused conflictive situations which slowed the team down and held up the work.

B. Monitoring and closure of the project

According to Germel (1999) checks are an aid consisting of examining a situation in order to highlight deviations from a given reference point, with a view to knowing where to apply corrective action. Controls are not to be applied only at the end but are a permanent process in the life of the project.

On the basis of the cases analysed, we can identify two levels of monitoring or control and closure in the development of a team work project in an academic context:

- Firstly, the monitoring of the students in the team and the monitoring carried out by the educator. In this case the monitoring was found to be linked to the process of continual assessment which is carried out in the UOC.

- Secondly, the closure which is carried out in the team by the advisor and the students. In this aspect, the actions which the educator carries out are also linked to the assessment, but in this case only at the end.

On the basis of the cases analysed, it stands out that if there is a planning proposal and explicit organisation in a subject, it is later more easy to be able to carry out internal monitoring by the members of the team and evaluate how the project is progressing in the light of the initial plan. One of the aspects observed in some of the teams which contributed positively to the monitoring by the students as well as the educator, is the fact that the planning and the initial agreements were written down. In these cases, this documentation acted as an instrument to review how the work and the team were progressing in the light of what had been agreed and forecast at the beginning.

What is more, at the rate at which the project progresses and is faced with the new needs of the group which arise, the planning and management of the group can be continuously reorganised and structured. *The organisation and monitoring of the group work has varied depending on factors such as: the experience of the group members in working virtually in a group, the predisposition of the members, the knowledge they have of the subject's contents, the evolution of the work… Moreover, this has varied throughout the semester depending on the experiences which have been had, new needs, etc.*

In those subjects where the teaching proposal itself sets up a monitoring and control system, this has allowed higher quality work to be developed and helped the students to acquire skills which allowed them to improve their work during the process and not have to wait until the end for a revision. It has to be pointed out that in those cases in which monitoring was not set out in the proposal, the students would either get lost and confused or would themselves give the project a system to control and monitor the work process, and/or they looked for an alternative, amongst which were periodical meetings, individual internal reports on how they felt that the group and the work were progressing, etc. In some teams, the members thought about the process once they had handed in one part of the project, one activity, etc. One student who had not had a planning proposal along with the teaching proposal commented that *"we lost work because we didn't know how to work correctly, because we didn't know how to conduct continual monitoring of the work which we were carrying out. When a problem came up we tried to find a solution and that's no way to carry out a project".*

With reference to closure and evaluation, in some of the cases analysed we have been able to observe that there can be a "double" closure of a team project: There is the closure achieved with the presentation of the completed product in the classroom and at the same time there is a group closure, with a personal self evaluation from each student to their instructor and a final group evaluation.

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VIRTUAL COLLABORATIVE LEARNING IN HIGHER EDUCATION AND ITS POTENTIALS FOR LIFELONG LEARNING – AN EMPIRICAL APPROACH

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1. Motivation and Objectives

E-Learning provides higher education institutions with new chances for international, interdisciplinary and intersectoral learning processes. With didactically accentuated learning projects in the virtual classroom it is possible not only to enlarge practical experiences in e-Learning, especially in enhancing traditional settings by blended learning concepts, but furthermore to provide a continuum between academical higher education scenarios on the one side and lifelong learning scenarios on the other side. Additionally, this continuum may pass from local/regional context to international and intercultural context and participants.

When discussing e-Learning, we have to take into consideration, if we focus:

- upon self guided (mainly individual) learning, based upon didactically accentuated online course materials to be delivered via complex Learning Management Systems (LMS) on the one side, or
- upon collaborative learning in small learning groups on the other side, based upon team work in asynchronous or synchronous mode to be supported by CSCW platforms.

To achieve learning efficiency, modern pedagogics recommend for both cases to draw on the constructivistic paradigm, taking into consideration the task of complex problem solving in situative learning environments, regarding the learner as an active participant, constructing his/her new knowledge and understanding in the context of the crucial relationship between new experience and what is already known, all based upon interaction with other learners and with tutors (Nulden, 1999). How to apply this problem-based learning approach on XML-based E-Learning content (focus 1), is discussed in (Klauser *et al.,* 2004)[1].

This paper concentrates on focus 2 – didactically accentuated collaboration in the virtual classroom. Following Nulden, a problem-based learning approach generally is characterized by the following items:

- The starting point for learning is a problem;
- The problem is the one that learners are likely to face in their present or future work environment;
- The subject matter is organized around problems rather than disciplines;
- The learners assume a major responsibility of their own learning and
- Most learning occurs within the context of small groups rather than lectures.

Following, we discuss empirical results of the last of a series of now 12 national and international collaborative learning projects in the virtual classroom. The discussed lessons learned are additionally supported by results of a success factors analysis. From our conclusions for further project settings we derive potentials for the adaption to lifelong learning scenarios.

[1] The research project IMPULS-EC was funded by the German Ministry of Research, no. 01 NM 067 D; for details see http://www.impuls-ec.de.

2. Conceptual Background

When concentrating on interaction and communication in learning teams in the virtual classroom, the question arrives, how to organize and to operate (also internationally and intersectoral applicable) virtual collaborative learning (VCL) on authentic case studies (in our context: e-Business scenarios)? In our VCL projects[2] we recognized that it is not sufficient just to provide collaborative information infrastructure for e-Learning communities, offering readings for download, and synchronous and asynchronous communication platforms – and then leave students on their own. If we want to achieve at least the same, if not improved learning efficiency in comparison with traditional learning settings, we need to take a more systematic and controlled approach. Therefore, in our opinion VCL is far more than just an open learning community. Based on our own findings, supported by numerous conclusions in scientific literature (e.g. Lipnack & Stamps, 1997; Palloff & Pratt, 1999), we developed a *conceptual framework* for planning, designing, preparing, operating and evaluating virtual classroom projects under continous moderation and reflection by trained teletutors.

Characteristics of our VCL approach are:

- Separation of collaborative projects into 5 phases with the teacher's decisions in each phase influencing later setttings;
- Formation of heterogeneous, self organized groups with 4 to 6 members collaborating on complex problems which have open solutions;
- Assignments embedded into an authentic cover story modelled as business case, the students to take over specific roles and achieve given tasks as collaborating teams;
- Evaluation of students based on a mixture of group achievement, individual communicative performance, role fulfillment and intra-group reciprocative assessment;
- Advance information of both tutors and students in forms of detailled guidelines, informing about the case, the roles, the tasks and the assessment criteria, and giving hints about potential drawbacks, conflicts and possible solutions;
- Application of intense tutoring in forms of coaching, giving feed-back and motivating, not influencing or teaching task solutions (Balázs & Schoop, 2004, pp. 75–85).

VCL projects following our framework typically last about 3 to 4 weeks, demand a high weekly workload from students (on the average 1 h per student and day for each team member; about 1 h per student and week for the coaching and assessing tutor), and may produce up to 1.000 and more qualified postings with significant (task relevant) content (20-30 participants in total). We tightly integrate VCL into higher education blended learning scenarios as a combination of classroom lectures, individual online learning, on site and virtual collaboration. Main didactical objective of VCL is the acquisition of additional competencies in three fields:

- Improved *professional competence* by knowledge sharing in heterogeneous groups;
- Improved *team competence* by deliberately following roles and scenarios, the interaction and communication following certain rules and standards and
- Improved *media competence* by having to rely upon internet technologies, and to cover up with its pros and cons while fullfilling tight project schedules.

We strongly believe these to be core competencies for students successfully passing higher education and starting to work in a business context similar to the former problem based learning scenarios.

3. International Virtual Collaboration – Some Lessons Learned

To enhance dependency on VCL and to focus on authentical problem bases, it seemed obvious for us to follow the European challenge, as outlined in the 'Bologna Process' towards the European Higher Education Area. This roadmap aims "[...] to establish a more complete and far-reaching Europe, in

[2] In the context of the named IMPULS-EC research project, we set up a series of deliberately varied settings of virtual classroom projects. The findings of more than 3 years of empirical research are summarized in (Balázs & Schoop, 2004).

particular building upon and strengthening its intellectual, cultural, social and scientific and technological dimensions" (Bologna Declaration of 1999, cited from Bergan, 2003, p. 241). It is recognized that "[...] the ways in which knowledge and skills are developed and conveyed are changing. [...] More education will be delivered through the Internet, through transnational arrangements, through a combination of traditional and non-traditional learning, and the recognition of various kinds of prior learning, including work-based and technology-based learning, must be improved." (Bergan, 2003, p. 176)

3.1. Short Review of VCL Projects' History

In accordance with the Bologna Process, our problem-based virtual collaborative learning projects (so far a series of 13 different projects from 2001 to 2004) were stepwise refined and enhanced in different settings. As shown in Figure 1, we collected experiences in VCL projects in the field of higher education as well as in lifelong learning contexts on different levels. The second dimension differs between locally allocated learning groups and geographically distributed learners. Each combination of these 2 dimensions is covered by several independent VCL projects. All were integral parts of concrete higher education or lifelong learning courses. Lessons learned from previous projects in the same basic setting lead to adaptive shifts in the single decision fields in the VCL framework, to be evaluated for possible improvement of performance and result. Thus we gained feedback for refining the conceptual framework.

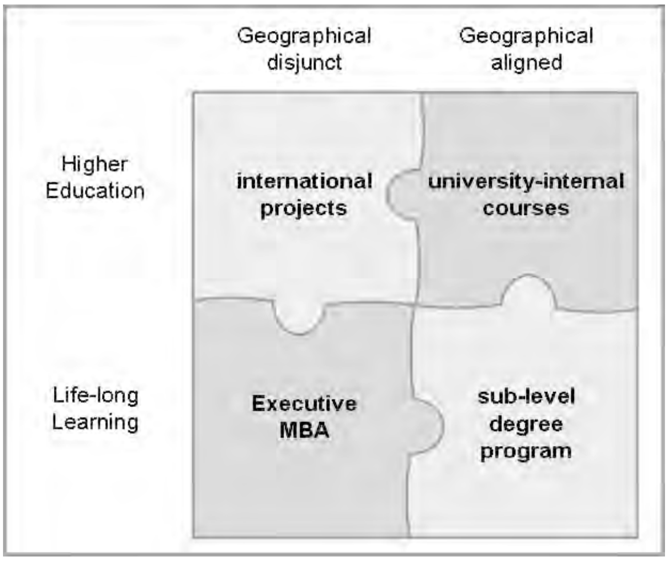

Figure 1. Dimensions of VCL Projects

3.1. Actual International VCL Project's Settings

The first VCL project (2001: Dresden and Szczecin) and VCL projects no. 12 and 13 (05/2004: Dresden, Kaunas and Szcecin; 11/2004: Dresden and Kaunas) enforced international collaboration (for detailed discussion see Schoop et al., 2004; Schoop et al., 2005). Projects no. 12 and 13 are to be discussed further in detail.

Project no. 12 was a tri-national VCL project, lasting for 3 weeks, consisting of 4 teams, each with 4-6 students mixed from participants of all three universities (Dresden, Szczecin, Kaunas), English as a common (and for all participants) foreign language. The students had to agree upon taking over certain roles, which had to be maintained for the whole project:

- Team leader – responsible for all team activities and collaboration control.
- Researcher – looking for suitable materials, making them available for the team.
- Critic – reviewing the research work and the team's performance.
- Writer – responsible for documentation of process and results.

Main objective of this VCL project was to create an IT strategy for given e-Business scenarios. These scenarios (separate ones for each team) had been created previously in VCL project no. 11, locally performed in 03/2004 in Kaunas, with the same students now participating in project no. 12 as 'domain experts'. They were completed by Szczecin students having been trained in on site lectures previously as 'IT strategy experts', and by Dresden students with trained competences in team collaboration and conflict management. The main objective was split up in weekly sub-tasks, represented by problem statements. The groups started each sub-task at the beginning of the week, having the whole week to find and document an appropriate (open) problem solution.

Concerning the too complex setting (students never having met before, VCL restriction to mere asynchronous and synchronous text forums, only 3 weeks of time in the middle of the semester, with outside duties further restricting the time budgets, and with different skills and learning cultures forming very heterogeneous groups), a lot of shortcomings had been expected in advance. Therefore, the outcomes were evaluated carefully, and based upon the results, deliberate adaptations and improvements were made as input for the next VCL project, the bi-national project no. 13 between Dresden and Kaunas, also performed in English language. Besides other, the following decisions were made:

- First, all participating students on both sites were better prepared on a common understanding of the professional aspects of the problem case to be solved (e-Business models). Before VCL, Dresden students started with individual online learning on problem based learning materials (ca. 30 h learning time), summarized by 3 on site lectures (both in German language). Kaunas students participated in a standard weekly on site lecture, given in English language. Thus, we deliberately abandoned the idea of complementary competences, which in the previous project had caused severe problems in understanding and in common decision making.
- Tutors decided to start with a 'live' kick-off seminar for better acquaintance (based on video conferencing). After 3 weeks of 'normal' VLC project the final work results were also presented via live conference, with each group's presentation split between the sites, and supported by a shared-application installation for .ppt & HTML presentations.
- This time, already ahead of the VCL project's start, a substantial task list was published. It allowed the students better to identify with their tasks ahead and to be conscious of the overall project's objectives already from the beginning, providing a complete overview.
- Tutors built the teams already before VCL started, based on CV sheets provided by the participants ahead, thus balancing different age, sex, professional and soft skills and individual interests and providing comparable, but heterogeneously structured teams. While in the previous project members within the teams rotated from week to week (to allow more participants and to reduce the individual work load), this time the number of participants was restricted to 4 teams, 6 persons each, 3 from Dresden, 3 from Kaunas, the roles split into 1 team leader, 2 researchers (one from each site), 2 critics (one from each site), 1 writer (opposite site of the team leader's site, giving 2 teams lead by Dresden, 2 teams lead by Kaunas student).
- The increase of the numbers of members within each group from 4 to 6 persons should increase productivity and keep the teams' progress steady even if one or two members should drop out for a few days. With only 4 persons in each group the performance might be better (faster decisions), but the absence of single persons in the previous project had proved to be a severe problem for the rest of the teams, as roles and competencies were fixed to persons.
- The crucial 'getting to know each other' phase and the time to get used to the technical platform was enhanced. The students got their logins already 10 days before the project officially started with the conference 'kick-off', and were supposed to get familiar with the environment, look around, publish their photo and their CV, which included personal interests and professional information.
- Last, the tutors rearranged the time schedule – in our last project we had a working week from Monday till Monday. To increase the communication flow it was decided to change for a weekly schedule from Wednesday to Wednesday – thus placing the weekend in the middle of the 'work week' – for individual research purposes and also to allow for relaxation.

3.3. Success Factors Analysis

To validate the success of our 'lessons learned' based adaptions (supplier's view versus customer's view), we conducted a success factors analysis[3] both in VCL projects no. 12 and no. 13. To achieve meaningful results in the VCL context, it was necessary to modify the method to our context. We substituted the field of information infrastructure by VCL and adapted the potential success factors based on our experiences with former VCL projects. The final results of our analysis demonstrate that our respondents confirmed our pre-selected factors and proved the applicability of the strategic success factors' analysis to identify the critical success factors, calling for necessary action to improve the conceptual VCL framework. These critical factors demonstrate the largest difference of suggested priority and perceived fulfilment in the concrete VCL project. A priority-fulfilment portfolio visualizes the allocation of the success factors to the key sectors (*ok* = balance on sub-average level, *success* = balance on above-average level, *waste* = bias to fulfilment, *killer* = bias to priority). In the following diagrams we've collected 6 factors (out of 28) from both projects to demonstrate the differences between both projects.

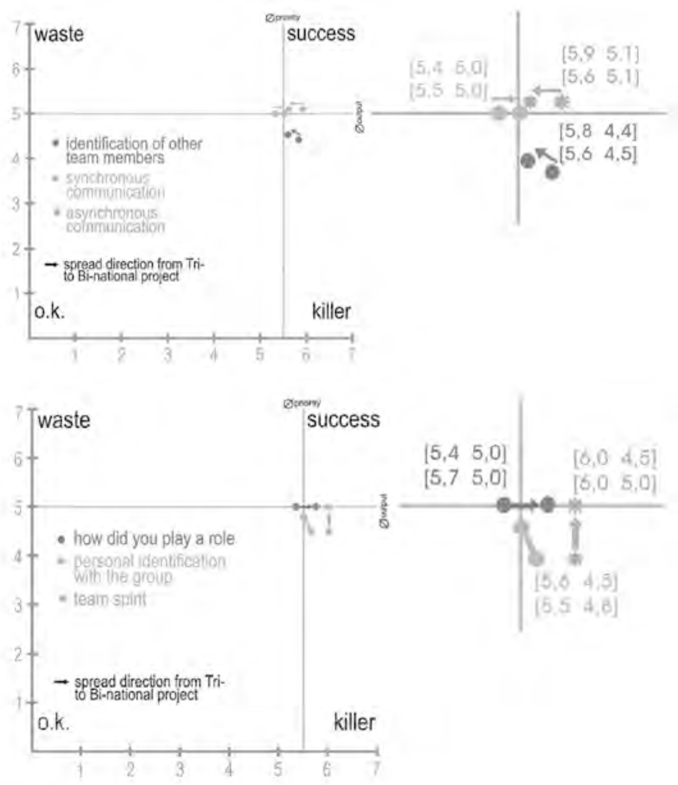

Figure 2. Some VCL Strategical Success Factors' improvements

4. Perspective: Potentials for Lifelong Learning

As potentials to be derived from successfully executed VCL in higher education for international and for intersectoral application we can summarize: if the knowledge sharing takes place in (internationally) mixed teams, besides the need for strong utilization of e-Environments, we can strengthen intercultural and interdisciplinary aspects of collaboration. If we furthermore import professional expertise by integrating representatives from 'real world' scenarios into higher education VCL, not only the authenticity of the problem base and the professionality of group performance and results are likely to improve, but also important first steps are done on the roadmap for lifelong (intersectoral) learning.

Dresden University of Technology currently exploits VCL projects in higher education on a standard base in different courses (i.e. Information Management, Business Pedagogics). Vilnius University MBA program to start in autumn sem. 2005 will include VCL syllabus into its list of selective subjects. The

[3] Method developed by Alloway to support strategic IT-planning (Heinrich, 2002, p. 382).

further extension of VCL also to Kaunas Technological University is in progress, thus making use of the excellent technical conditions provided by its Distant Learning Center. An actual joint EU Tempus Tacis project application (partners: Dresden, Kaunas, St. Petersburg) carries these ideas on. It focuses upon integrating business experts into international higher education VCL teams, creating more authenticity of the problem base (e-Government context with municipalities ready to join), improving practical orientation of higher education, modernizing administrative processes and create an awareness in practice for lifelong learning.

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CROSS-INSTITUTIONAL TEAM TEACHING AND COLLABORATIVE LEARNING IN AN ONLINE COURSE

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Introduction

Preparing teachers to teach in the 21st century should include E-teaching and E-learning as well as first steps for lifelong learning and professional development. The online course described in this study has the potential to promote these qualities.

The course is designed for students in a teacher education program of two education colleges in Israel, located in different areas, far away from each other. The students of the 2004/2005 course made a heterogeneous group of learners: they live in big cities, or small towns, or in Bedouin villages; their age range was 22-48; some were single, newlyweds and others had families and children; there were pre-service and in-service teachers; some had vast technological and digital knowledge, but others had poor knowledge or even technophobia.

The main objective of the course "ICT in Teaching and Learning" was to get to know the potential of ICT in education, by experiencing learning in a technology rich environment and reflecting on the process, and by reading the latest theories, research and application modes of e-learning and computer supported collaborative learning. The learning management system used consisted of a variety of information and communication tools, specially developed for adults using e-learning.

Course design and procedure

The course "ICT in Teaching and Learning" aims at developing students' expertise and professional roles as teachers. According to Zellermayer *et al.* (2004) teachers in the twenty first century ought to be "learners, users of technological tools, co-learners, re-affirmers or rejecters of e-learning projects and change leaders" (Zellermayer, Mor and Heilweil, 2004). They have to be lifelong learners as well, as all professionals in our age. The current course provides training and modeling as learners, as co-learners, as lifelong learners, as users of technology, and as change leaders.

The constructivist collaborative environment framework has been applied to an e-learning course, supplying information and communication tools as well as a live model for how these tools can be used to. It includes an information center, a series of guided tasks (individual as well as team work) and a communication center. The information center contains a relevant reading and guidelines for searching additional ones. The communication center contains synchronous and asynchronous tools, to be used in both according to course demands and according to individual academic and social needs.

Teachers' perspective

The current course "ICT in Teaching and Learning" had a double, though contrasting, potential: it was a challenge to team-teach a multicultural group of students from various locations, but it was a high-risk adventure to lead a peaceful effective course (for the first time) with another teacher vaguely known as a colleague.

Team teaching is often used to describe the situation in which two teachers combine classes and share instruction (Cook 2004).

The team teaching process developed step-by-step: It began with the preliminary steps of organizing the course, continued with the actual everyday online teaching according to plan and changing plans according to needs, and came to an end when analyzing the process of learning and teaching and assessing the course.

1. Preliminary steps: organizing the course

In this phase we focused on three main components: the syllabus, the LMS platform and our own ways of communication. Very soon the differences in our individual preferences arose:

- The syllabus: choosing contents and bibliography and building tasks was mainly in agreement, after a short negotiation, mainly as a result of mutual respect and readiness to learn from each other.
- The LMS platform: we chose one platform, although each one of us (teachers) is an experienced online teacher with his own preferences concerning effective and comfortable teaching platforms. In order to Co-Teach and learn together we needed one working site, but we never stopped questioning the quality and features of some of the chosen tool (example: forum).
- Communication mode: all means of communication were used (F2F meetings, telephone conversations, e-mail) although one preferred oral communication and the other the written one.

2. Online team teaching

The second phase lasted about three months, and was characterized by full partnership and collaboration. Every notice, e-mail, new forum opening or closing, changing students' tasks or time-table was discussed and elaborated until arriving at an agreement. Spontaneous responses in the forum and feedback to tasks were not discussed; thus sometimes disagreements occurred. Nevertheless no opposing opinion was sent to the forum/students. It was discussed, and sometimes disagreements remained. A series of questions accompanied this phase:

What is the role of each one of the teachers? Is there a specific unique task to each one of us? Do we answer to the students/messages? Is it good/important/unnecessary to express our different opinions? How much flexibility is needed?

Student attitudes on learning strategies of the course

The students' attitudes were determined by the following methods: content analysis of the forums which were intended to stimulate reflection on the learning methods of the course, face to face and telephone interviews with students, a questionnaire with classification questions as well as open questions. The findings presented in this paper offer a sampling of these responses:

1. *The quick and useful reactions of both lecturers to student needs during the course.* This point was raised by the largest number of students in the forum as well as in the open questionnaire. The students emphasized one of the greatest advantages of this course – the presence of two lecturers from two different institutions. This was noted as significant in the support and assistance in student learning, both in the emotional (affective) and the cognitive domains.
2. *The large variety of viewpoints, opinions and positions that were expressed during the debates and dialogues.* Most attributed these differences to the composition of the participants in the course, the integration of two colleges from distant geographical areas, different student populations, cultures, religions (Muslims, Jews and Christians), peoples (Jews and Arabs), as well as large socio-economic gaps. In addition, differences in age and work experiences existed. During the course, friendships between participants from different places were created while doing assignments together. This point was emphasized by some of the students. Feeling part of local events, that is of events reported in the news (like the wave of locusts in the area of Eilat in southern Israel) on the one hand caught the attention of the whole country and, on the other hand, the participants from Eilat reported on what was happening right from their homes in real time. Knowing what was happening in the southern part of the country in real time and from other course participants was noted positively by students from the Tel Aviv

area (a city in the center of the country). It is worth noting that the students attributed a positive value not only to the contents and formal subjects of study but also to the seemingly informal learning areas of study. By this we mean learning which takes place by sharing experiences that are not necessarily directly connected to the formal contents of the course (i.e. those written in the syllabus and planned by the lecturers). Great value is attributed to learning through sharing experiences.

3. *Acquaintance and experimentation with technological innovations.* As was stated previously, the group was heterogeneous in its exposure and experience of teaching and learning via the net. There were participants for whom it was the first time they had taken an e-learning course or were exposed for the first time to the varied toolbox of means of learning on the net. The acquaintance with the learning environment of the course and the new things that the students learned characterized a part of the positive reactions to the course. The integration of technologies like the synchronous system of Interwise (a system which enables spoken conversation during the presentation of joint activities on the net – like participation in a poll and the immediate presentation of the results), experiencing learning methods which were not previously familiar to them and the feeling of self-efficacy came up in the interviews and questionnaires as an important motivational component in the eyes of the students. Self-efficacy is directly connected to one of the characteristics of life long learning skills, that is, the belief in the ability to use technology as a part of the repertoire of life skills that an individual uses during his life to get information and to acquire knowledge.
4. *Relevance to the professional life of the learners.* There were postings that pointed to the relevancy of what they learned in the course to their professional lives. Some students noted that they took activities they did in the course as a model for things they applied in their teaching at school. Others, who have not yet applied the new skills noted in the interviews and questionnaire that they were planning to use it in the future with their pupils at school.

Problems, difficulties and doubts

1. Workload – the most frequently mentioned problem was the workload that a course such as this imposes on the learners. There are numerous postings on this topic.
2. Technical problems – mostly concerning the slow pace of the Internet or problems of accessibility to certain components of the online system.
3. A few students noted that they did not like participating in the social forum (*"There is life on the Net"*) either because participation in this forum was mandatory or because of their lack of interest in having interactions of this kind.
4. Lack of interest in the subject matter of the course – one student noted that the subject of the course did not interest her (she took the course by default), but noted enthusiastically that the course gave her confidence in her ability to use the Internet for personal and professional purposes.
5. Lack of face-to-face contact with classmates – one student noted that the "anonymity" of her peers, the fact that she never met them face to face, bothered her.

Summary, conclusions and future perspectives

A cross-institutional course is suitable for creating a wide framework for multicultural participants since it invites learners with a range of opinions, ideas and life experience and from different places to a common online environment. The Internet environment is characterized by its variety of users, resources available and thus is suitable for life long learning. Therefore, teacher training in an online environment contributes to the participants teaching skills, application of this approach to their work at school and to life long learning.

Team teaching significantly diversifies the perspectives presented to the learners, contributes to their motivation and serves as a modeling for teaching, while at the same time emphasizing close cooperation between the teachers. In the case of teacher training, this is likely to be modeling for the professional life of the teachers at school and thus to influence the life long learning skills of the learners, at least from the point of view of their professional lives.

Learning through sharing the experiences of peers was an outstanding feature of the course and many learners noted this as a central feature in their learning. Learning from the experience of others is also an important component of lifelong learning.

Informal learning characterizes the life long learning approach (Smith 1996, 2001). Even though the course was given in the framework of formal studies, events occurred which resemble informal learning.

The course was characterized by many reflective processes like the use of self-evaluation rubrics and assignments which demanded thinking about the process of learning that the students themselves underwent. In our opinion, the ability of the students to reflect on their own learning gave them an important tool in the repertoire of learning skills they have acquired and will use while navigating the path of life long learning. We could ask ourselves how deeply this component has penetrated and will be applied over time. This must be checked in additional studies. As in every learning process, it is important that the reflexive processes exist in other courses so that the ability to reflect be sustainable in the culture of the teaching profession. The ability of reflexive learning is emphasized in the approach to life long learning (Chapman *et al.,* 2003).

We found a high level of satisfaction with the course from the questionnaires and interviews conducted. Concurrently, however, in the reorganization of the course for the upcoming years, we will have to find a solution to the problem of the work overload which was brought up by a number of learners. We must improve parts of the learning interface by making them more use friendly. The problems of rapid and easy accessibility to learning resources will certainly be solved due to improvements in technology and in the existing network infrastructure. The impact of what was learned in the course will no doubt be felt in the future, not only in connection with their professional work, but also in their private lives as life long learners.

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COLLABORATIVE LEARNING AND GAME-BASED SOCIAL SIMULATIONS IN NETWORK-BASED EDUCATION

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Abstract

This presentation discusses the case study which aims to analyze teachers' and students' conceptions about pedagogical models which support the use of collaborative learning and game-based social simulations in network-based education (NBE). The models used for designing, implementing and assessing the case study are the Group Investigation Model (Sharan & Sharan 1992) and the Learning Through Simulations Model (Joyce *et al.,* 1997). The research questions focus on analyzing i) how the collaborative and game-based pedagogical models function in NBE, and ii) what kind of support teaching and guidance process will need in NBE. The research design is based on a qualitative approach, complemented with ethnographic study and participant observation in addition to thematic interviews and web-based questionnaires. The quantitave statistical analysis and qualitative content analysis were used to analyze collected data. This case study is conducted in cooperation with the Finnish Defence Forces and their course in pedagogy and leadership for young officers, and with their business partner R5 Vision's (Tieturi Vision) concept and product development process. A summary of the preliminary findings regarding the analyzed course will be discussed. This case study is a part of the MOMENTS Project and the Academy of Finland 'Life as Learning' research programme.

Introduction

This presentation discusses the case study which analyzes the pedagogical models in network-based education (NBE). When discussing the development of NBE, a special area of interest is to understand how pedagogical models which utilize and support collaborative learning and game-based social simulations can be combined in teaching-studying-learning (TSL) process. The study aims to understand, how these pedagogical models can support teaching and guidance in the network-based environments. The case study is part of the MOMENTS research project ("Models and Methods for Future Knowledge Construction: Interdisciplinary Implementations with Mobile Technologies"), which aims to model future needs of the teaching-studying-learning process in network-based education (vrt. Uljens 1997; Kansanen *et al.,* 2000; Tella 2003; Tella *et al.,* 2004).

Theoretical Background

The significance of communal modes of learning and studying on the network-based environments has the special emphasis in this study. According to Vahtivuori, Wager and Passi (1999, 265–278) communal learning and studying can be understood as a philosophy of interaction and as a collaborative process of inquiry and problem-based experiential learning. During the collaborative studying process, the importance of interaction, investigation, intrinsic motivation and interpretation as a social activity should also been emphasized (Sharan & Sharan 1992). The network-based environments can offer good prerequisites for collaborative TSL process, e.g. each action of the user leaves some sort of "media trail" in the material or the environment, which other users can utilise either at once in real time or later in their own learning. Recent studies have shown that communal TSL can be applied successfully in network-based learning environments. Also some problems and future challenges are reported, e.g. concerning time management in the net and the level of commitment of students (e.g. Gell & Cochrane, 1996; Hakkarainen ym., 1998; Aarnio 1999; Vahtivuori, Wager & Passi 1999, 265–278; Häkkinen, 2002; Lipponen 2003). (See Vahtivuori & Masalin 2000; Vahtivuori 2003)

Games, narratives, simulations, experiments and learning-by-doing, are often seen as important components of purposive TSL process. The creation of experiences in NBE seems to be at least as important as in face-to-face TSL process (Ackermann 1994; Jonassen 1995; 2000; Boud & Feletti 1999; Vahtivuori & Masalin 2000). With the aid of game-based simulations the level of interactivity, experiential learning and communal modes of studying can be increased. (Tella *et al.,* 2001; Vahtivuori & Masalin 2000) TSL process on network-based environments can take real advantage from game-based pedagogical ideas and models. Immersion of the simulations and game-based thinking and activity can make TSL process in the network-based environment more experiential. (E.g. Tella *et al.,* 2001) As its best, a network-based course and TSL process can be a social simulation or a narrative about an interesting and relevant subject. (Vahtivuori 2003). Social simulations make possible to understand complex real life problems in a safe but realistic studying situation (Duijn *et al.,* 2003; Daré & Barreteau, 2003; Smith, 1999).

In this presentation simulations and games are understood as social simulations, imitating and modelling of a real life collaborative situations. These social models can act as some kind of ideals and logical and emotional frameworks for real life problems. The term used is game-based social simulation (see also Brougère, 1999; Corbeil, 1999; Dasgupta, 1999; Ruben, 1999; Vahtivuori & Lehtonen, 2003; Vahtivuori, Torkkeli & Lehtonen (in process); Järvinen & Mäyrä 1999). Collaborative learning and game-based social simulation models are analyzed in the framework of MOMENTS project integrated multidisciplinary pedagogical model. (Vahtivuori & Lehtonen, 2003; Lehtonen & Vahtivuori 2003; Tella ym. 2004; see also Uljens 1997; Kansanen *et al.,* 2000; Hautamäki, J. *et al.,* 2002)

In this case study two pedagogical models are used for designing and implementing NBE, the pedagogical Model of Studying Through Simulations and the Group investigation Model. (Sharan & Sharan 1992; Joyce *et al.,* 1997, 130; Vahtivuori 2003). The phases and the key elements of the simulation model according to Joyce *et al.* (1997) are following:

- Orientation (overview of simulation, broad topic, concepts, explaining simulations and games);
- Participant training (setting up scenario, rules, procedures, roles, scoring, goals, types of decisions to be made);
- Simulation operations (conducting game activity and game administration, obtaining feedback and evaluation, clarifying misconceptions, continuing simulation);
- Participant debriefing (summarizing events and perceptions, difficulties, insights, analyzing process, comparing simulation activity to real world, relating simulation activity to course content, appraising and redesigning the simulation).

The second pedagogical model used is the group investigation model. The key elements of this model are investigation, interaction, intrinsic motivation, and interpretation (Sharan & Sharan 1992, 18). The phases of the group investigation model are following:

- Students encounter puzzling situation;
- Students explore reactions to the situations;
- Students formulate the study task and organize for study (problems, definition, roles, assignments);
- Independent and group study;
- Students analyze and interpret progress and process;
- Recycle activity (Sharan & Sharan 1992; Joyce *et al.,* 1997, 102).

Research Tasks and Questions

The above theoretical discussion will lead to the following research questions:

- How the pedagogical models utilizing collaborative learning and game-based social simulations function in network-based education?
- How teaching and guidance can be supported with the aim of these models?

Methodology and Data Collection

The research design is based on a qualitative approach, complemented with ethnographic study and participant observation in addition to thematic interviews and web-based questionnaires. The data is gathered from the Finnish Defence Forces' Defence College course in pedagogy and leadership for young officers (N=28). The course was flexi-mode network-based course, where students solve group investigation tasks and played game-based social simulations and create their own problem-based cases with the help of the teachers, using digital source materials, videoclips, discussion forums and chats for communication and using data bases and portfolios for collaborative knowledge construction. The research questions will be answered by observing, documenting and analyzing the students' and the teachers' action and communication in network-based environment. The qualitative content analysis and statistical analysy are used to analyze the data of the case study.

The Finnish Defence Forces provided a versatile opportunity to experiment and understand the situation where TSL process is combined in studying and working life context. As an educational organisation the Finnish Defence Forces has large number of students in the master program of military sciences for young officers, and there is a crucial need to develop educational culture and new pedagogical models towards more student-centred orientation. Problem-based approach and real life cases have been lately taken as the starting point of the studying. The working context of the Defence Forces enables all the students to have personal experiences of the learning contents, especially of leadership and pedagogy. Young officers are present all the time and surrounded by different leadership and educational situations. That is why it is quite easy for them to take different roles, create real life cases and game-based social simulations and reflect them while studying these topics from a theoretical perspective. It is interesting to study how it is possible to bind traditional pedagogical culture, based on teacher-centred approach and face-to-face teaching in classrooms and student-centred approach with the use of collaborative and game-based pedagogical models.

Some Pilot Findings

The pilot findings from the case focus on teachers' and students' conceptions of the used pedagogical models, teaching, studying and guidance process in the network environment. The findings of the case show that successful use of game-based simulations in NBE needs a proper and strong orientation phase. The role motivation of the students was found to be important. Explanation of the simulation process should be emphasized in the beginning of the course. According to the teachers, the use of the pedagogical models supported them to organize and guide TSL process in network-based environments. In students' opinion, the group investigation model, collaborative modes and practices of studying suited well for studying leadership. Collaborative modes of learning seemed to increase studying motivation. Social relationships and former experiences of the students affected the success of the social game-based simulations.

This case study is conducted in co-operation with Finnish Defence Forces' National Defence College and with a business partner's R5 Vision (Tieturi Vision) concept and product development process. The R5 Portal is used and analyzed as a network-environment to support the use of collaborative learning and game-based social simulations TSL process. The outcomes of the study are pedagogical models and practical principles, which will help teachers and students to teach and study in network-based environments. The study will contribute to the development of novel teaching, studying and learning and working methods of NBE.

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EXPERIENCES AND ANALYSIS OF NINE ONLINE COURSES MORE COLLABORATIVE LEARNING WANTED

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Introduction

In this paper we discuss the first experiences of the process of expanding a secondary education school network through online teaching and in-service training. The context of this research is the Eastern Finland Educational Network Project (later referred as ISOverkosto), which is a network of 36 high schools providing courses via web-based learning environments (Virnes & Suonio 2004). The ISOverkosto project has a core group of eight mainly adult high schools which act as an expert group of distance teachers. Their online teaching skills and web-based courses are spread out in this project for those high schools which do not have so much experience in web-based education. There is an ongoing renewal of curriculum of highschools in Finland and therefore many of the previously conducted courses have to be revised. It is to some extent due to the revision of matriculation examination that many small upper secondary schools are forced to include advanced level courses for small groups of students and therefore external recourses are needed in order to fulfil this demand.

In this kind of network of educational institutions there are persons involved in many levels of use of innovation from the preparation stage to the renewal (cf. Jennings & Dirksen, 1996). Our role in this process has been twofold, firstly we have organised in-service training for teachers at these different levels and secondly we try to conduct design research (Bereitter 2002) in some areas of this ongoing work.

In this paper we describe nine upper secondary school online courses that were accomplished in web-based learning environment called Moodle. In this case these courses also served as piloting environments for quite a many high schools which are adopting web-based teaching as a part of their educational activities. In these so-called Training Online Courses beginner online teachers operated as a co-teacher or local tutor and were thus made familiar with teaching and learning online.

Teaching and learning in web-based learning environments

Nowadays the research concerning use of information and communication technology in teaching and learning e.g. in web-based learning environments, are usually associated to the idea of computer supported collaborative learning (Harasim 2000, Koschmann 1996). Computer supported collaborative learning (CSCL) stress peer interaction, sharing and distributing of knowledge and expertise among members of course (Lipponen 2002). CSCL is based on the idea that with computer applications we can scaffold and implement advanced socio-cognitive processes for knowledge sharing and knowledge building (Paavola *et al.,* 2002). According to these ideas the most important role of the web-based learning environment is to support teachers and learners interaction to construct knowledge and reflect learning.

In addition to CSCL there are a few other models concerning teaching and learning in web-based learning environment. Manninen (2003) demonstrates four different models for using web-based learning environments (Figure 2), ranging from self study courses to collaborative courses. Also Hatakka & Valtonen (2004) have demonstrated three different pedagogical models based on different learning conception, ranging from teacher centred models to more learner centred models.

Methods

In autumn 2004 ISOverkosto Project offered ten free of charge online courses for the participating institutions. In this paper we describe analysis of nine high school courses produced and conducted in ISOverkosto. One course with only one distant student was left out of this analysis. The courses were accomplished in web-based learning environment called Moodle and they were taught and designed by nine distance teachers. The analysed courses were: language courses (4), history, geography, biology and religion (2) courses. The number of participating students in these courses varied from four to 24. In addition to the senior distance teacher who was responsible of the content and assessment, there was a local beginner online teacher who tutored the students locally. The local tutors counselled and guided learners and sometimes also arranged face-to-face meetings. Tutors were a kind of mediating persons between learner and distance teachers. Each learner had locally one tutor, though one tutor usually had more than one learner on his/her responsibility.

For the analysis purpose each of the accomplished courses were first analysed using a slightly modified pedagogical evaluation form adopted from ETÄ-KAMU project (Ruokamo & Pohjolainen 1999). The attained results were combined to three themes: the structure of the course, learning, and collaboration. These aspects were also compared in the different pedagogical models demonstrated by Manninen (2003) (Figure 1). In the next section we introduce the main features of the analysed online courses concerning the structure of the courses and learning and collaboration in the courses.

Structure of the courses

Teaching and learning in web-based learning environments is preferred very learner centred; learners are responsible of their own work, they search, evaluate and construct knowledge collaboratively with other learners. Teachers' role is mainly to provide materials, guidance, frames and also expertise to support learner's work (Manninen 2003). In the analysed nine courses teachers had designed the courses very strictly before the course began, so the learners role was mainly to follow the instructions and learning material provided by the teacher. The structure of all nine courses was very clear and easy to follow. The pedagogical idea behind the courses resembled Gagne's (1990) design models. The target knowledge or skill of the course was divided into topics so that each topic consisted of guiding materials for learning and references to textbook, materials presenting essential themes and facts and also learning tasks. Usually there were also asynchronous conversation forums and learning portfolios (Figure 1). The role of the learner was to proceed through the topics in teacher-defined order by studying the learning materials and accomplishing the learning tasks.

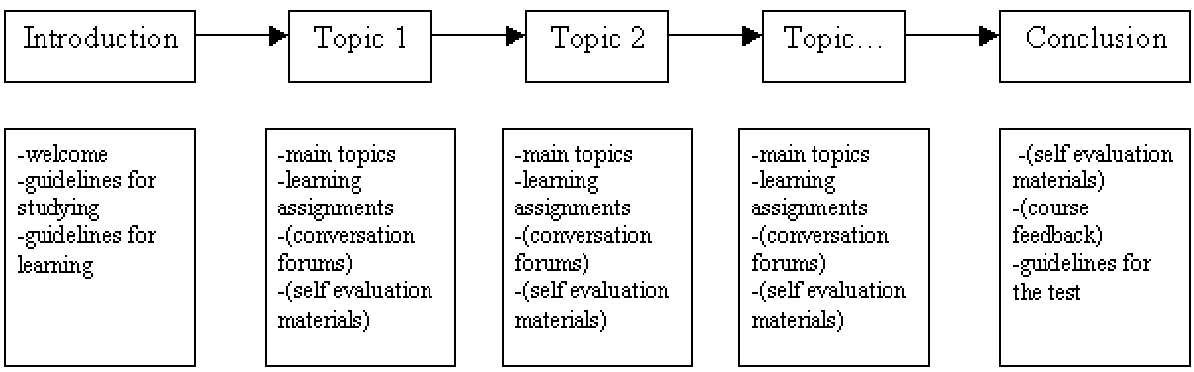

Figure 1. Structure of the courses

Learning

Manninen (2003) describes four different ways of teaching in web based learning environments (Figure 2). The differences are based on different roles of teacher, learner and learning materials. In the first model the learning process is very well guided process by teacher and learning materials. The structure of the course reminds normal contact teaching where teacher controls the learning using learning materials. The second model is based on discussions. Teacher and learners are actively involved in learning process using asynchronous discussion forums. Teachers' role is important in guiding learners to think and in helping learners to reflect their ideas and learning experiences? Model three consists basically of self-study learning materials. The learner follows ready-made materials involving guides concerning what and how learner should learn and also the materials to be studied. The fourth model is a learner centred model where the learning materials and teachers are only supporting the learning process and the learner groups themselves are responsible for the learning results. (Manninen 2003)

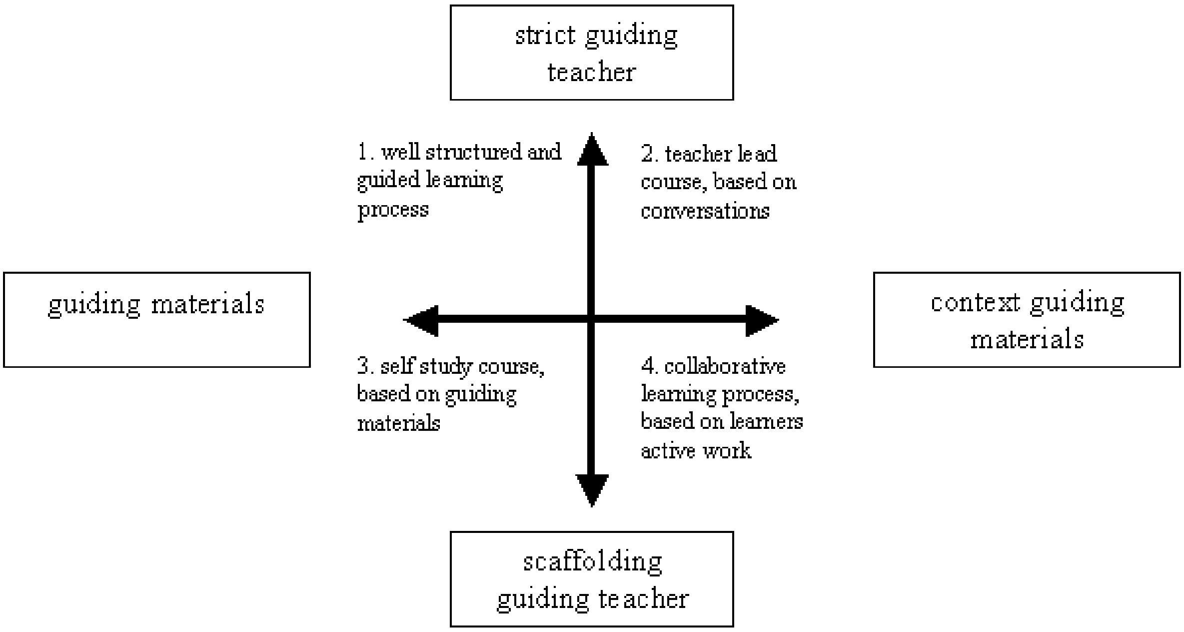

Figure 2. Ways of teaching in web based learning environments

The analysed nine courses were mainly designed according to the model one (four courses) and the model three (four courses). Only one course was based on the model two (philosophy course), and none of the courses were designed according to model four.

The courses resembling model three were designed to base on use of guiding materials, so that learners could study the text book and other materials in learning environment mostly by themselves. The course materials were designed to offer strong scaffolds, these materials guided learners to focus on essential points of the topic. Teachers' role was mainly to prepare the environment and the guiding materials and provide support and feedback only when required. These online courses did not contain any discussion forums for studying purposes.

Courses resembling model one were quite close to courses using model three. The main difference was in the role of teachers. In these four courses the teachers were more actively involved in course activities. Teachers provided actively feedback to learners, supporting pupils to fulfil assignments, in discussion forums. The discussion messages were usually very short excerpts, containing only a few discussion issues (see table 1, biology, geography, religion). Discussion messages were kind of learning assignments where teacher asked and the learners answered. These courses also had a very clear pre-planned and easy to follow structure containing a lot of guiding materials.

The philosophy course was similar to model two and mainly based on conversation. The conversations were led by the teacher who guided learners to reflect their own conceptions, construct new knowledge and evaluate and create new materials. The learners were actively involved in the learning process, presenting their own ideas and commenting other learners' ideas. The ready-made learning materials were mainly used to build the context for the conversations.

Collaboration

Eight out of nine courses resembled models one and three. In these courses learners studied the materials and accomplished the learning tasks by themselves. The interaction during the courses consisted mainly of assignments and teachers feedback for the assignments. The peer interaction part was minor. Only in course similar to model two contained peer to peer conversations and focused on collaboration.

There were three different ways to use discussion forums. The first way of using the forums was mainly to support building up the online community, the conversation themes were loosely connected to the topic and the main idea was to become acquainted with other students. The length of the discussion thread varied quite much from 0 to 13 notes (see English and religion in Table 1).

The second way to use discussion forums was to return the learning assignments. The conversation topics were usually questions, the students simply answered to the question and finally teacher gave feedback. The interaction between students was minimal and the discussion threads were quite short (see geography and biology in Table 1).

The third way to use discussion forums was more focusing on construction of knowledge based on peer interaction. The discussion threads were longer than in other courses (see philosophy in Table 1) and students commented on topics and introduced new issues. Conversations resembled argumentative conversations where learners commented each other's opinions and argued their own opinions (Marttunen & Laurila 2001).

Table 1: Use of discussion forums

Course	Forums/topics	Notes/topic	Altogether notes	Announcements by teacher
biology	7	0,4,1,0,1,1,3	7	2
English	10	10,3,0,13,8,2,3,7,0,0	46	5
philosophy	28	6,3,5,0,10,2,8,5,4,1,1,4,3,0, 6,14,7,0,7,1,2,1,2,4,4,3,5,2	110	2
Finnish	1	0	0	0
Finnish as second language	6	0,2,0,6,4,3	15	0
Germany	1	0	0	8
geography	5	1,0,3,0,2	6	27
religion	7	0,4,0,3,3,2,0	12	1
history	1	1	1	0
		2.711		

Conclusion

The analysed coursed utilised mostly direct teacher centred teaching methods. The structures of the courses were very strictly predefined and easy to follow. Learners were supposed to proceed through teacher-designed learning trait by utilizing teacher's support, guiding materials, learning materials and text books. As mentioned by Matikainen (2003) teaching and learning in web-based learning environments resembles usually strongly ordinary teaching and learning methods at schools, which in this case was similar to highschools' working practice. Also teachers' own conception of learning controls the use of the web-based learning environments. Compared to principles of CSCL and ways to use web-based learning environments to support collaborative knowledge construction, these courses emphasized self-paced studying with minimum peer interaction. Teaching methods based on collaborative knowledge construction were not so popular in the analysed courses. Such methods might be harder to implement and the students do not easily start to use the online environment in that manner either.

The lack of collaboration and peer-interaction was compensated mainly with tutors who supported learners and also arranged meetings where learners could share their experiences and get feedback for their work.

Guiding and easy-to-follow course structure worked well and provided a safe way to study for high school students who were used to work independently. Learners' habit to study alone appeared especially in conversations. Learners did not participate conversations unless the participation was either compulsory or gave extra credits for the final evaluation. Conversations, especially argumentative conversations calls for skills that have to be practised (Marttunen & Laurila 2001). Argumentative conversations were used only in one course whereas in other courses conversations were mainly used for expressing own ideas without commenting others messages, this feature has been recognized before (Matikainen 2003). Learner-centred, active and interaction-based learning calls for practise for becoming used to it. According to Kuusinen (2001), the learning models that learners get from Finnish schools stresses independent working which does not fit in collaborative learning. The model has to be changed and the members of the learner group have to plan and practise collaborative learning methods especially when utilising web-based learning environments.

The results of this paper will be used as a basis for distance teachers' development. The goal is to find ways to support and encourage also more open and collaborative learning in next online courses. Especially the role of conversations will be placed in central position. Changing the teaching and learning methods from a teacher-centred to a learner-centred at once has proved to be a challenging and time consuming task (Glasson & Lalik 1993). Being conscious of this we try to find ways to support progressive proceeding toward more collaborative teaching and learning methods. The aim is to use small collaborative units to assimilate the principles of computer supported collaborative learning for teachers normal way of teaching. These units, e.g. different conversation exercises, collaborative writing etc, should work as an example and practise of collaborative learning for both teachers and learners.

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E-PORTFOLIOS IN THE NETHERLANDS: STIMULUS FOR EDUCATIONAL CHANGE AND LIFELONG LEARNING

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1. Introduction

In Dutch institutions of higher education the subject of e-portfolio continues to attract increasing interest. This can be explained partly by the focus on competence-oriented education in universities of professional education, in which the emphasis is placed on student development, but also by academic universities' attention to fostering academic maturity. In the process of educational innovation, the e-portfolio is frequently used as an aid for guiding the learning process or as an assessment tool. It also offers the 'Net Generation' students [1, 2] of today the possibility of presenting themselves to various target groups. E-portfolios have the potential to offer clarity and flexibility, which various stakeholders in education have a particular need for, both in pedagogic and administrative processes.

Much useful experience with the implementation of e-portfolios has been acquired in the Netherlands, through both national projects and initiatives set up by most institutions of higher education. The aim of NL-Portfolio [3], established in 2004, is to combine, share and expand this experience. NL-Portfolio is one of the SURF Foundation's special interest groups. SURF [4] is the Dutch partnership organisation for Information and Communications Technology (ICT) in Dutch higher education and research.

In this paper we give an overview of what we have achieved in the Netherlands in the field of e-portfolio and we present a framework for describing and planning e-portfolio implementation. As examples we present the e-portfolio projects of the Universiteit van Amsterdam and Windesheim University for Professional Education. We also show how co-operation across institutions of higher education is developing (both national and international) with partners in the educational sector.

2. Overview of nationwide projects

Over the past four years some major initiatives have been undertaken on a national scale in the Netherlands. We will describe the three most important ones below.

2.1 SURF E-folio (2001-2003)

Three Dutch universities (University of Maastricht, Utrecht University and the Utrecht University of Professional Education) launched the E-folio project [5] (supported by SURF) in 2001 aimed at identifying and publicising pointers for the successful use of e-portfolios in higher education. The lessons learned are listed below [6]

- Portfolios should be tailored to the purposes for which they are used in the learning environment. Introducing portfolios is not a good idea in all curricula;
- Management should provide solid support for the educational change implied by the use of portfolios. The use of portfolios means learning in authentic situations, creating room for individual development, and investing in coaching and alternative assessment;
- Electronic portfolios must be supported by an adequate IT-infrastructure. No ripples are felt while functioning is smooth, but problems with IT could prove an excuse to postpone or avoid investing in working with portfolios;

- Teachers and students are responsible for the tasks involved. If they fail to appreciate the added value that working with portfolios provides, they will not invest the relatively large amount of time and energy required.

2.2 LMS/DPF (2002-2004)

The aim of the LMS/DPF (Learning Management System/Digital PortFolio) project [7] was to realise an environment for learning and teaching in which student centred and competence based learning becomes possible and which supports the transformation in which the students will direct more than before the learning and teaching processes. In the project two universities of professional education were involved, Fontys and Rotterdam University of Professional Education.

In order to take a greater responsibility for their learning, students must be supported by a powerful learning environment, in which competences, process steering and co-operation, are the pillars at which the concept of education is built and IT helps meeting their demands.

One of the major findings of the project is that the students are very well able to direct an important part of their learning, using the integrated combination of a learning management system and an e-portfolio, called N@TSchool [8]. In the educational shift towards student centred education the role of the teacher changes to coach and facilitator of learning processes.

LMS and DPF are tools specially devised to support flexible demand-based and competence-oriented training. They enable students to get all the information they need to plan their educational path and organise the process. These tools comprise a number of key components: a competence training matrix, a personal development plan, a personal activity plan, a 'pending' dossier, a final dossier and an assessment dossier.

Students of the Department of Education of Teachers in Nursing in Rotterdam, which worked under transformed educational conditions, mentioned the following valuable results of the new flexible, competency-based curriculum [9]:

- Meaningful learning and intrinsic learning;
- Using different strategies, such as learning from experiences and team learning;
- New goals (experimentation and innovation);
- The opportunity to choose your own strategy;
- Goal-directed learning;
- Self-responsible learning (the opportunity to pursue your own interests);
- Learning to regulate and test your own learning process.

2.3 Digital University Portfolio Implementation (2002-2004)

Seven Dutch universities, Utrecht University of Professional Education, Amsterdam University of Professional Education, Saxion University of Professional Education, INHolland University of Professional Education, Twente University, Universiteit van Amsterdam en de Free University Amsterdam have worked together on a toolkit, a website [10], with information and documents to be used at the start of portfolio implementation.

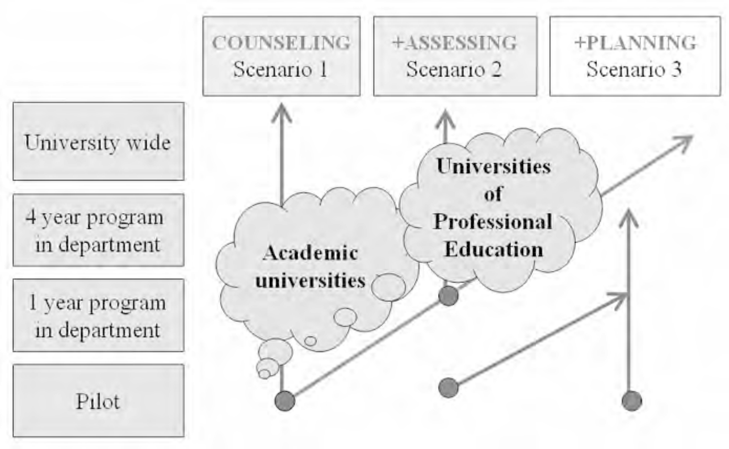

Figure 1. Scenarios for e-portfolio implementation

They have also developed new information for managers to help enable them to supervise the portfolio implementation process. Scenarios have been described for portfolio use to present the options in study programmes and set the borders dividing them (Figure 1). Checklists have been drawn up to provide insight into the right conditions for successful implementation.

The impact of the change process is quite different in each of the scenarios. The differences emerge because there is a different impact on how the educational activities are organized. In scenario 1 for example, not all the teachers are involved in the changes, though this is the case in scenario 2, and in scenarios 1 and 2, there is a programme of educational activities that the students take part in, whereas in scenario 3 the planning of the students themselves steers the educational activities.

In each of the scenario's the implementation process does not focus so much on tools as is often the case in e-portfolio projects. The model, along with the large database of experiences and material on the website, helps the institute to choose its ambitions and lines of development from a functional perspective. In this sense working on e-portfolio implementation becomes a form of change management in which the university can work out its specific form of 'Folio Thinking' [11].

3. Two cases of portfolio implementation

We will describe two cases of portfolio implementation in progress at our universities.

3.1 Example of Scenario 1: academic training and skills at the Universiteit van Amsterdam

The Universiteit van Amsterdam is an academic university with 'traditional' education: lectures, work groups and laboratory courses. The departments are reasonably autonomous and formulate their educational concept themselves.

Ever since 2001, there have been numerous pilots focused on working with an electronic portfolio [12]. In the space of three years, the plans have been put into effect at nine of the twenty-four university departments. Progress was so rapid all over that in January 2003, the decision was made at the central level to draw up a university-wide implementation plan. The situation was described for a two-year out roll in an effort to have 40% of the 22,000 students working with an electronic portfolio by 2005. Due to the great financial investments this would involve, the decision was made to first discuss the matter with all the educational directors to enrol their commitment to the project. After their commitment was clear, a new Plan of Approach was written to prepare a Go – No Go decision for September 2004, so the University Board could make a decision.

The increasing focus on academic training and skills is the reason to start with a portfolio at this university without a central concept of competence-based education. Stimulating the growth of these skills and making them visible in an e-portfolio are the basis for all the pilots. Simultaneously with this movement, there is also renewed interest in arriving at a collective concept of education. As a result of the collaboration with a professional university (Amsterdam University of Professional Education), the improvement of the study career counseling is once again on the agenda.

These three movements converge in the UvA portfolio implementation route. Scenario 1 (instrument for counseling and personal development) is expected to serve as the guideline in the next few years.

In view of the strongly autonomous role of the departments at the UvA, up to now the change approach (according to the classification by De Caluwé [13]) has been characterized as a "yellow change" with attention for creating a support base/sharing views/involving the context. The implementation of an electronic portfolio will however require a "blue" approach with a blueprint for a study career-counseling route with checklists for the managers to steer the pilots and new initiatives. This is an approach that is common practice in the IT world but not so much at this university. There will also have to be a "red" focus on stimulating and encouraging teachers to grow in their changing role from expert to coach via a professionalization route.

3.2 Example of Scenario 3: organizational transformation at Windesheim University

The past three years Windesheim University of Professional Education has worked on an integrated and functional strategy for the development and implementation of a campus wide e-portfolio system [14]. In the developed pedagogical model using an e- portfolio is not to be just some extra activity that stands apart for the teachers and the students. Instead it should be a fundamental cornerstone for the pedagocial process on the one hand and the educational institute's administrative processes on the other. When implemented in the heart of both, an e-portfolio should make learning and teaching more efficient and effective. It should support and improve students' acquisition of competencies and it should also bring about and support a more transparent and flexible workflow for the different stakeholders involved. In this picture E-portfolio fulfils vital demands for overview and flexibility, which helps answering questions, like "Where do I stand?" and "Where do I move next?" that become even more important in student-centred education.

Windesheim plans to use e-portfolio as a tool for both students and faculty in all of the courses. The results of the first pilots have shown that it can make learning and teaching more efficient and effective, when embedded in the workflow of students and faculty. An important element of e-portfolio development and implementation at Windesheim so far has been that the different stakeholders have been involved from the start of the program in 2001. By working this way there is common ground regarding the functional specifications, the key processes and the selected tool.

Windesheim is currently piloting in 5 of the total number of 10 departments and already scaling up in two other departments. It is preparing the three remaining departments in terms of educational and administrative processes. Parallel educational standards for the application of e-portfolio in student centred competence based education within the major-minor model are being developed. At Windesheim e-portfolios will eventually cover all primary functions mentioned in scenario 3 above (counselling, assessing and planning) in both Windesheim's more classic courses and especially in so called integrated professional tasks that students work on over a longer period of time. Figure 2 shows the central position e-portfolio will have in students' processes.

3.3 Challenges in implementation

As there are of course differences between the cases described of the University of Amsterdam and Windesheim described above, there are some mutual challenges to face in each scenario. Some of the key issues appear to be:

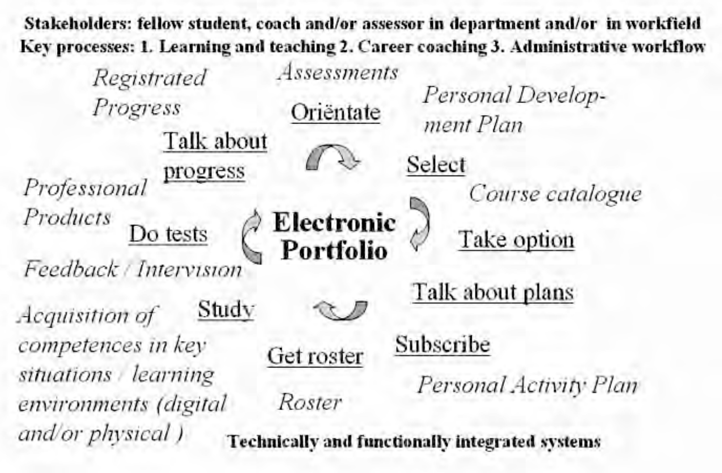

Figure 2. E-portfolio process model

- On the organizational side, the question is how to keep the different perspectives of involved stakeholders in line with each other? It is clear that a multi-disciplinary approach in development and implementation is essential with the involvement of all of the stakeholders (students, teachers, coaches, assessors, work field).
- Sharing of outcomes with each other is also an important element. E-portfolio implementation is not an easy job to do. Learning from each other, and making new choices together helps to keep the stakeholders involved.
- Support by management is crucial, the lines of development are best to be chosen as a result of a bottom up process, but after the decisions are made management should support and facilitate them top down by defining a strategic framework.

- Another important form of support is that on the functional-pedagogical and on the technical-instrumental side in the different departments and in co-operation with institution wide support units for IT and Educational development.
- Although one should not focus on the technical issues too much, there is of course also the technical challenge: how to create functional workflows in an integrated technical infrastructure? In the Netherlands there is a growing tendency to work with integrated architecture approaches, giving attention to open standards and interoperability. In most cases e-portfolio is not just a single tool (one piece of software), it is more often part of a larger technical configuration, in which the required functionality may be met by the interoperation of different hard- and software tools.

4. Policies for co-operation within the educational sector

E-portfolios play a significant role in both the pedagogical and administrative processes of institutions not only in higher education but, increasingly, in other branches of the Dutch educational sector as well. Furthermore, even outside the confines of education, issues such as 'competence management', 'employability' and 'life-long learning' are salient topics of discussion, both in the field of employment and the public arena. Therefore different partners in the educational sector in the Netherlands establish links and develop initiatives beyond educational boundaries.

Within Dutch higher Education SURF funds special interest groups, a concept that has already been applied successfully for the subjects of streaming audio and video in the 'Webstroom' [15] group and for standardization in the 'SIX' special interest group [16]. As yet another of these special interest groups 'NL Portfolio' has defined its activities for the coming two years, including:

- Setting up a co-ordinating website that will be the portal to the subject of e-portfolio for Dutch institutions of higher education;
- Participating in existing innovation projects in the Netherlands [17], grassroots projects, and e-learning research projects;
- Initiating its own project tender among Dutch institutions of higher education;
- Co-operating internationally in the field of e-portfolio;
- Exploring and developing the subject of 'life-long learning' in the Netherlands, thereby co-operating with partners in the educational sector, the government and the professional field;
- Dissemination by means of national and international conferences and study days.

Co-operation within higher education in the Netherlands has been taken up for example in the 'Trendstudy E-portfolio in higher Education' [18], as part of an e-learning research project by SURF, aiming specifically at the audience of higher education managers, describing the lessons learned by different institutions regarding e-portfolio, in terms of 'actors, factors and strategies'. Also different higher education consortia in the Netherlands, like Apollo [19], E-merge [20] and the Digital University [21] have done e-portfolio tool studies to explore the future in this field together.

Across the educational sector different partners, from primary education up to higher and further education have worked together on a broad state-of-the-art study on e-portfolio in the Netherlands. The report [22] describes five possible routes for future development in terms of co-operation: from doing nothing (route 1), up to one system for e-portfolio on a national scale (route 5). The report advises to work towards 'route 4' by creating 'one mutual highway' that will set standards for both functional and technical specifications that can be applied regionally and in different sectors of education. Also in other sectors of education initiatives on portfolio exist. An example is "Platform portfolio" in the professional education sector [23].

Internationally co-operation on e-portfolio is also emerging. Some recent achievements are:

- The annual conference organized [24] by EIfEL in La Rochelle in France attracted 180 specialists from across the globe, using as a credo "*Objective 2010 – Eportfolio for all citizens"* [25].
- Recently IMS has launched its specifications for e-portfolio's [26]
- At Educause 2004 there were some ten presentations and working groups on e-portfolio [27], and also a preconference by different participants in OSPI [28], the Open Source Portfolio Initiative.

A recent example of co-operation by Dutch universities was organized by SURF and ALT [29] (United Kingdom). Portfolio specialist from both countries have exchanged knowledge and experience in a working seminar and written a briefing paper together [30]. The paper highlights apparent similarities and differences in approaches between UK and Netherlands as well as opportunities for future collaboration. In the 2005 edition [31] ILTA [32] from Ireland joins the conference and research seminar.

The University of Maastricht participates in the European Union funded EPICC project [33], which describes use cases and scenarios.

Conclusion

Together the models, cases and examples described above make it clear that 'folio thinking' is and will remain a strong trend for the coming years in the Netherlands. It is at the same time a result of and a stimulus for both the development and implementation of e-learning and that of pedagogical change across educational sectors and potentially also through working life of our citizens.

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VOCATIONAL COMPETENCE - A SOLUTION TO MASS APPRAISAL

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United Kingdom

The Role of ICT in Facilitating Large Scale Assessment of Vocational Competence

This paper is the result of collaboration between National Energy Services (NES), a company that provides a wide range of services to the energy industry in the UK and The College of Estate Management a higher education provider of distance learning courses. The paper examines the use of ICT as a key component in facilitating large scale vocational competence assessment. An exercise that mirrors the objectives and purpose initiated in 2000 by the Lisbon Process and furthered in 2002 at the Barcelona summit and formalised in the 2002 Copenhagen Declaration on Vocational Education & Training and its convergence with Lifelong Learning.

Background

In November 2004 the British Government approved a new Housing Act. The Act radically changes the way all residential properties are bought and sold in England and Wales. The Act introduces a requirement for all residential properties that are placed on the market for sale to have a 'Home Condition Report' produced that details the condition of the property. The report contains an Energy Rating for each residential dwelling as required under EU Directive 2002/91/EC and is a key component in the UK's attempts to fulfil its Kyoto commitments. The scheme will become operational in 2007.

The UK Government have predetermined that only Licensed Home Inspectors will be able to carry out the Home Inspections and produce the Home Condition Reports.

To obtain a licence to practice as a Home Inspector the Government have stipulated that individuals must demonstrate their vocational competence against a set of National Occupational Standards (NOS). The NOS state the 'Knowledge and Understanding' and the 'Competences and Scope' the Home Inspector must demonstrate before being awarded the qualification of a Diploma in Home Inspection which is a Vocational Related Qualification (VRQ).

It is estimated that approximately 7000 Licensed Home Inspectors will be required to service the English and Welsh Market; therefore 7000 candidates must be assessed for Vocational Competence in a two-year period.

The Vocational Related Qualification Process – Traditionally a Very Labour Intensive Activity

VRQ Qualifications Structure

Diagram 1 below demonstrates how a VRQ qualification is structured. The competence of candidates is assessed through Approved Assessment Centres. The assessment is the process of measuring a candidate's evidence against the VRQ standards. A brief overview of how this has traditionally been undertaken is as follows:

Stage One – Assessment Planning – the assessor and candidate meet regularly to agree and review plans for assessment.

Stage Two – Assessment – this is an ongoing and as agreed in the assessment plan. It will include a range of assessment activities where assessor will gather and assess evidence generated by the candidate. This will include observation, questioning, and examining evidence of different types.

Stage Three – Judgement and Feedback – after any assessment the assessor should always give feedback and tell the candidate what they have achieved so far.

Portfolio Development – ongoing – During assessment evidence generated by the assessor and candidate (except confidential evidence) is compiled into a folder or portfolio.

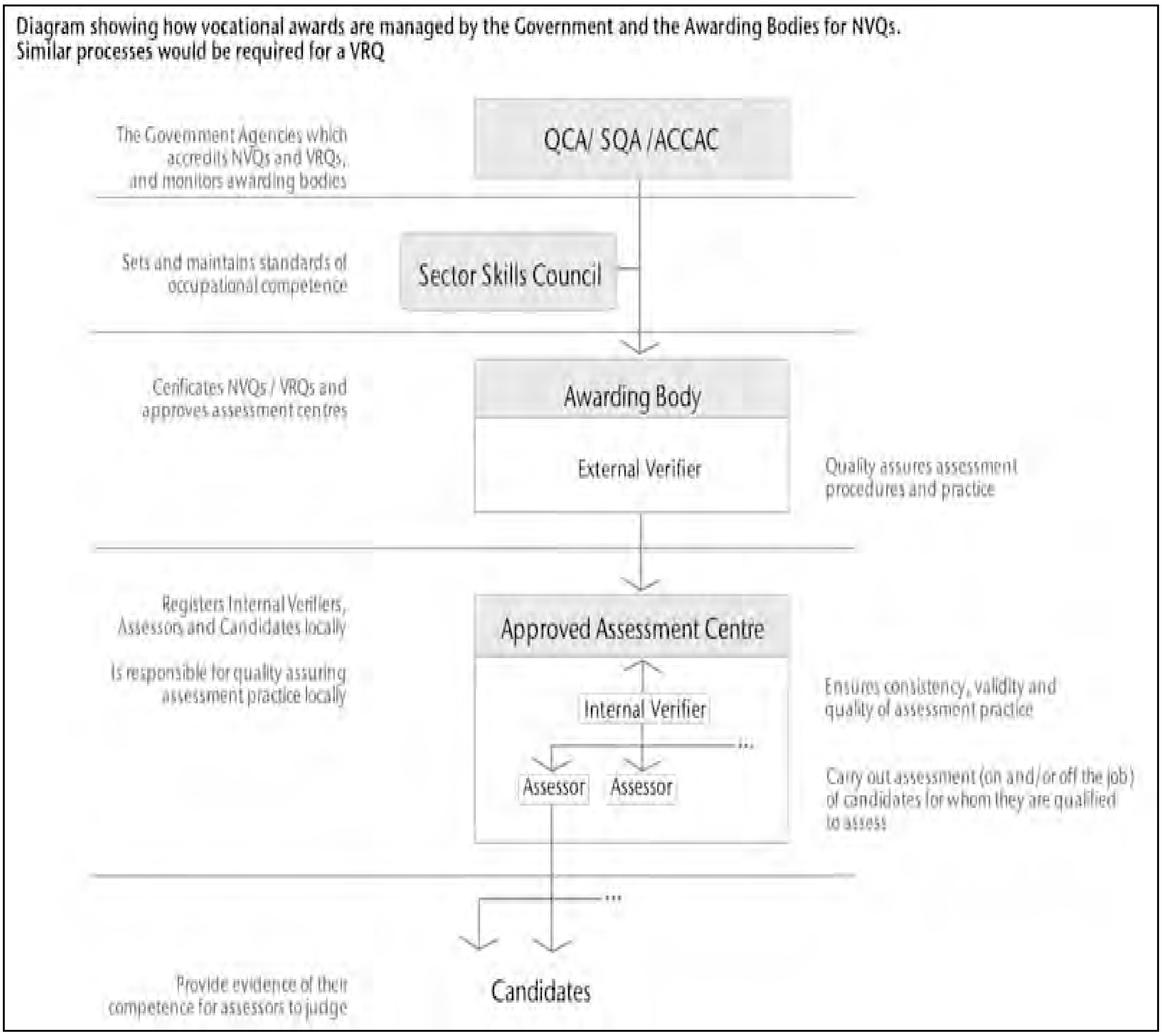
Stage Four – Internal Verification – all assessors are required to participate in a variety of internal quality assurance processes including attending regular meetings and presenting their candidates' evidence to the Internal Verifier.

Role of the Assessor

The role of the VRQ assessor is critical to the success of the assessment process and the ultimate achievement of awards by candidates. The skills and attributes required of the Assessor are complex. To operate as an assessor a person must be both occupationally competent in the area they will be assessing and have achieved an assessor award. Therefore the number of people with suitable skills to become assessors is limited.

This overview of the traditional VRQ assessment process demonstrates that the assessment process is very labour intensive and includes one to one contact with each candidate.

The Vocational Awards 'World'



The Challenge

A critical element of the Governments legislation is to have sufficient Licensed Home Inspectors in place by 2007. If this is not achieved the whole system of Home Condition Reports will be brought into disrepute creating in-efficiencies in the market for residential properties in England and Wales that do not exist currently. This is precisely the reverse affect intended by the legislation.

To achieve the target the Approved Assessment Centres will have to train to satisfactory levels of vocational competence and assess some Seven Thousand (7,000) candidates. A critical element in achieving the target is the small number of suitable Assessors to meet the demand for vocational assessment.

One Response

The Response of one of the Approved Assessment Centres, SAVA (who are part of National Energy Services, based in Milton Keynes, UK) was to explore how ITC could be employed to improve the efficiency of the assessment process and vocational training. The objectives were to:

- maximise the time their Assessors spend on the Assessment of Candidate Evidence;
- minimise the time spent by Assessors on visiting and guiding Candidates;
- remove geographical restrictions on Assessors and Candidates;
- comply with the recognised quality assurance framework;
- allow candidates to self test their 'Knowledge and Understanding' and their vocational 'Competence' against the NOS;
- fill the competence gaps of candidates by e-learning.

SAVA estimates that they will train and assess approximately 2000 candidates for the Home Inspector Diploma before 2007. The two Authors were directly involved in developing the process and systems to achieve the goals and the remainder of the paper explores the ITC systems that have been developed.

On-line assessment

SAVA has designed its Assessment Centre to reflect the fact that the vast majority of potential Home Inspectors are experienced and busy professionals, already working in a closely related field. The Assessment Centre is based on-line – from initial registration through to the assessment. This allows candidates to submit evidence of their 'Knowledge and Understanding' and vocational 'Competences and Scope' at their own pace, building their portfolio whenever it is convenient for them to do so. It also allows Assessors to access their candidates' portfolio from wherever they are located at any particular point in time.

e-Learning

As candidates identify gaps in their knowledge and understanding they are referred to The College of Estate Management, a Distance Learning College dedicated to the Built Environment, who provide learning resources both in a traditional text manor and interactive e-learning programme to fill the gaps identified. This may be individually tailored information, general sector information or complete courses.

Access to Home Condition Report software

Candidates have free access to software for compiling complete Home Condition Reports, including the energy report element. As part of the assessment process, candidates for the Diploma will have to produce 10 residential property reports, of which at least three must be in the new HCR format. The software enables candidates to upload and store both associated site notes and photographs, essential elements to the assessment of vocational competence.

Self-test facility

The SAVA Assessment Centre incorporates a self-test facility, designed to help candidates evaluate their own level of knowledge in each of the areas of competence covered by the VRQ Home Inspector Diploma. The self-tests are not compulsory and do not form part of the assessment process, but they will help you to identify areas where knowledge and understanding need to be improved to pass the End Test.

e-Portfolio

Candidates are able to manage their portfolio – the body of evidence that demonstrates their knowledge and competence – using SAVA's online system. Evidence is simply uploaded via a candidate's PC (either at home or in the office) and is securely stored by SAVA. The assessor gets access to the information instantaneously, and any feedback from the assessor is easily relayed back to the candidate. Because the Assessment Centre is online, it is always open, meaning that both the candidate and assessor can work on the portfolio at any time.

The End Test

The End Test is just that – the last hurdle before the Diploma in Home Inspection can be awarded. Once a candidate's portfolio is complete it is time to sit the 90 minute End Test set by the awarding body. This includes a mixture of multiple choice questions and case studies based on properties ranging from Victorian semis to modern homes. The test is sat on-line.

The flow diagram in the Appendix identifies the place and procedure for each of the elements above and how it relates and complies with the assurance framework.

Analysis

Methodology

The Authors were part of a team that undertook a pilot project to test the viability and robustness of the system for both Assessors and Candidates. Quantitative feedback data from both the assessors and the candidates in the pilot is analysed below. The conclusions also draw on Qualitative assessments made by the authors.

Analysis of Feedback Data

Assessor Feedback

Assessor feedback was obtained from all the first batch of Assessors to use the on-line assessment and e-portfolio. It is recognised that this represents a small sample but a one hundred percent collection rate demonstrates some consistent trends. The intention is the continue to analyse feedback from Assessors as new Assessors graduate to use of the on-line assessment and e-portfolio systems.

Analysis of the feedback demonstrates that:

- The on line assessment and e-portfolio were not a critical factor in their decision to become assessors. If fact over 80% of the Assessors said that they would still be willing to become Assessors if the system was not on-line.
- However 80% of the Assessors confirmed that they think the on-line assessment system and e-portfolio will enable them to increase by up to 25% the number of assessments they will be able to undertake.
- 44% of the assessors found the on-line assessment and e-portfolio very easy to navigate. 33% found it easy to navigate, 11% found it difficult to navigate and 11% very difficult to navigate.
- Very interestingly 100% of the Assessors printed hard copies of the e-portfolio to undertake the marking process.

Candidate Feedback

Candidate Feedback was obtained from Candidates registering with the SAVA Assessment Centre and receiving an induction pack explaining the on-line systems. The sample was larger than for the Assessor Feedback but the return rate reduced to approximately 30%. Analysis of the feedback demonstrated that:

- 80% of Candidates found the Assessment Process straightforward, 10% were not sure and 10% found the Assessment Process difficult to understand.
- 100% of candidates were clear on how the on-line system operates.

Conclusion

From the feedback it can be concluded that the system is meeting the goals set in 'One response' above in relation to the increased productivity of assessors with assessors estimating that they will be able to increase productivity by up to 25% because of the ICT systems. Critically, candidates also understand the on-line assessment system following induction. However the fact that hard copies of e-portfolios are used by all assessors for marking purposes would indicate that the on-line assessment and e-portfolio assist in 'transportation' of materials rather than reduction of paper.

SAVA and the Authors are confident that the efficiency gains that the on-line assessment centre will deliver over and above the traditional Assessment Centres will enable SAVA to complete the assessment of vocational competence in line with projected demand from within their identified pool of assessor who are both occupationally competent in the area they will be assessing and have achieved an assessor award.

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Appendix 1

SAVA VRQ Assessment Process

Candidate registers with
SAVA Assessment Centre

Experience Scan
taken by all candidates.
Candidate is recommended for one of two routes.

Candidate is accepted into Assessment Centre and proceeds with qualification

Candidate is referred to an education provider, e.g. university, FE college to gain underpinning knowledge, returning to Assessment Centre later.

Candidate works through National Occupational Standards (NOS) and identifies performance evidence.

Self Test
undertaken. Identifies areas for personal development/training against NOS.

Candidate undertakes training to fulfil knowledge requirements.

Candidate begins to assemble evidence of workplace performance for E-Portfolio**.**
• Guidance given on further development (using Self Test).
• Further development (may include CPD) takes place.
• Recommended training event on Home Condition Report attended.
• Recommended training event on SAP (Energy Report) attended.
• Candidate assembles 10 survey reports (including 3 Home Condition Reports).
• Candidate uploads evidence and sends to assessor.

Assessment undertaken
candidate is deemed competent or assessor requires more evidence. Process continues until portfolio is complete.

Internal Verification

ABBE External Verification

Candidate passes **ABBE End Test**

HI Diploma awarded

E-PORTFOLIO – A BENEFICIAL TOOL TO DEVELOP DIGITAL CULTURE TO ACTIVIZE AND INVOLVE CITIZENS IN DIGITAL LEARNING ACTIVITIES

Torhild Slaatto, Norwegian Association for Distance Education, Norway

> A great part of the population (in Norden) have already employed many technological opportunities, but our challenge is to make all citizens active, so that the comprehensive new technological opportunities could be well utilized. That is only possible if the citizens have confidence in and knowledge of the technological opportunities, and if the authorities ensure the citizens' rights in the knowledge society.
>
> *(Quoted from the document on education written by the Danish chairmanship 2005, Nordic Council of Ministers (translated).)*

In this connection it is tempting to say: not only "confidence in" and "knowledge of the technological opportunities", but also *experiences* in using it. When I start using it, I will know the value of it, and I will know what it means to me, and I will get a chance to take part in some digital culture.

Digital competence

I guess the committee of this conference has a good definition of "digital culture". I refer to a definition of "digital competence" from a Norwegian official document *(Programme for digital competence 2004-2008,* Norwegian Ministry of Education and Research): "digital competence is the competence that builds a bridge between basic skills and the skills of using digital tools and medias in a creative and crucial way".

Simply we could assume that in a digital culture we need to have digital competence. In the knowledge society it is supposed to be a lot of ICT and opportunities of technology, and the digital culture is developing quickly, and may be also the digital gap, if no remedial actions are taken.

To take part in this digital culture and to feel well and adapted to it, it seems necessary to become a user of technology. A percentage of 60, 70 or 80 use computer and the Internet in many European countries, especially in Finland the percentage is high. But there is still a remarkable difference between teenagers and persons of 60 years old and above.

Some figures from Norway Gallup TNS, 2004, illustrates this fact: 95% of the teenagers are familiar with the use of computers and Internet, compared to only 43% of those of 60 years and above. May be the digital culture develop by "itself" for those who are young, but for us who have passed the age of 50 it might be more complicated. We did not know anything about computers when we grew up.

Anyhow, it is never too late to learn. Some interesting tools of learning, self-realization and self-reflection could be of great help. The tool combinates such attractive things as:

- self-reflection – and thereby learning;
- evaluation – and thereby learning;
- digital environment – or you could say "digital culture".

The tool itself is digital and multimedial. I talk about *e-portfolio*.

What is e-portfolio

e-Portfolio = electronic portfolio, digital briefcase – with an interesting content

The use of e-portfolio is increasing fast, in colleges, universities and different types of schools. According to Martin Arnaud, Paris University the use of portfolio has been fueled by the growing availability of commercial and open source database-driven web applications for e-portfolio. We can also see the first examples of using e-portfolio as tools for learning in workplace, in lifelong learning and personal development planning. But it has not been tested and developed very much yet as a tool in workplace and lifelong learning. I will give a couple of examples how it could be used later on.

EifEL – European Institute for E-Learning – compares the use of e-portfolio with the use of e-mail. Some years ago it was a discussion whether employees should be allowed to have their own mail address. We know how quickly the e-mail has been spread. Within 2010 most employees will also have their own e-portfolios, according to EifEL.

- ***A documentation of qualifications and competences***

  E-portfolio is defined in different ways. It is said quite simply that e-portfolio is a personal digital record containing information such as personal profile and collection of achievements. EifEL says that: "An e-portfolio is a personal digital collection of information describing and illustrating a person's learning, career, experience and achievements. E-portfolios are privately owned and the owner has complete control over who has access to what and when." EifEL states: "Technology has rejuvenated the concept of personal portfolios, which are now increasingly being seen as a powerful tool for personal development. The interest of a digital or electronic portfolio resides in its multiple dimensions: it is at the same time a tool for learning and a tool for assessment. In the context of a knowledge society, where being information literate is critical, the portfolio can provide an opportunity to demonstrate one's ability to collect, organise, interpret and reflect on documents and sources of information. It is also a tool for continuing professional development, encouraging individuals to take responsibility for and demonstrate the results of their own learning. Furthermore, a portfolio can serve as a tool for knowledge management, and it is used as such by some institutions."

- ***A learner-centric technology***

  But e-portfolio is not only a technical device, it is also individual learning and organizational learning. It is a learner-centric technology, EifEL points out.

- ***"My digital clone"***

  It has also been explained in this way: "In a digital world people need to present themselves digitally. E-portfolio is my digital clone, my e-self."

- ***A tool of learning***

  What is very interesting in our setting here in this conference is that e-portfolio opens up for learning, stimulated in a pure multi-medial or digital context. "E-portfolio is documentation of learning in a *process* of learning. And in this process I also realize that I need to learn something more." (Expressed in a panel debate in e-portfolio conference in London, 2004.)

  Stuart Cable at London College says: "I see e-portfolio as a whole different approach to learning."

What are the benefits of e-portfolio?

Michel Arnaud, University Paris, summarizes the benefits of e-portfolio as follows:

- A learning tool for the user;
- A monitoring tool for institutions;
- A mechanism for employment opportunities.

E-portfolio is normally having three dimensions:

- Documentation
- Presentation
- A tool for assessment and reflection

According to Peter Rees Jones, University of Leeds, *developing an e-portfolio is to support transitions between episodes of learning.* These transitions make a *whole*, connecting one's experiences, abilities, knowledge, know-how, skills, qualifications and competences, and the e-portfolio is the performance of it.

E-PORTFOLIO	**For learning Self-reflection**	**For learning Evaluation**	**For self-realization (goals, plans)**	**For presentation – myself – certificates – achievements – documentations**
At school, university, course venue	Reflect on assignments and results	Evaluation – by teacher – by co-students	Individual plan, studies/subjects	Certificates School reports Achievements Presentations Performances
At work place	Reflect on process and results	Evaluation – by senior – executive	Career plan	Documentation – achievements – evaluation – reports
In organized or volunteer activities	"How did I do my part, what did I learn?"	How did others like my work? Results?	Special competences to be tested and developed	For instance: A poster of a soccer cup, and a report/evaluation
In "small" daily activities (shopping, reading, sports etc.)	Some reflection of matters to take care of and to learn		For searching new opportunities	

Figure 1. The e-portfolio matrix: How can e-portfolio be built up and what is the use of it

Two cases demonstrate the e-portfolio possibilities of learning in digital enviromnent in working place and in leisure time.

Research and development

E-portfolio is rather new, and several development projects are established. An international research project on the impact of electronic portfolios on learning, engagement and motivation in schools is just about to start. The project director is Helen Barrett, University of Alaska Anchorage, an internationally recognized expert in e-portfolio. The study, which is unprecedented in scope, will examine how e-portfolios foster the engagement and reflection in the learning process, according to Barrett. This is a study of young people in school, but the results will probably tell something about adults' learning and lifelong learning as well.

Two cases and two approaches to practical use of e-portfolio

Case 1

Women, "Anne" (35)
Accountant in a big company
ICT knowledge limited to accountancy software
Hobby: Travelling (travel guide)

Six months ago “Anne” was asked to take the responsibilities of implementing the company’s new CRM (Customer Relation Management) system in the accounting department. She had to follow up the implementation, the training of all accountants and the daily use of the new system after implementation. She had an extraordinary hard job, because many of the accountants were against this new system. They preferred their old way of doing the things. In addition, there were several implementing problems and the shedule of the technical implementation were exceeded. But “Anne” showed up to be very talented in convincing and motivating her colleagues.

“Anne” has got an e-portfolio account on her computer, and has filled in her personal and contact information. She has also included some of her character references and her accountant diploma. Now she is asked to evaluate her own effort in the CRM project, and her executive has also given an evaluation report of her work. “Anne” makes a short summary of her evaluation which she puts in her e-portfolio along with the report from her executive (where she is praised).

In her own report she put down the facts of the project and her responsibility. Then she writes: “In my opinion I completed the work successfully according to the given instructions. See the report from my executive. I learned a lot about the CRM system, about useful softwares like Excel and Outlook Express, which I have started to use now. From now on I keep in regular contact with our customers by e-mail (before I had irregular contact on phone, and it was time consuming). The motivation of the accountants to accept the new system and their training program was the hardest part of the project. I realized that I had the necessary endurance and motivation power to reach our goal to make all accountants mastering the new system. On the other hand, I also realized that I did not know anything about internal project work, and therefore I made some unnecessary mistakes. I would very much like to attend the project management course to prepare myself for doing an even better job in our next project.”

“Anne” also opens the folder called “Career and goals” in her e-portfolio, and she writes:

“I want to apply for the project management course because I need to learn more about working in internal projects.”

“Anne” spent 15 minutes to store her experiences and new competence in her e-portfolio. In her next job application, she will of course include this particular experience.

Case 2

Man, “Jimmy” (58)
Handyman, security company
ICT experience – next to nothing
Hobbies: Photographing and golf

“Jimmy” has a long career. He has worked for eight different companies. He looks forward to his retirement and enjoys the thought of having plenty of time for his hobbies. One day he gets an offer of joining the famous Internet Photography Competition. One of the chosen competition categories is exactly what “Jimmy” has specialized in: golfers in action. He has 150 brilliant photos of golfers. But there is a serious hinderance: He has to digitalize the photos and enrolment etc. has to be done on Internet. This is a real headache – “Jimmy” feels that he must take part in the competition. But he feels hesitation to ask somebody for help. After some considerations he contacts the distance learning institution where he made a correspondence course in photographing some years ago, and asks if they can help him to learn how to use Internet and how to digitalize photos. After a couple of days “Jimmy” starts his courses, and he spends all his spare time in front of the old computer which he has got from his employer. After a lot of struggle he can manage to understand how to use the common software, and he also gets the right software and equipment to digitalize his photos. He is very happy to choose five of his best photos of golfers in action for the competition, and he is very proud of himself to be able to enrol himself and transfer the chosen photos to the jury. He has also realized that he has to make his own e-portfolio to present his best shots, so that he is able to join new competitions and may be sell some of his pictures in the photo pools on Internet.

He gets hold on a particular e-portfolio for photographers and starts to put his personal information, information of cameras etc. When he reaches to the headline “Short-term goals” he puts: 1. E-learning course in digital photographing, 2. Purchasing a digital camera.

Daily learning – lifelong learning

By these two cases, “Anne” and “Jimmy”, I have tried to illustrate how tasks on job or episodes in our daily life make fantastic chances of learning – and lifelong learning. By means of some digital tools, such as e-portfolio, we are stimulated to learn more and to make some very important reflections on what we learned, what we are good at and what we need to learn more about. Sometimes it is upside down – our hobby stimulates us to jump into the digital world. “Jimmy” made his first steps into the digital world and the digital culture due to his passionated interest in photographing and golf. It pushed him into some courses, and that made him realize that he wants to learn even more to get further.

“Anne” made a jump in her career when she succeeded to implement the new system in her department. By spending a few minutes to reflect on her work, and to write it down in her e-portfolio, she systematized her achievements, and made it clear what she wants to do next to move further in her career.

Of course, e-portfolio is not a matter of necessity, either on job or at home. But is is a very useful tool, especially it is a tool to take part in the digital culture that seems to be developing day by day.

Some schools, universities and a lot of persons have made their experiences with e-portfolio. In Wales the authorities offer all citizens a lifelong e-portfolio, and they make their e-portfolio-start in the first day of their school life.

Still there is a long way to go. In the Nordic countries we have not been very active, but some schools and university colleges now arrange for the facilities of e-portfolio integrated with the study programmes, for instance at Hedmark university college. They use a particular software, Aspiro, developed by a small firm connected to the college. Several projects to develop the use of e-portfolio is going on, or going to be started, for instance a nordic lifelong learning group has applied for project funding from the Nordic Council of Ministers. The headline of the project is “How to increase the daily learning by means of e-portfolio – in working place, in schools, in organized activities and in everyday life?”

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E-COMPETENCE AT HIGHER EDUCATION INSTITUTIONS E-SKILLS AND THE LEARNING ORGANISATION

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Introduction

The European Commission has declared e-learning as a key element in the long term strategy of the eEurope Initiative, aiming "… to ensure that the European Union fully benefits from the opportunities offered by the Information Society Technologies" (DG EAC 2003). Within the eLearning Action Plan, the DG EAC has identified the importance of "… training of European teachers and trainers" as well as the "… facilitation of cooperation and networking between actors" (DG EAC 2001).

Whilst eCompetence has been referred to as a subtopic in a number of projects funded under the eLearning Action Plan, there has been, thus far, no substantial in-depth analysis or development of the theme on a European level for Higher Education. The European eCompetence Initiative (www.ecompetence.info) tries to respond to the challenges mentioned above and to develop a substantial in-depth analysis of the theme for Higher Education.

The eCompetence network

The European eCompetence Initiative is a highly specialised, large network, which is looking at individual and organisational strategies for the development of eCompetences in Higher Education. 23 partner institutions from European member countries, Switzerland, Turkey and South Africa contribute to this project. The people involved serve different functions at their institutions. They work as teachers, researchers or developers, managers, technology experts or staff developers. This heterogeneous composition reflects our assumption that mere focus on personal competences could easily lead to a narrowed perspective on the single teacher and his or her activities in the classroom. To open this perspective we also wanted to take organisational and social aspects of eCompetence into consideration. A coordinating team defines the activities and steers the cooperation within the consortium.

The theory

Our approach of the use of educational technologies is based on theories of social construction (Fulk, 1993). These theories propose that interactions with social agents control the technologies and their effects and that attitudes toward and uses of technologies converge in social systems. Given this, we consider usages of educational technologies in courses, workshops, or other educational settings as 'technologies in form' (DeSanctis & Fulk, 1999). Technology and educational settings become more and more incorporated into each other, which also has consequences for the roles and social arrangements in educational processes. Examples are communities of practices, online courses, virtual projects, and collaboratories. In general, educational technologies are based in networks like the internet; therefore we refer here to these usages as networked education.

In Figure 1 we present the basic aspects of networked education. First, we distinct the participants in education. Second, we consider the educational technologies. Third, we look at the context, here the educational setting within that.

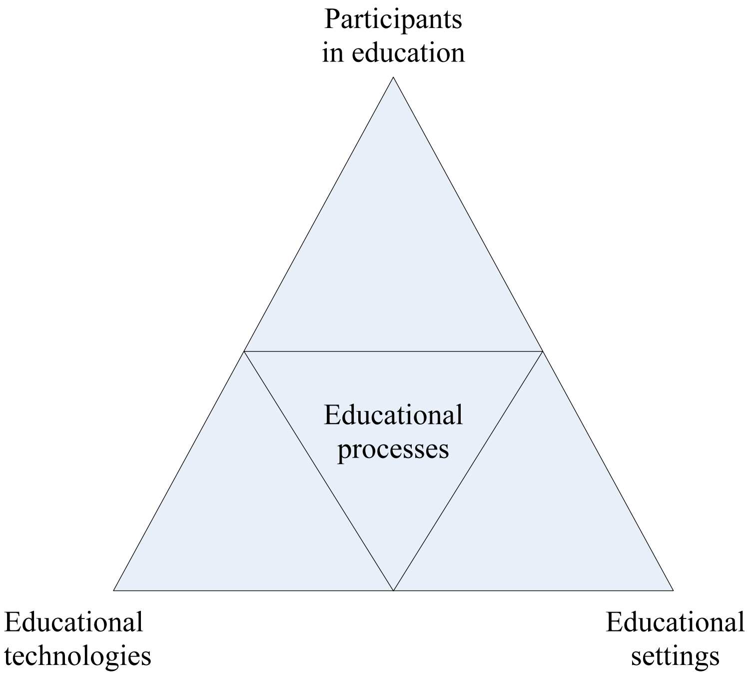

Figure 1. Networked education as technology in form

In this approach, eCompetences in education are also seen as a set of an interrelated and inseparable set of competences in the field of technology use, educational design, and education.

The method

We started with a survey to draw from the diverse practical experiences of our partners. For this survey we used a questionnaire to generate descriptions of effective practices or solutions for the support of eCompetence at higher education institutions. Different to theoretical models, plans or policy statements, we wanted to receive descriptions of actual patterns of activities which have been performed in reality.

This questionnaire was created after the example of the EDUCAUSE effective practice and solution database. We asked our partners to provide us with a compact description of a few paragraphs of a practice or solution they relate to the issue of eCompetence. The descriptions should have a title, a paragraph on the background or challenge that was to be tackled, a paragraph on the practice or solution itself, as well as short paragraphs on the benefits, shortcomings and future plans for this practice.

We received 26 responses, very different, heterogeneous examples of “effective practices”. In a first examination, we used the distinction between participants in education, educational technologies and educational settings to analyse the provided descriptions.

Participants in education

Providers of services

With respect to the providers of ICT-related services in higher education, we can distinguish between a supra-institutional, an institutional and an institutional sub-unit level, thus comprising organisations, groups and networks, as well as individuals.

- Regarding the supra-institutional level, we mainly refer to national higher education agencies, supra-institutional service units and institutional networks in the context of ICT-related higher education. What we did not observe so far, even if we know they exist, are supra-institutional units and networks that go beyond national contexts.

- At the institutional level, the provided examples mainly dealt with institutional strategies, centralised support units and services, and with the networking of faculty to build communities of practice for the use of ICT in higher education.
- The descriptions at the sub-unit level (departments, research groups or individual lecturers/researchers) deal with the use of ICT in study programmes, single courses or individual learning/teaching activities.

Diagonally to this more hierarchical distinction in supra-institutional, institutional and sub-unit levels, it is also necessary to distinguish between traditional actors (e.g. higher education institutions, national agencies, etc.) which can be regarded as members of the higher education system in a more narrow understanding, and non-traditional suppliers, like specialised service and ICT-training companies or, even more important, software vendors for educational technologies.

Even if not all of the given descriptions (especially at the supra-institutional and the institutional level) do not yet explicitly deal with the question of eCompetence, these distinctions make clear that educational processes take place in a broader social context than the mere teacher/student interaction in separated (either physical or virtual) classrooms. On the one hand, it is necessary to see that educators (as well as students) have to learn from each other to develop transferable models of practice, which go beyond the individual experience. On the other hand, it is necessary to observe that each of the mentioned actors has its own assumptions about educational processes, the necessary educational technologies, the related educational settings and its own role in these processes. From this perspective, competence can be the knowledge about relevant actors (and their competences) and the ability to interact with them. However, it is obvious that the increased use of new educational technologies does not only affect the teacher/student interaction, but also the social arrangement among the actors that provide services in the educational process.

Target groups for services

The most commonly mentioned groups for services were faculty and students. Only a very few of our examples dealt with services aimed at organisational units.

The focus on faculty seems to be an obvious choice, since the individual faculty member traditionally is regarded as the principal actor in higher education. Several examples dealt with the promotion of educational technologies, aiming at their broader use, sometimes even at a faculty-wide roll out. Some of these examples dealt with content production or the introduction to the basic functionality of special software products. An even larger number dealt with the training of trainers in pedagogical issues, e.g. online-moderation or other forms of interaction in courses.

We also received descriptions of educational provisions for students and how they are delivered with the help of ICT. In these cases, we still have to go into detail about the specific eCompetences of students that are either required or enhanced.

Fewer descriptions dealt with services aimed at organisational units, like institutions, departments or study commissions. Still we are very interested in these examples and will try to generate more of these descriptions, since they aim at the competence development of larger social entities.

Educational technologies

With respect to educational technologies, we distinguish between three types of activities: the development of new technologies, the integration of different sets of technologies and the dissemination of technologies. Surprisingly, these activities can be found on supra-institutional, institutional and sub-unit level as well.

Even if many of our cases take their technical environment as given or as not necessary for their descriptions, it is striking, how many others deal with the development of new educational technologies. This is a strong indicator that many options for development are still open to be realised and that actors in higher education feel the urge to contribute to the design of their technical environment. Higher education serves both as a developer and as a test-bed for educational technologies.

Rarely educational technologies are developed for the use of a single entity only or show their practical usefulness without the participation of many users. Developers as well as providers of educational technology services (e.g. central technology units) therefore often have to strive for the dissemination of their products. One can say that the (not necessarily commercial) market for educational technologies is still more driven by supply than by demand. Training trainers on the tool is one of the most prominent dissemination strategies.

To adapt to new educational technologies means either to perform existing practices in a new way or to develop entirely new practices, sometimes even both. In any case, it means possible conflicts with traditional practices, especially if benefits are not easily visible or achievable. Ironically, these kind of conflicts can be created by different sets of technologies as well, since they often offer competing models of practice. The integration of different technologies therefore was mentioned as an issue in some of our descriptions.

Educational settings

Most of our partner institutions provide residential education, even if some are also involved in distance education. In several cases it became clear that an intensified use of educational technologies can lead to the introduction of distance learning elements and the development of blended learning scenarios.

The majority of descriptions referred, either explicitly or implicitly, to the traditional setting of the single course, e.g. the context of a well defined group of learners and their respective teacher. Some described educational settings even below the level of the single course. Only a few of the given descriptions got beyond that narrow context of the single course and dealt with the use of educational technologies in entire study programmes. We regard this perspective especially important, since it enables us to observe educational settings and activities that can be placed diagonally to the regular structure of the course, e.g. larger communities of practice or individual student portfolios.

A few cases also addressed the issue of the teacher/student relationship. While several of these cases still can be regarded as teacher-centred educational settings, a few described attempts for more student-centred approaches.

Further research

Apart from a deeper analysis of the existing descriptions of effective practices, we want to broaden the range of our examples.

With respect to the participants in education, we want to put special focus on the services provided by supra-institutional units and networks for the support of higher education institutions. We regard this important, since these units and networks serve as resources for higher education institutions and in this way strongly influence the perceptions and concepts of the potential uses for eLearning in higher education. We also plan to broaden the range of descriptions of eCompetence training provisions. While we already gathered examples for practices of in-house staff training and consultancy services, we will try to find examples for provision that aims beyond the home institution.

With respect to educational technologies, we want to explore, which competences are necessary to select distinct tools out of a vast variety of options and to integrate them into a given environment. Since a surprising number of actors still finds it necessary to adapt pre-fabricated tools or even develop new ones, the skills to do so seem to be an essential requirement. Both from an administrator's perspective, and from the point of view of a developer, the ability to disseminate educational technologies and to address potential users are of great interest.

With respect to educational settings, we think it will be necessary to distinguish between single courses, complete study programmes or even scenarios, which go beyond these two types. While in a single course most of the educational design and provision is done by the individual lecturer, complete study programmes are based on the work of teams or organisational units. Therefore the relevant competences for these two settings are different. This is even more true for educational settings, which go beyond traditional settings, e.g. scenarios based on the knowledge management in shared databases or in individual portfolios.

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DIFFERENT ORGANISATONAL APPROACHES TO E-PORTFOLIOS

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Introduction

The international EPICC-project launched a survey in the autumn of 2004, with the aim of clarifying individuals' and organisations' use of ePortfolios. The objective was to find out what factors were hindering and benefiting the ePortfolio installation processes.

For the purpose of the research ePortfolio was defined as "*personal digital collection of information describing and illustrating a person's learning, career, experience and achievements. ePortfolios are privately owned and the owner has complete control over who has access to what and when*" (http://128.242.82.185/eppoll1_en.htm).

The aim in this article is to find out what differences there might be between the respondents based on the background information that they have given. This information, mainly about organisation type, is used as descriptive data when trying to make a difference between groups of respondents. Cluster analysis is used as a method to find possible differences. As a result, three different groups were found and used for further analyses.

Theory about ePortfolios

Portfolios are mainly used as are personal learning plans; only portfolios are not just common plans but as well showing the results and progress as well. Portfolios are usually used as paper versions in which learners have a kind of folio which to add all products and certificates/diplomas they receive. When using electronically created format organisation of the material eases and it is as well easier to update the material.

Portfolios are used "to effectively convey skills, accomplishment, and areas of expertise" (Heath 2003, 38). By using portfolios it is possible to find out the knowledge behind peoples ways of working and why they are using certain strategies when solving problems.

There are many different kinds of definitions for portfolio based on different target groups portfolios are aimed at and as well for the purpose of use. When creating a portfolio, whether it is in electronically or paper base format, there still exist some guidelines according of which the work becomes a lot easier. The first thing learner/teacher has to do is to determine the purpose for the portfolio. When the target is clear it is to collect relevant material.

To make an ePortfolio work there is a certain need that the institute as a whole will be committed to use ePortfolios. As well the created infrastructure must support the use and the system (Knott, Lohani, Griffin, Loganthan, Adel & Wildman 2004, 13).

It is possible to reduce the rate of dropouts by using ePortfolios as methods of course assignment. According to Lehtonen (2002) in engineering course where ePortfolios were used as method of modern digital learning environments, the number of dropouts due to low motivation decreased compared with normal engineering course. As a result Lehtonen (2002) sees ePortfolios to lead to higher satisfaction and pride among the students (Lehtonen 2002, 4).

On the next sections some of the examples of use portfolios in different user groups. Because of the groups represented in the survey the given examples are based on the groups in the survey.

ePortfolios for the students

According to Tosh and Werdmuller (2004) benefits of ePortfolios can be summarized under three different areas. They see that ePortfolio is serving as a tool for the user as well as a monitoring tool for institutions. ePortfolios can according to the writers be used as well as a mechanism for employment opportunities. (Tosh & Werdmuller 2004, 2). Benefits of ePortfolios can be as well seen from institutional side. Demonstrating more effectively graduates learning profiles and skills could help departments. (Tosh & Werdmuller 2004, 3).

Knott *et al.* (2004) sees the opportunities for ePortfolios as enabling students to easily create, manage, and share web-accessed electronic portfolios. Writers see the ePortfolios as documentation of knowledge, skills, and achievements from coursework and from extracurricular activities. (Knott, Lohani, Griffin, Loganthan, Adel & Wildman 2004, 3).

Lehtonen (2002) sees digital portfolios as possible tools that may evolve in time and might be as well seen as snapshots of the learning processes (Lehtonen 2002, 2). ePortfolios are working as means of constructing and organising students' learning environment and professional development (Lehtonen 2002, 2). ePortfolios follow the learning path that student chooses to take and documents the milestones learners wish to show as a description of his/her work. (Lehtonen 2002, 2).

ePortfolios for faculties

Knott *et al.* (2004) found teacher primary hope for students ePortfolio use as identifying possible uses of the ePortfolio and specifically to support student learning in and across the curriculum. When ePortfolios are used as delivery medium possibility for improving learning through feedback and reflection for students work rises (Knott, Lohani, Griffin, Loganthan, Adel & Wildman 2004, 10). Also when students prefer different features of software ePortfolios gives to the faculty an opportunity to support different learning styles and habits. (Knott, Lohani, Griffin, Loganthan, Adel & Wildman 2004, 10).

ePortfolios for assessors

In the research of Knott *et al.* (2004) interviewed teachers saw ePortfolios as a supporting tool for assessment of engineering programs.

Knott *et al.* (2004) recommends that ePortfolios could work as well as assessment method as means of aiding in the assessment process. With the use of ePortfolio it is possible to use software as a secure repository for all possible course assessment data collected before. When course assessment data is available for all the teachers and employers it is as well hoped that more people will look the information collected previously and see the assessment history as means of possible course changes and improvements (Knott, Lohani, Griffin, Loganthan, Adel & Wildman 2004, 13).

Research results

The total number of respondents for the survey was 148. The background information collected revealed that most of the respondents defined their roles as teachers/trainers (50% of respondents). The second largest group consisted of designers and developers. Also more than 10% respondents represented management level and research. All the other alternatives were below ten percent.

The respondents represented mainly higher education organisations. The same applied to the last role description. Only in the category of corporate and public services were the respondent percentages over 10%, all the other organisation types varied from 1% to 8%. Only 130 respondents defined their organisation types and, therefore, there is a lack of information for 12,2% of total respondents.

Previous data supports the main interest areas in the questionnaire. The main activity of the organisation was defined as teaching/training provider. Nearly 70% of the respondents included themselves to this group. Next largest groups were solution/infrastructure providers and others. None of these respondents had given more detailed descriptions about the organisations.

One of the central issues in the research was to find out whether there existed any differences between the different groups based on the background information given. In order to make a distinction between the groups a cluster analysis was made of the data. The analysis variables chosen were the three described earlier, with the variables describing personal experience with ePortfolios and building an ePortfolio.

Based on the K-means cluster analysis three groups of respondents were found. They were named, based on the main activity of organisation, as “Teachers/trainers” (N=48), “Policy makers” (N=20) and “Assessors” (N=62). The total number of people in the cluster analysis was 130. The number of people not clustered into any of these three categories because they did not give any answers was 18. When the 18 people were filtered from the data the reason for the exclusion appeared to be in all cases that they had not mentioned their type of organisation. Because this was seen as an important variable these answers were left out.

During the cluster analysis it became clear that there were some differences between the cluster groups. K-means cluster analysis is done so that the difference between the groups is maximized and the results may not represent truthfully the whole group. This, however, gives a starting point for further analyses.

According to a variance analysis performed in order to find differences between the cluster groups five questions were found to be at a statistically very significant level ($p \leq 0.001$) (I have my own eP, all or part of my eP is accessible on line, I have contributed to others’ ePortfolios, I have read ePortfolios and Building an eP). Also F-values, which describe the ratio of variances between and inside the groups, were between 21,3-50,6. The F-tests should be used only for descriptive purposes because the clusters have been chosen to maximize the differences among cases in different clusters. The observed significance levels are not corrected for this and, therefore cannot be interpreted as tests of the hypotheses of the cluster means being equal.

According to the analyses the group of teachers/trainers were most experienced with ePortfolios. They had had at least 1-2 years of experience of having an ePortfolio, having one accessible on line, having contributed to others ePortfolios and having read ePortfolios. When building an ePortfolio they had used a service provided by their employer/professional body/public authority.

The group of policy makers had the least experience with ePortfolios. The experiences they reported were mainly about beginning using ePortfolios (i.e. in process) or they had less than 1 years level of knowledge. Most of the respondents did not have experience of having an ePortfolio, nor having it online. They had not contributed or read others ePortfolios and when building an ePortfolio they had used (or planned to use) regular software.

Some things need to be mentioned when discussing about portfolios. One thing is to consider how to handle portfolios in administrative bodies. As well one important thing is how to encourage people to make portfolios. Making a portfolio needs a lot of work but makes reflection possible. One central question is also how to grade and how to order superiority? And as well to find out so-called best practises by finding out what kind of criteria exist already.

It is as well important to consider students side. Teachers should think how to guide the students. Some central issues concern portfolios and how to make one. This kind of portfolio information sessions should offer students the basic information about the background of the portfolio. Secondly it should be mentioned aloud how to work with portfolios. Also it is of very importance to speak out what is the faculties understanding of portfolios.

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A QUANTITATIVE COST EFFECTIVENESS MODEL FOR WEB-SUPPORTED ACADEMIC INSTRUCTION

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Introduction

Many universities, including leading academic institutes, are currently implementing advanced learning technologies, as a part of their existing teaching frameworks in a wide array of learning modes (AFT, 2001; Bonk, 2001; Beller & Or, 1998; Collis, 1998; Mioduser & Nachmias, 2002). As on-line learning enters the mainstream and web-supported academic instruction increases the need for explicit assessment of their cost-effectiveness, is raised.

The literature presents different approaches and methods to cost-effectiveness analysis of online learning, leading to several models:

- According to the *expressing values approach* cost-effectiveness analysis is a reflection of organization values (Thomas, 1988). These are evident in the model components, their weight and the analysis used (Alaluusua, 1992);
- The *mathematical approach* presents cost-benefit analysis using mathematical calculations (Simpson, Pugh & Parchman, 1991). These models also reflect organizational values in their components and equations;
- *Return on Investment* (ROI) models analyze cost-benefit in terms of conceptual and operative calculating procedures (Phillips & Phillips, 2003). Classical ROI models use financial terms. Formal ROI procedures are complex and hence Moonen (2001) presents an alternative to ROI operation, referring to institutional, pedagogical and technological perspectives, as well as to qualitative economical efficiency (Simplified ROI);
- The *comparative approach* is the most common approach in cost-effectiveness assessment of technology in education (Bishop, 2002; Twigg, 2000; Curtain, 2002).

Although cost-effectiveness assessment can determine effectiveness of a single project, identify unexpected benefits or provide guidance for management decision-making on technology use in education (Levin & Mcewan, 2001), most studies focused on cost-effectiveness measurement of online learning in comparison with traditional face-to-face instruction (Cukier, 1997; Rumble, 2001). Furthermore, effectiveness is measured according to the traditional ‘class’ model, not always reflecting new learning practices stemming from exposure to innovative technologies.

Cost-effectiveness models in the literature do not apply to new needs and characteristics rising from the rapid pace of Internet implementation in academic instruction. This study, hence, offers to develop a quantitative model for measuring cost and benefit of blended learning that applies also to traditional universities that implement web-supported instruction in various modes. The model we present stems from existing models, and attempts to integrate ideas and concepts from them. The main characteristics of our quantitative cost-effectiveness model are: a) it was designed primarily for assessing blended learning cost-effectiveness (rather than distance learning only), b) it is based on empirical data regarding students usage, using web-mining techniques, c) it provides a quantitative description of the main cost-effectiveness components of blended learning for students, instructors and the university, and d) the calculations that translate the cost-effectiveness components of blended learning into quantitative values are easy to use and perform almost automatically.

In this paper we will describe the model, its cost and benefit components, and its development process.

A Cost-effectiveness model for web-supported academic instruction

The cost-effectiveness model presented in this paper is an attempt to develop computational mechanism that will provide a quantitative translation of the main cost-effectiveness components of blended learning. The model (Figure 1) includes cost components related to infrastructure and instruction, and benefit components related to improving instruction quality, improving affective aspects, increasing efficiency of teaching and learning processes, and facilitating knowledge management (for more details see Cohen *et al.,* 2004). A different measure will be developed for each of the model components, enabling its calculation and quantification in relation to each of the three main actors involved in the learning process: students, instructors and the academic institution (as suggested by Moonen, 1999).

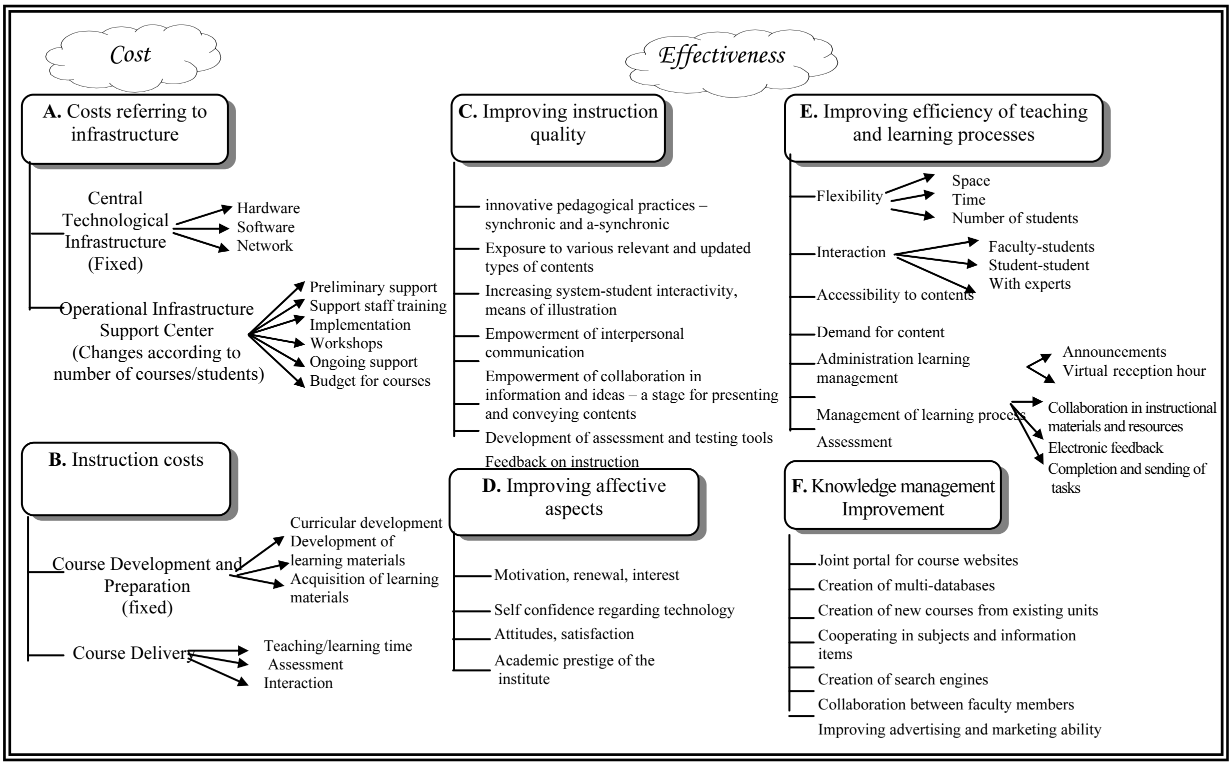

Figure 1. Components of Cost-Effectiveness of Academic Web-Supported Learning

Components of the Model

The cost components

The proposed model includes two cost dimensions (see Figure 1, A-B); infrastructure and instruction costs.

A. Infrastructure costs – Technological infrastructure costs, as central infrastructure and equipment costs (e.g. servers, software and communication). And Operational infrastructure costs, as central institute support center, training, workshops, as well as continuous technological and pedagogical support (i.e., preliminary and ongoing support for faculty and students, and implementation costs).

B. Instruction cost – Course development and preparation, costs of curricular development and course production; these costs are reflected in the amount of instructional materials embedded in the website. And instruction/learning costs including assessment time and interaction time with students.

The benefit components

The model presented in this paper includes four benefit dimensions (see Figure 1, C-F):

C. Improving instruction quality – This dimension deals with improving effectiveness of pedagogical aspects of teaching and learning processes by enriching the learning environment (e.g. using simulations, asynchronous communication among students).

D. Improving affective aspects – This dimension includes increasing students and instructors motivation, interest, self-confidence and satisfaction.

E. Improving efficiency of teaching and learning processes – This dimension includes all the time saving costs reduction resulted by the implementation of the Internet (e.g. reducing students library time, saving classroom costs).

F. Knowledge management improvement – The usage of the management system enables effective knowledge organization. Furthermore, it allows greater collaboration and information exchange and sharing of resources and instructional materials (e.g. using the course website over the years, or sharing it with other instructors).

The Computational Model

For each one of the cost and benefit components of the model computational functions (Y=f(X)*M) are defined. These functions calculate quantitative value for each of the three main actors involved in the learning process: students, instructors and the academic institution. The indicators ($X(x_1 \ldots x_{50})$) are independent variables that characterise the web based teaching processes and their usage by students (see Figure 2). The cost-effectiveness parameters ($M=\{m_1 \ldots m_{36}\}$) translate the costs or benefits derived from the independent variables to a quantitative value to terms of "coins" on a cost-effectiveness scale derived from different categories according to the model dimensions (see Figure 3). "Efficiency coins", are the result of saving time and money, "quality coins" indicate the increasing of the quality of instruction and learning, and "affective coins" represent the creation of satisfaction, prestige and motivation. Anyone that uses the model can defines these parameters for each measurement of the model components according to case-sensitive predisposition.

<table>
<tr><th colspan="2">Log files Data (Empirical data)</th></tr>
<tr><th>Courses websites characteristics: $X=\{x_1 \ldots x_{25}\}$</th><th>Usage of websites: $X=\{x_{26} \ldots x_{50}\})$</th></tr>
<tr><td>x_1- Num. of students
x_2- Num. of course instructors
x_3- Num. of teaching hours per semester
<u>Content variables</u>
x_5- Num. of Content items
x_{17}- Num. of linked items
<u>Communication variables</u>
x_{10}- Num. of polls
x_{11}- Num. of forums items
x_{13}- Num. of bulletin boards items
x_{19}- Visible phonebook
<u>Webagogies variables</u>
x_4- Num. of web-pedagogies ("webagogies")
x_{18}- Num. of learning units
$x_{14\text{-}16}$- Num. of simulation/ video/ picture files
<u>test/exercise variables</u>
x_{20}- Num. of assignments/tests
x_6- Num. of exercises
x_8- Num. of question items
x_9- Num. of evaluation items
<u>Knowledge management variables</u>
x_{22}- Num. Of courses collaborate knowledge base (sons)
x_{23}- Num. Of instructors/ co instructors attributed the site
x_{24}- Num. Of sites function as knowledge base course
x_{25}- Num. Of items in knowledge base course</td><td>x_{26}- Num. of hour converted to online work
<u>Content/ webagogies usage variables</u>
x_{28}- Num. of views in item (students &instructors)
x_{29}- Num. of students views in item
<u>Communication usage variables</u>
x_{30}- Num. of students participant in forums/bulletin boards
x_{31}- Num. of forums messages (total messages)
$x_{32\text{-}34}$- Num. of instructor/ co-instructor/ students forum messages (1st level)
$x_{35\text{-}37}$- Num. of instructor/ co-instructor/ students forum reply messages (2nd level and up)
x_{39}- Num. of instructor announcements
x_{40}- Num. of bulletin boards messages (total messages)
$x_{41\text{-}43}$- Num. of instructor/ co-instructor/ students messages in bulletin board
x_{45}- Num. of students performed the polls
<u>Assignments performance variable</u>
x_{38}- Num. of attachments in forums messages
x_{44}- Num. of students performed the assignments
<u>Knowledge management usage variables</u>
x_{46}- Num. of reuse of the course website
x_{47}- Num. of website duplications
x_{48}- Average num. of sites for student
x_{49}- Average num. Of sites for instructor
x_{50}- Num. Of courses in the portal</td></tr>
</table>

Figure 2. Independent variables from Log files Data

Benefit Parameters

Efficiency improvement (Saving time and money) **benefits type T:** $\mathbf{M_{(1\text{-}22)}=\{m_1 \ldots m_{22}\}}$

t_1- Saving time in content items consumption
t_2- Saving time in arrival to the campus
t_3- Saving time in getting/ delivering announcements
t_4- Saving instruction time
t_5- Saving time in checking tests/exercises and grads management
t_6- Saving time in updating the site
t_7- Saving drive and parking costs
$t_{8\text{-}11}$- Saving copying / printing costs (articles, announcements, assignments, exercise)
$t_{12\text{-}14}$- Saving room / lecturer hall / lab costs
$t_{15\text{-}18}$- Saving instruction costs (instructor/ teacher assistant/ laboratory assistant costs)
t_{19}- Saving administration costs due to the fact that procedures run automatically in the web
$t_{20\text{-}21}$- Saving lab equipment (increasing equipment utilization or saving in consumed equipment
t_{22}- Saving professional tours

Quality improvement as a result of: **benefit type Q:** $\mathbf{M_{(23\text{-}29)}=\{m_{23} \ldots m_{29}\}}$

q_1- Activity quality
q_2- Self exercise
q_3- Accuracy in checking test & exercise
q_4- Immediately feedback
q_5- Question test/exercise analyzing
q_6- Knowledge representation richness and variety
q_7- Graphic representation of poll results

Affective improvement as a result of: **benefit type A:** $\mathbf{M_{(30\text{-}36)}=\{m_{30} \ldots m_{36}\}}$

a_1- Interaction improvement (by forums & bulletin board)
a_2- Interaction improvement between instructor & students
a_3- Interaction improvement between students & students
a_4- Interaction improvement by phonebook
a_5- Strengthening interest
a_6- Enhancing prestige
a_7- Usage simplicity/ convenience

Figure 3. Benefit Parameters $M=\{m_1 \ldots m_{36}\}$

An Example

The following is an example that demonstrates the computational model of one benefit component: the time saved by student by the access to digital content. This component belongs to the model dimension E: “improving efficiency of teaching and learning processes”. The function $Y=\Sigma X_{ij}*t_i$ calculates the time saving derived from posting content items on the course website (Content item is a general name for all types of information uploaded into a course websites on the web for students use). X_{ij} represents whether student j (j=1…m) viewed content item i (i=1…n). Summing X_{ij} over all the m students represents the extent the i^{th} content item was viewed by all students. Multiplying the result by t_i – a parameter represent the assumed time saved by the uses of the i^{th} content items (e.g. t_i of digital paper can be 10 minutes or any other value that represent by the student) gives the total time saved by students that actually viewed this item. Finally, summing this value over all the n content items of a course represents the total time saved by the actual use of the n content items by all m students in the class.

In this particular example we demonstrate the calculation of one “coin” (time) of one participant (the student) of one variable of the model. In a similar way all other cost-benefit components values are defined and calculated. Our proposed computational mechanism is the collection of all functions (Y=f(X)*M). This mechanism input is the indicators and parameters, and the output is the cost effectiveness values in three different coins for each of the three participants (Figure 4).

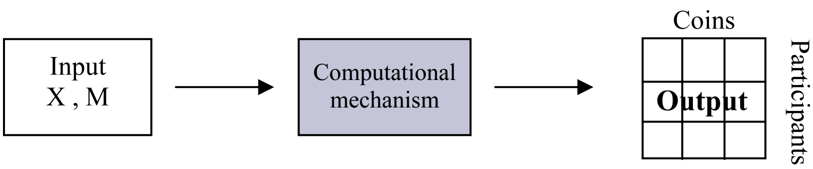

Figure 4. The computational model

Although the development process is tedious and includes extremely many definitions, the usage of the model will be rather simple. All definitions of the functions and the parameters will be represented as a spreadsheet file, the input data will be produced for each course by the web-supported shell, and the computational mechanism will process the data to produce the desired output.

Stages of the model development

Our cost-effectiveness model is developed in four stages:

Stage 1: the model design

In this stage, based on the literature review the major components of cost-effectiveness were selected and defined these components are summarized in Figure 1. Also the indicators $X=(x_1 \ldots x_{50})$ were defined as summarized in Figure 2.

Stage 2: the creation of the computational mechanism

In this stage all functions (Y=f(X)*M) are developed and the values of the parameters are determined. The major product of this stage is rather complex spreadsheet file that contain the computational model.

Stage 3: model evaluation by experts

In this stage, five web-based academic instruction experts will be interviewed to examine their agreement with the model components, their characterization and the various functions and parameter of the computational mechanism.

Stage 4: model validation by instructors and students

In this phase, cost-effectiveness analysis will be performed using the developed model on a representative sample of courses (case studies). The functions and the parameters values will be examined and validated by interviews with the courses instructors and students.

Following stages 3 and 4 will be fine-tuned according to interviewees' responses.

We hope that this model will modestly contribute to the body of knowledge on web-supported academic instruction cost-effectiveness, shed light on the linkage between the two and provide a framework for comprehending its components. We foresee that this framework might be applicable for learning about the costs and the benefits of the implementation of the Internet in academic institutions instruction, both by the instructors and also as a tool for examining return of investment by university policymakers. Finally we hope that our cost-effectiveness model will serve as a possible reflective tool of the emerging trend of on-line instruction and blended learning.

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A PARTICULAR ASPECT OF COST ANALYSIS IN DISTANCE EDUCATION: TIME

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Introduction

Cost analysis of educational and lifelong learning programs is a recent research interest when compared to other types of program evaluation. Economists developed the concepts of "cost-effectiveness and cost-benefit" in the 1930s and 1950s respectively, but it was not until the 1960s that this new approach was used to access efficiency in the educational sector (Levin, 1991). Nevertheless, researchers were interested in the theoretical perspective of cost analysis, and not in its real application. At least three factors have complicated the application of this tool in education: (1) difficulties associated with the conceptualization and application of cost and effects, (2) issues associated with the identification and justification of the distribution of costs and effect across stakeholder groups, and (3) factors that have limited the generalization of the conducted studies (Rice, 1997).

The goal of this paper is to stress a particular aspect of cost-effectiveness analysis in distance education: time. The starting point of our reasoning is a critique the classic media equivalence hypothesis that leads us to consider time and its dimensions as a peculiar component of the cost-effectiveness index. Following this intuition, we break down the cost-effectiveness index in two parts in order to obtain a "time-effectiveness index". In the final part of the paper, this index is theoretically analysed using a microeconomic approach.

1. The media equivalence hypothesis

Much of the research regarding distance education compares distance education to traditional, face-to-face instruction. Reviews of the literature support the often-quoted work by Russell (1999), The No Significant Difference Phenomenon, which compiles 355 sources dating back to 1928 that do not find a significant difference between distance and classroom-based education. This finding of "no significant difference" is also in keeping with earlier works by Schramm (1977) and Clark (1983). Schramm states, "Learning seems to be affected more by what is delivered than by the delivery medium". This hypothesis in Clark's strong version is often referred to as media equivalency hypothesis: "The best current evidence is that media are mere vehicles that deliver instruction but do not influence student achievement any more than the truck that delivers our groceries causes changes in our nutrition. Basically, the choice of vehicle might influence the cost or extent of distributing instruction, but only the content of the vehicle can influence achievement". In fact, researchers have had difficulty demonstrating consistent relationships between levels of resources generally, and presumably what those resources might purchase, and student learning" (Clark, 1983).

2. Cost-effectiveness analysis: a necessity

Supporters of Clark's media equivalency hypothesis, and Clark himself, do not observe that the choice of a particular vehicle influences the achievement time. In fact, two different types of courses, having the same effectiveness, could require a different investment in time to the learners and, obviously, the alternative which is less time-consuming is the more attractive. Therefore, in comparing two or more educational technologies, it is sufficient to consider the aspects related to the outcomes, the achievement, and also those aspects related to input, as the learning time or all the other aspects affecting the intervention costs.

Cost effectiveness is the most suitable tool for this research since cost-effectiveness analysis provides the means of estimating the cost of two or more educational alternatives, as well as the effectiveness of each alternative in producing a common outcome.

2.1 The effectiveness aspect

A correct use of this tool requires that the alternatives being considered have common didactic objectives so that their results can be readily compared. According to Mager, didactic objectives are statements that describe what the learner is expected to achieve through of instruction (Mager, 1975). This definition relies on the fact that knowledge is an unobservable characteristic and, consequently, the user's knowledge would be estimable only by observing behaviours, such as the answers given to a multi-choice questionnaire or the interactions during a complex simulation (Bee, 2003).

In the perspective of a cost-effectiveness analysis that is oriented to evaluate meaningful learning (Novak, 1998), the assumption of Mager Theory is however non-exhaustive. The concept of "learning" implies the evolution of a system of knowledge in a temporal interval and it presupposes the possibility to measure and verify such evolution.

Therefore, if the observation of behaviour can be a probable projection of a particular state of mind, then it is necessary that it is accompanied by a set of further control mechanism (Cohen at al., 2000). In particular, verification consists of the observation of behaviours directly or indirectly connected to the preceeding behaviours, in accordance with a diagram of relationships that increases probability of the correspondence among the observed behaviour and a specific status of the mind.

Therefore, an evaluation of the learning requires an emphasis in terms of instructional design and a new definition of the relationship among behaviours and systems of knowledge. From a holistic point of view (Quine, 1969), it is not possible to observe a single behaviour but a system of behaviours. To every system corresponds a structure of knowledge, a mental model, in accordance with the MMT (Mental Models Theory) by Johnson-Laird (1983). The integration of the MMT and the Mager method requires a translation of the systems of information in analytical diagrams ("trees of didactic objectives"), with indications about the level of complexity of the aggregates.

One of the advantages connected to the adoption of this method of instructional design consists of the possibility to rigorously produce assessment tools in an isomorphic relationship with the didactic objectives systems. This approach supports the control and the verification of the conditions of validity and reliability in the tests and in the network of the whole system of learning evaluation.

The further advantage of this method consists of a formulation of the systems of knowledge which conform to the e-learning standards (IMS, HR-XML, OWL). Apart from the various kind of observations – highly structured, naturalistic, semi-structured, unstructured (Cohen *et al.,* 2000) – it guarantees the possibility of directly or indirectly monitoring the process by the most recent generation of LMSs.

2.2 The cost aspect

Cost also needs to be measured in a uniform way, relying on the ingredients or resource method (Levin & McEwan, 2001). The ingredients method is based on the fact that every intervention uses ingredients that have a value or cost. If specific ingredients can be identified and their costs can be ascertained, then we can estimate the total costs of the intervention as well as the cost of effectiveness per unit (Levin & McEwan, 2001). Using this information, it is easily determinable which alternative yields the highest educational effectiveness for a given cost or the lowest cost for any given level of educational effectiveness (Levin, 2002). Cost-effectiveness analysis is fundamentally a comparative tool: it allows us to choose which of two or more alternatives are relatively more cost-effective, but it does not tell us which the best alternative is in an absolute sense (Levin, 2002).

To compute the cost-effectiveness index (CEI) for a particular educational offer it is necessary to divide its total cost (C) by its effectiveness (E):

$$[1] \qquad \mathrm{CEI} = \frac{\mathrm{C}}{\mathrm{E}} = \frac{\breve{\mathrm{C}}}{\mathrm{E}} + \left(\frac{\mathrm{T}}{\mathrm{E}}\right) \cdot \mathrm{w}$$

where

T = total learning time required to obtain the effectiveness E;

mv = monetary value of each unit of learning time;

$\breve{\mathrm{C}} = \mathrm{C} - \mathrm{T} \cdot \mathrm{mv}$.

We call time-effectiveness index (TEI) the ratio T/E. This index can be interpreted as the learning time required to obtain a single unit of effectiveness.

3. Learning time

The calculus of TEI, time-effectiveness index, of a course is based on the possibility to measure the effects of the didactic intervention in relationship to the temporal dimension. In particular, it has to be possible to compare the expected time of learning ($\bar{t}$) with the real amount of time the student takes to complete assigned behavioural and didactic objectives.

Such relationship is strategic to define the effectiveness of a didactic intervention. In the distance learning market the temporal variable constitutes a fundamental element for the quotation of the trends and it plays a fundamental role in the scheduling and in the management of the variables of an educational project. On the basis of the number of involved consumers, this variable is able to represent a critical element for a company that decides to invest in the training of its employers during the working hours; especially in the cases of a remarkable difference between planned learning time and real learning time, the amount of time the student takes to achieve the expected outputs (appraisable only with hindsight). The capacity to schedule and quantify the probability (*ex ante* and *in itinere*) that it verifies a removal between expected time and real time constitutes an element of strength in the planning and layout of courses characterized by an elevated level of complexity. The definition of a range of fluctuations is in fact able to support the integration of corrective resources and activity during the process and allow a more analytical definition of risk level.

The definition of the real time of learning relating to a distance course does not constitute a problem. The really necessary element is an analysis of the course complation rates and of the activity of the students in the time interval examined. Naturally, the reliability of this data is consistent with the possibility to verify the link with the objectives. The evaluation of the course completion is not enough. In fact the consumer would be able to spend too much time without getting any output. It is more useful to calculate the real time in a controlled fruition system, where all the units of theory have to be in relationship with tests of verification by a system of correspondences that allows the student progress to be verified and of the whole student group in terms of learning.

The matter of the calculus of the value of the expected time of learning remains open. In our method, the expected time of learning is conditioned (a) by quantity of information to visualize and memorize – the variable of the semantic density –, and (b) by complexity level of the relationships between the concepts – with reference to the Bloom taxonomy (Bloom, 1972) and to the pattern of "expanded" skill-cycle (Romiszowski, 1999).

In accordance with this model, every didactic objective may be represented as a bidimensional vector, whose component is the semantic density (SD) and the complexity level (CL). The integration of these variables (the normalization of the vector) determines the absolute weight (W) of that system of information (s):

$$[2.1] \qquad \mathrm{W(s)} = \sqrt{\mathrm{SD}^2\,(\mathrm{s}) + \mathrm{CL}^2\,(\mathrm{s})}$$

This output, W(s), does not take account of the characteristics of the students and it refers essentially to the single system of knowledge linked with a specific didactic objective. two further steps will be necessary to formulate a reliable forecast about the time of learning relating to s: (a) the definition of a multidimensional vector that add-in the variables that characterize the student group, the so called "learning resistance" (R); (b) the composition of W(s) with R:

$$\bar{t}(s) = W(s) \cdot R \qquad [2.2]$$

4. The time-effectiveness index

For simplicity, we consider a market composed of two firms: the first (D) demands an on-line course in order to increase a particular knowledge in a group of n employees; the second is the seller (S) of the on-line course. The seller assures the buyer that the course takes a time $\bar{t}$ to obtain a targeted level of didactic effectiveness. The effectiveness can be measured using a value added approach. The basic idea of this method is that education and training should be judged according to the change in their students' performance during their time in instruction. This is obtained comparing by students' finals scores with their results in a pre-test taken before they attended the course. Value added indicators measure the difference in performance between the pre and final test. Cowan (1985) suggested this particular application of the added value approach:

$$e_j = \frac{F_j^{test} - P_j^{test}}{MAX - P_j^{test}} \qquad [3]$$

where

e_j = course effectiveness for the j[th] learner;

MAX = maximum score achievable in the final test;

F_j^{test} = j[th] learner final test score;

P_j^{test} = j[th] learner pre-test score.

Using Cowan's index, for the j[th] user, the effectiveness of an educational offer is the ratio between the change in his/her performance, the numerator, and his/her knowledge needs before attending the course, the denominator.

Given this information, the buyer will acquire the course considering the following expected time-effectiveness index:

$$E(TEI) = \frac{\bar{t}}{\bar{e}} = \frac{\bar{t}}{\left(\sum_{j=1}^{n} \frac{F_j^{test} - P_j^{test}}{MAX - P_j^{test}} \right) \cdot \frac{1}{n}} \qquad [4]$$

However, normally, at the end of the on-line course, only a percentage p of the n learners reaches the targeted effectiveness in the time $\bar{t}$; the remaining learners need extra time to reach the same objective. We suppose that the extra time (k) is a constant:

$$t = \bar{t} + k \qquad \text{with} \qquad 0 \le k < +\infty \qquad [5]$$

The average learning time is than:

$$\begin{aligned} \overline{T} &= p \cdot \bar{t} + (1 - p) \cdot (\bar{t} + k) = \\ &= \bar{t} + (1 - p) \cdot k \end{aligned} \qquad [6]$$

in addition, the time-effectiveness index after the course is:

$$TEI = \frac{\overline{T}}{\bar{e}} = \frac{\bar{t} + (1 - p) \cdot k}{\left(\sum_{j=1}^{n} \frac{F_j^{test} - P_j^{test}}{MAX - P_j^{test}} \right) \cdot \frac{1}{n}} \qquad [7]$$

By comparing the [3] and the [6] it follows that the total extra time invested by the buyer to create (or increase) a particular knowledge in a group of n employees is:

$$[8] \qquad \mathrm{EXT} = n \cdot (1-p) \cdot k$$

which depends on the percentage p:

$$[9] \qquad \begin{cases} \text{if } p = 0 & \text{than } \mathrm{EXT} = n \cdot k \\ \text{if } 0 < p < 1 & \text{than } 0 < \mathrm{EXT} < n \cdot k \\ \text{if } p = 1 & \text{than } \mathrm{EXT} = 0 \end{cases}$$

What do these formulas mean? It simply means that there is a direct relationship between p and the quality of the target analysis activity made by the seller: high levels of p indicate a high quality of the target analysis activity; *vice versa*, low levels of p indicate a low quality of the target analysis activity. The connection between these two aspects could justify a flexible agreement between the seller and the buyer of an on-line course that is an agreement relating the price paid for the course to the probability (the percentage p) to obtain a previously established learning outcome in the time $\bar{t}$.

How can the seller foresee the percentage p? It is clear that the quality of the target analysis is related to the amount of money invested in this activity (C_A) and consequently:

$$[10] \qquad p = f(C_A)$$

It is also quite clear the shape of this relation:

$$[11] \qquad \frac{df(C_A)}{dC_A} > 0 \; ; \qquad \frac{d^2f(C_A)}{dC_A^2} < 0$$

that is the percentage p increase when C_A increase, but a decreasing rate. This particular functional form can be by a Cobb Douglass like this:

$$[12] \qquad p = \alpha \cdot C_A^{\beta}$$

The logarithmic transformation of [12] gives us a simple linear model to estimate econometrically the parameters α and β:

$$[13] \qquad \begin{aligned} \mathrm{Log}(p) &= \mathrm{Log}(\alpha \cdot C_A^{\beta}) = \\ &= \mathrm{Log}(\alpha) + \beta \cdot \mathrm{Log}(C_A) \end{aligned}$$

Using this model the seller can estimate the parameters α and β delivering an on-line course to experimental groups with a similar learning resistance, and using the estimated parameters to predict p when the course is delivered to one or more users with the same characteristics (learning resistance) of the control groups.

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A COST-BENEFIT ANALYSIS OF THE WEB-BASED PHARMACEUTICAL SCIENCE PROGRAM AT UMEÅ UNIVERSITY, SWEDEN

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1. Introduction

The purpose of this paper is to illustrate the national economic consequences of effecting a web-based distance education. The analysis will be carried out at both a national and a regional level. Since economic costs and revenues are identified and wherever possible evaluated, we base our analysis on the web-based Pharmaceutical Science Program that started at Umeå University, autumn 2003[1].

In the light of the Swedish government's aim, that 50 percent of those who annually leave school should continue on to higher education before the age of 25, together with the vision of lifelong learning which is becoming increasingly important to meet the requirements of the labour market for qualified workers, it is of interest to examine web-based education from a national economic perspective. Further, the accessibility of education and training is regarded as one of the most important factors in the achievement of growth and equity[2]. Educational policy is regarded as one of the political areas where investments and contributions have great importance for regional development. The state, as well as municipal authorities, invests a great deal of resources in higher education. Many of the municipal authorities involved in education struggle with problems such as negative net migration rates and high levels of unemployment. The possibility of getting an education located in the municipality which corresponds to the needs of the local labour market, is regarded as positive, but it also entails high costs for the municipalities, who in many cases already suffer from a strained municipal budget. To form an opinion as to whether or not investment in web-based distance education can be regarded as profitable from an economic perspective, we have carried out a cost-benefit-analysis. The national perspective has been augmented with a regional perspective.

The purpose of this paper is to survey relevant costs and revenues associated with the implementation of web-based distance education in general and the web-based Pharmaceutical Science Program in particular, and to perform an economic analysis of the web-based Pharmaceutical Science Program at Umeå University and with the aid of this obtain an indication of whether educational investment is profitable from a national and a regional perspective.

1.1 Method

The method used is the economic evaluation method cost-benefit analysis (CBA). CBA is an economic method that aims to systematically describe and measure the effects of a project or action. The method makes it possible to establish a long-term perspective over time and a broad perspective, i.e. the method enables us to take side effects into consideration.[3] Identified costs and revenues are later compared with the effects that would have occurred if the project or action had not been carried out. In the case of the Pharmaceutical Science Program, it is necessary to compare identified costs and revenues with a hypothetical situation in which the education never took place.

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[1] This study is a part of the evaluation commission that the Centre for Regional Science, CERUM, at Umeå University has accepted from the faculty of Science and Technology. The evaluation is part of the project Swerecept financed by the National Joint Action committee (Samverkansdelegation), established by the Swedish Government. The purpose of the committee is to stimulate regional co-operation between, among others, universities and municipalities. Earlier published reports within the framework of the evaluation are: Nordström, A. (2004), Nordström, A. & Englund, C. (2004) and Nordström, A. (2005). Available only in Swedish.

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The effects of a project or action do not necessarily need to be of an economical nature, which means that the method must take into consideration effects that do not directly correspond directly to payment flows[4]. A common example of this is effects on the environment. When it comes to educational ventures, a typical example is the increase in students' well-being as a result of the education. Another is the possible dissemination of knowledge that occurs when the experiences and knowledge acquired by participating teachers are later utilized on other occasions.

The relevant literature presents many suggestions on how to structure implementation of a CBA[5]. We have chosen to summarize our study in five steps. *Step one* is a definition and involves establishing what the effects of the project are to be compared with, and what the prerequisites of the analysis are. In *step two* the effects of the project are identified, in accordance with the prerequisites established in step one. Non-economic and external effects are also identified here. In *step three*, the identified effects are evaluated and the non-monetary effects translated to monetary with the aid of i.e. willingness-to-pay surveys. If market prices do not correspond to economical values, adjustments must be made. In *step four*, the identified costs and revenues are discounted. This is carried out since costs and revenues in an economic analysis frequently occur at different points in time, and therefore must be returned to the same point in time to obtain comparability. When discounting, a rate of interest that reflects the preferences between consumption today and future consumption is used. A positive discount interest is generally used. When the discount interest is positive, the assumption is that individuals in a society prefer consumption today to future consumption. The higher the discount interest used in the analysis, the less value future revenues of a project have when the value of revenues are returned to the starting point of the project. To determine if a project is economically effective or profitable, different criteria for decision-making are used. A common procedure is to carry out a present value test (*step five*). In this test the present value of the project's costs and revenues are compared. The criteria for decision-making are if the sum of the discounted revenues exceeds the sum of the discounted costs, the project should be implemented or the project is profitable. The Present Value (PV) of costs or revenues (X) obtained at the point in time t, which is discounted using a rate of interest i may be expressed as follows:

$$PV_t = X_t(1+i)^{-t}$$

The criteria of decision making if the discounted revenues exceed the sum of discounted costs may be expressed such that the project should be implemented if the Net Present Value, NPV>0. This can also be expressed as follows:

$$NPV = \sum R_t(1+i)^{-t} - \sum C_t(1+i)^{-t}$$

Where R is project Revenues and C is project Costs. Performing a CBA involves uncertainty and to reduce this, sensitivity analyses are performed. These analyses examine how the Present Value is influenced by changing parameters in the equations. It is common to experiment with different rates of discount interest and different timelines.

1.2 The Pharmaceutical Science Program at Umeå University

The Pharmaceutical Science Program began in the autumn of 2003 and is part of the standard curriculum at Umeå University. The program is Internet-based and is offered to students in two forms, as a distance study group and as local study groups located in various rural areas. The program was initiated in response to the expressed request of Apoteket AB, which receives the largest number of pharmacists. The number of applicants to the program indicates that great interest from prospective students.

Those students who are studying this program at present are on the average older than the average campus student. It is also the case that a large proportion of these students' living conditions are such that they are rooted in their present residential area, which makes the Internet-based educational form suitable for these students. Close to 80 percent of the students are, for example, married and more than half have children. The majority do not live near a university, either. More than 60 percent of the

[4] Dahlberg, Åke (1990)

[5] Bohm, Peter (1996), Spash, Clive & Hanley (1993), Mattsson, Bengt (1988)

students own their residence and have only moved to another address 1.4 times over the last 10 years. Nearly 60 percent also claim that they would not have begun studying if this program had not begun its Internet version. Finally, the majority state that they wish to work in the area they live and that the economic compensation they require to consider moving is in most cases unreasonable and in principle everyone states that factors aside from money influences their choices, primarily family situation is decisive for choosing a place to work. One purpose behind offering an Internet-based Pharmaceutical Science Program has been to reach this type of student. This facilitates Apoteket AB's recruitment of pharmacists in the interior of Northern Sweden where there is a severe shortage of pharmacists. The results obtained lead to the conclusion that this is a new group of students who are relatively well rooted in their home region. This conclusion is of great importance when determining how many people will be staying in the region upon completion of their studies. A reliable assessment of the tendency to move is important for the results in a regional economic analysis.

1.3 The region

In the regional analysis, we have chosen to define the region as the municipalities collaborating in the municipal federation Akademi Norr[6]. This is made up of 13 municipalities in Northern Sweden, the majority of which have experienced problems with negative net migration and high employment rates. The Gross Regional Product of these municipalities, a measure of the aggregate value of all products and services produced in a region in one year, is below the national average[7]. Aside from these 13 municipalities, our region includes the municipalities of Skellefteå, Umeå and Örnsköldsvik. In this way we include all the municipalities involved in the Pharmaceutical Science Program during the program's first three admissions.

2. Definition, delimitation and assumptions

The first step of a CBA involves establishing what the effects of the project are to be compared with and the prerequisites of the analyses.

The comparison alternative is presumed to be that no equivalent education would be offered to the students. Within the framework of this study, we have been unable to evaluate all the costs and revenues defined which are associated with this educational venture. We also wish to emphasize an ex-ante analysis based on budgeted costs and future revenues, which creates a degree of uncertainty in our results. The analyses assume that 230 students will graduate from the three admitted groups[8].

We have also made the following assumption in the analysis: the timeline is set to 30 years, the discount interest rate is set at 4 percent, students who at the time of application were unemployed, studying or at home taking care of their children are allotted a starting income commensurate to the average wage of students who had employment at that time, students are assumed to work two months during their summer break during their education, everyone who completes this education will work full-time as pharmacists until they receive pension and finally all cases of unemployment, parental leave, sick leave and death are discounted.

3. Identification of costs and revenue

When applying CBA on Internet-based distance education, the following costs can be identified: the value of the products and services in the alternative case which would have been produced by students in the program; the value of production in the alternative case from the employees (e.g. teachers, technical and administrative staff); wear and tear on the machines and fixtures used in the alternative case, the value of the rooms used for education in the alternative case, the value of the resources used by the collaborating learning centres' in the case of alternative use.

[6] The main purpose of Akademi Norr is to locally create goal-oriented university and college programs.

[7] www.regionfakta.com

[8] In the fall of 2003 100 students were admitted; in the fall of 2004 80 students were admitted; planned admission for the fall of 2005 is 50 students.

The following revues may be identified: the value of the products and services produced by students that complete the program, the value students credit the program for improving their personal development, the value students assign to the possibility of studying near one's home, the value of the effects on migration, employment and the creation of new businesses in the participating municipalities.

All the costs defined above will be entered into the analysis of the Internet-based Pharmaceutical Science Program. When it comes to revenues, only the value of the products and services in the alternative case which would have been produced by students in the program will be entered. Most of the costs can be ascertained from the internal budget of the Pharmaceutical Science Program. The value of the products and services in the alternative case which would have been produced by students in the program is approximated by their wages in the alternative case. To obtain total economic value, gross income is multiplied by supplemental wage costs. The same adjustment upwards is made on the revenue post in the analysis, i.e. the value of the products and services produced by students in the program.

4. Economic analysis

4.1 National perspective

Costs for the Pharmaceutical Science Program are divided into basic costs and additional costs, see Table 1. Basic costs consist of wages to local instructors, equipment, wages for student administration, the persons responsible for the program and program study councillors, operation of the planning group and costs specific to the department[9]. Additional costs consist among other things of costs for development and production of web-based course modules and teacher education. The costs for learning centres are the costs the participating learning centres have for their operation as well as specific costs attributable to the Pharmaceutical Science Program[10].

Table 1: Costs by financers

Financer	Basic costs	Additional costs			Total financer
		Dev. & prod.	Education teachers	LC-costs	
State funds; student subsidy	4,164,270	329,374			**4,493,644**
State funds; Umeå University		227,817	57,640		**285,457**
Umeå		219,582			**219,582**
Skellefteå		175,666		146,571	**322,237**
Sollefteå		175,666		135,702	**311,368**
Arvidsjaur		32,937		56,982	**89,919**
Vilhelmina		32,937		85,966	**118,903**
Örnsköldsviks		41,172			**41,172**
Akademi Norr		54,896			**54,896**
Total	**4,164,270**	**961,002**	**57,640**	**425,221**	**6,075,493**

Total economic costs to run the program over three admissions dates come to EUR 5,937,177. These costs occur at different points in time and we must therefore discount the cost to obtain comparability. At a discount interest rate of 4 percent, the cost becomes EUR 5,375,167. Costs are calculated over three admissions totalling 230 students. The economic cost per student is thusly EUR 23,374.

[9] This can involve e.g. wages to teachers, technical and administrative staff, and equipment and operative costs.
[10] The Pharmaceutical Science Program's share of the costs has been calculated by dividing operating costs by the number of students at the learning center and then multiplying this by the number of students of pharmacy studying at each learning center.

The economic revenue which will be entered into the analysis is, as mentioned earlier, the value of the increase in production which individuals participating in the program will contribute as pharmacists. This production increase is approximated through the individuals' wages. The wage these individuals will receive as pharmacists is compared to the wage they would have received if they did not complete this education. The individuals' wages as pharmacists is revenue in the analysis while the wage earned in the alternative case is a cost. The increase in production is expressed by the difference between these revenues and costs. The following wages were used in the analysis: a newly educated pharmacist EUR 2,088; average pharmacist with 5-20 years in the profession EUR 2,493 and pharmacists with an average of 20-30 years in the profession EUR 3,097.

We have now established the wages we will be using to approximate the increase in production students will contribute due to their education as pharmacists, after completing the education and working full-time as pharmacists until the age of 62. This increase in production is reduced by the production of the individuals in the alternative case. Wages were established using information from surveys answered by the students when they began the program. Starting wages are assumed to be EUR 1,724. Wages are subsequently increased to EUR 2,240 and finally EUR 2,371.

4.1.1 Results and sensitivity analysis

If the program is offered to the 230 students presently scheduled for admission and at a discount interest rate of four percent, an economic result of EUR 293,280 is obtained on the basis of these assumptions, see Table 3. This corresponds to a result of EUR 1,275 per student. The result per student and year is EUR 42.

The results in Table 2 show that for profitability, wage development in the examined alternative, i.e. for pharmacists, must exceed wage development for the same individuals in the alternative case.

Table 2: Sensitivity of results to differences in wage development in the examined case and the alternative case

Alternative case	**Examined case**		
	1,5 %	**2,0 %**	**2,5 %**
1,5 %	-7,136,270	2,937,384	13,924,218
2,0 %	-17,114,191	-7,040,537	3,946,297
2,5 %	-28,017,532	-17,943,879	-6,957,044

On the basis of the results in Table 3 it is possible to conclude that, with the given assumptions the program is profitable already after the three planned admissions. A higher discount interest rate produces a negative result independently of the number of admissions. As shown in Table 2, if the program is to be profitable, it is also necessary that wage development is more favourable in the examined case than in the alternative case chosen for comparison.

Table 3: Compilation of the impact of discount interest and number of admissions on the results

i n	0,02	0,03	0,04	0,05	0,06
230 (3 admissions)	8,623,392	3,968,972	**293,280**	-2,619,041	-4,932,970
280 (4 admissions)	10,450,911	4,793,598	351,536	-3,146,735	-5,908,374
330 (5 admissions)	12,439,842	5,781,846	585,773	-3,480,321	-6,668,653
380 (6 admissions)	14,404,708	6,748,704	811,000	-3,805,275	-7,400,267
430 (7 admissions)	16,345,407	7,694,512	1,027,564	-4,121,730	-8,104,287
480 (8 admissions)	18,261,859	8,619,607	1,235,799	-4,429,821	-8,781,741

4.2 Regional perspective

An analysis from a regional perspective must take into account the students' choice of residency after completing the program. The proportion moving effects revenues in the analysis. If a student moves from the region, the region in which the program was offered has had to pay for most of the costs while revenue in the form of increased production goes to the region the student moves to. Revenue is also influenced by the fact that study subsidies which the students receive are seen as revenue for the region since they are financed with state funds. When it comes to costs, the regional analysis bases itself on who is financing the costs. This means that entries financed with state funds may be excluded from the analysis, see Table 1.

4.2.1 Results and sensitivity analysis

If the program receives three admissions with 230 students in all and the discount interest rate is four percent, and if all the students that complete the program remain in the region, a positive regional economic result is obtained from the assumptions equal to EUR 9,154,869. This equals a result of EUR 39,804 per student. The results per student and year are EUR 1,327. Table 4 shows that the regional economic results become negative first when only 10 percent of the students stay in the region, which equals 23 students.

The sensitivity analysis for the discount interest shows that the program is profitable at all discount interest rates aside from the case if only 10 percent of the students stay combined with a discount interest rate of five and six percent.

Table 4: The sensitivity of the results to the inclination to move

Proportion remaining in percent	Results
100	9,154,869
80	7,099,814
60	8,044,760
40	2,989,705
20	934,651
10	-92,876

On the basis of these assumptions, the Pharmaceutical Science Program in Umeå is profitable at the regional economic level. Profitability is independent of the number of admissions to the program. Similarly, the discount interest rate chosen does not effect whether or not the program is profitable. The results are also relatively independent of the proportion of students who choose to work in the region. A combination of a discount interest rate over four percent and a proportion moving of 90 percent does however present a negative regional economic result.

5. Summary

The results show that, with the given assumptions the Pharmaceutical Science Program at Umeå University is profitable both from a national and a regional perspective.

From a national perspective, the results are influenced by the discount interest rate so that discount interest rates exceeding four percent generate negative results. Profitability is also dependent on the wage development of those who complete the program being more advantageous than if they had not completed the program.

From a regional perspective, this educational venture's profitability is relatively insensitive to the choice of discount interest rate and proportion moving. Only discount interest rates over four percent in combination with a proportion moving of 90 percent generate negative regional economic results.

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EDUCATIONAL MARKET OF SAXONY – SYSTEM AND PROCESS MODELLING AND OPTIMISATION FOR A BETTER ACCESS TO EDUCATIONAL OFFERS AND KNOWLEDGE

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The Relation of Global and Regional Educational Markets

The recent development of the commerce is characterised by the relation of global activities for regional markets. The increase of individual demands will be satisfied by using the enormous opportunities of services and offers which are world wide available. But the individual requests of the consumers due to the regional peculiarity determine the regional behaviour for offering and selling services. That is why an increasing diversification of the markets is the result of the dialectics of globalisation and individualisation. This statement is appropriate for the development of the educational markets, too. Especially the further education was influenced by the change from the public dominated services to more private market activities for educational offers in Europe and Germany in the last decades. But because of the aspect of lifelong learning with regard of the rapid development of the knowledge an its influence of professions and employment the public educational sector, especially the universities, started to exploit the further education as one of the strategic fields for their growth in the future, too (1). The result is, besides the mentioned diversification of the market, a growing number of players in the markets coming from the public as well as private sector and offering a growing number of educational services. At first sight a pure advantage of more chances for better individual learning and training by a growing number of different offers is generated by free impact of the market players. Indeed the chance to get the right services for the individual educational demands becomes better and better, but the new problem is to find the right offer. Therefore the authorities and market players have to work towards a large extent of market transparency. It will be able to be generated by market information transparency supporting the free competition. The same objectives are pursued by developing a regional educational e-market as part of the global educational market using the advantages of web services and communication by the market community (2).

General Concept of a Regional Educational e-Market (REM)

The main objective for a REM is to improve the regional networking in education. On the one hand the interested persons, learners as consumers, are looking for the right individual offer for learning and training, on the other hand the educational provider try to find interested person using their offers. Such kinds of traditional markets existed already in the past, but there are new chances for improving the relations between learners and providers by the using the new forms of electronic communication especially the web based communication. This means the modern REM should dispose of information, communication, and transfer platform for the learners and the providers as the access layer for initiating and managing the partners' relationship. Therefore it has to have a data base system as data storage layer in which the providers are able to input the relevant information concerning the provider itself, the products and services as well as additional hinds and remarks of the branch. The access to the data base will be realised by a functional layer. This layer offers the main functions for linking the access and the data base layer by using the web services of the preferred access by internet, extranet, or intranet. So the REM enables the learners to investigate in the data base simply and effectively whether one of the providers has the right program for the desired, individual training. It provides the overview of the regional educational market and helps to find the appropriate offer in the region.

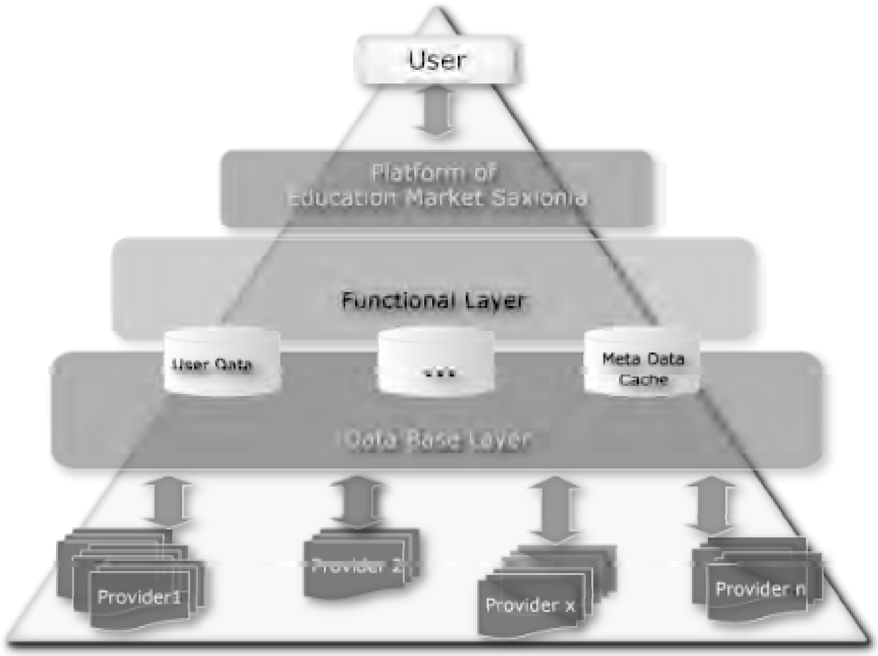

Figure 1. General Concept of a REM (7)

Besides the basic functionality further services could be provided by the functional layer. There are two very interesting concepts completing the functional services: the supplemental services and the client services. The supplemental services are add on functions including additional information and tools for the user such as educational consulting tools, news services, check lists, analysing tools, etc. The main focus is to adapt the educational services to the user's requirements and to support the activities of the providers. The client service involves the concept to copy and mirror the whole functionality of the web based platform system of the REM for one or several clients. The clients are providers interested to apply the existing platform for their own web based educational market place as client. For that:

- the basic functionality and, if desired, parts of the supplemental services are mirrored;
- the client sub data base is implemented;
- the graphical user interface is adapted to the corporate design of the client's organisation.

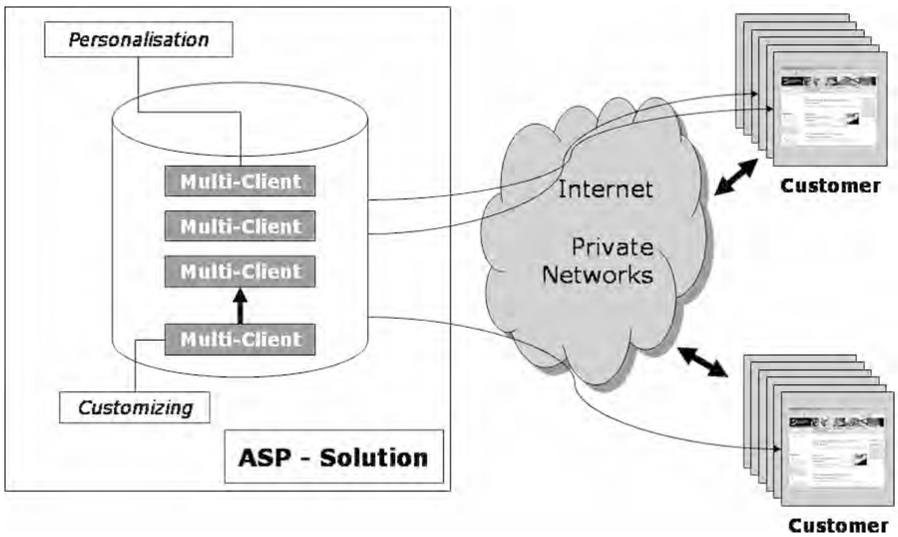

Figure 2. The client service concept of the REM (4)

The client service is related to the application service provider concept implying the supply of software applications and computer services based on lending and renting procedures.

System and Process Development and Optimisation

The REM of Saxony in Middle Germany was designed for constructing an internet portal mirroring the educational branch in Saxony and supports the inhabitants in searching and finding the right educational program on a fast and simple way. Because of its public character and the large target groups it is promoted by the public services as well the private organisations in Saxony. But the REM will be part of the trans-regional educational information systems, too. A general process model is necessary for such a demand. Three main process subsystems are typical for the REM:

- the access of the interested persons to the portal;
- the access of the providers to the platform;
- the internal organisation of the services of the market place.

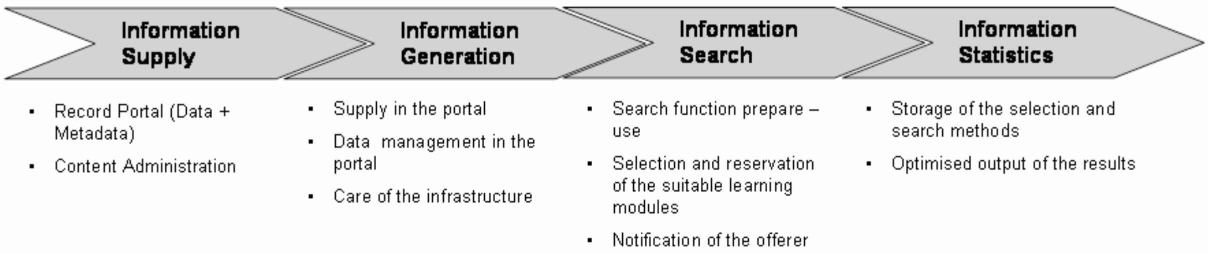

Figure 3. Rough Model of the general processes of the market place (3)

For each subsystem of the rough description a detailed process model was developed by using the prevailed method of the event controlled process chains.

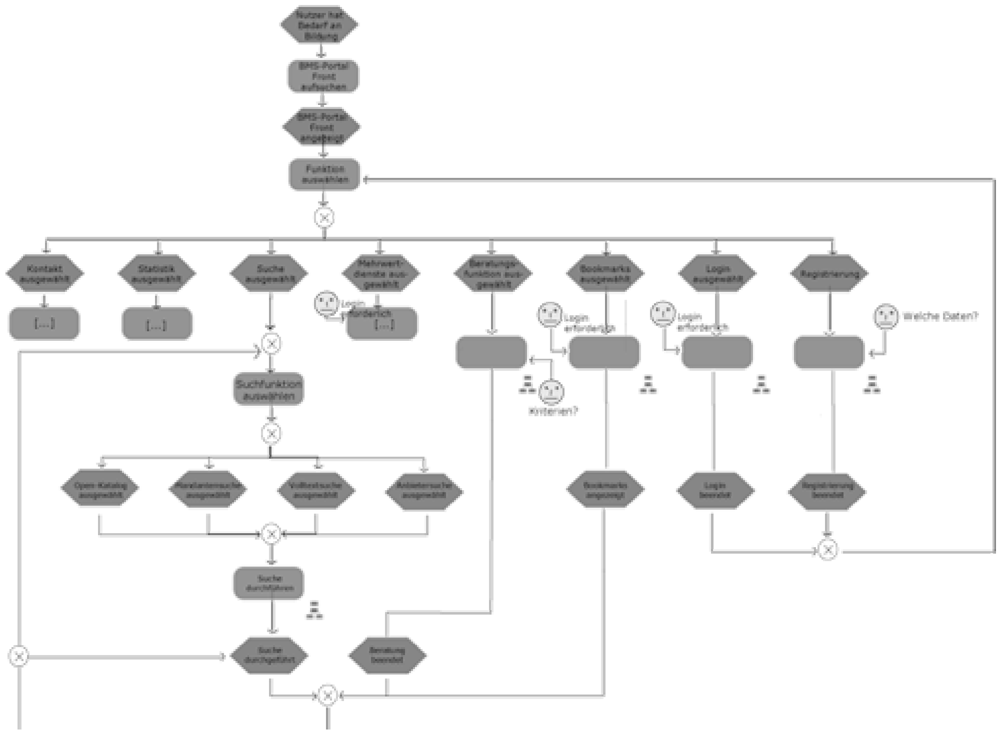

Figure 4. Excerpt of the sub chain “user access to the market place”

The process modelling was so essential because of:

- the need as discussion and information platform for the developer and user team work;
- the optimisation of the rough and detailed procedures for the final solution;
- the derivation of the process supporting functions;
- the documentation of the basic processes and functions as the explanation assistance.

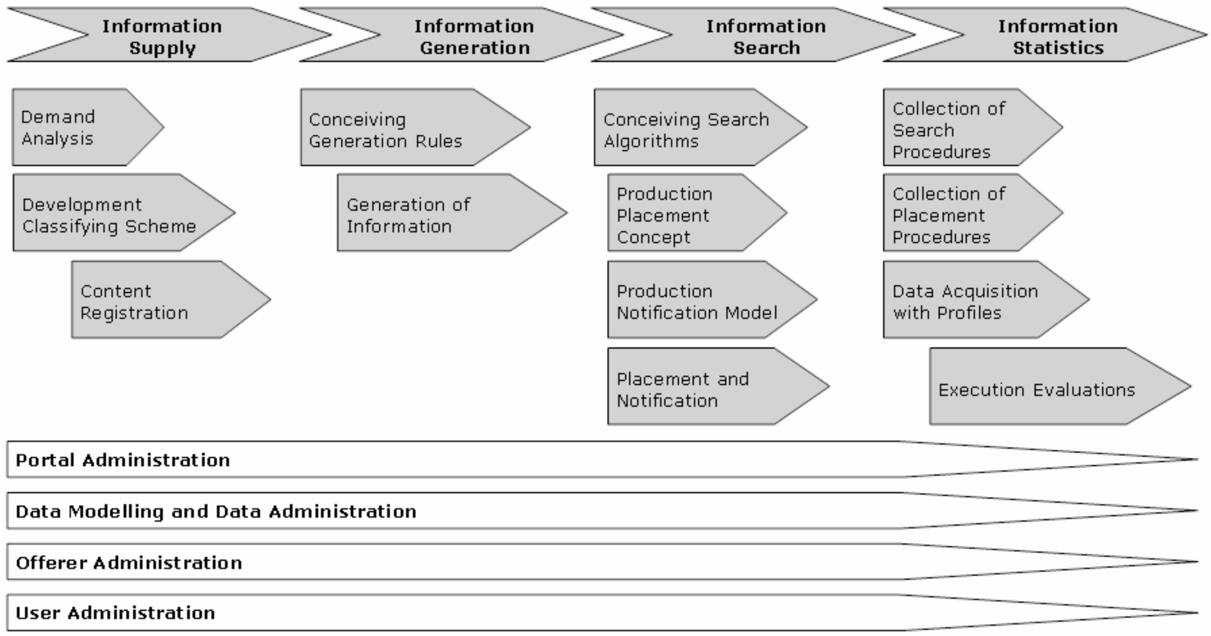

Figure 5. General Process Model of the REM (3)

The service and infrastructure processes and functions are derived from the description of the core processes and functions.

Information and Knowledge Transfer based on Business Model

The REM is the basis for the information exchange and knowledge transfer between learners as customers and the providers as seller concerning the educational offers which are available in the region. The interested person should be able to search and find the right educational offer in the REM of Saxony or in a trans-regional educational portal by getting the pre-filtered and comparable information from the educational information system. Therefore the REM should provide:

- the special search engine and functions;
- the comparison of several similar educational offers;
- the support by the checklist assistant system;
- the consulting function;
- the 24 hour availability.

The provider should be able to organise and present its educational offers in the REM of Saxony linked with trans-regional educational networks by managing the educational information and administrate the access of the interested person to its offers. Therefore the REM should support:

- the market access of regional and trans-regional educational providers;
- the development of the networkability of the regional educational providers;
- the sustainability of the application of educational projects such as content development;
- the overview of the regional educational market;
- the feedback describing the attractiveness and assessment of the own educational offers.

These objectives of the users and the providers are the background for the development of their business relations specified in the business model for the REM. Three types of business models were defined for educational content and service providers: integration model, publisher model, and catalogue model.

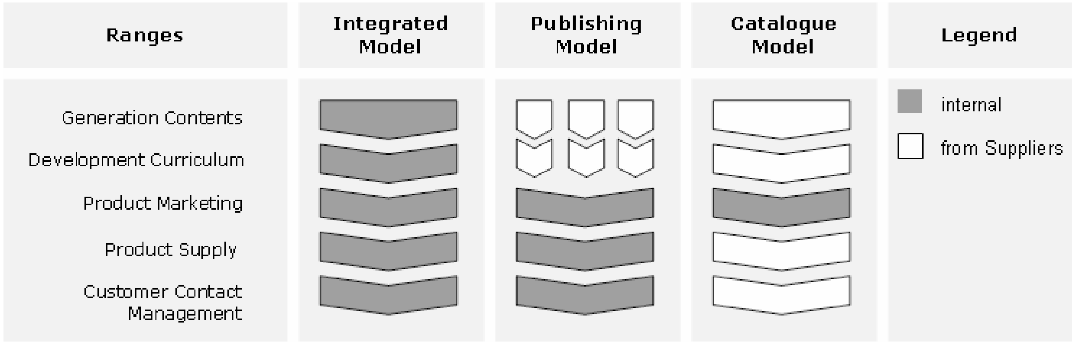

Figure 6. Basic Types of Business Models (3)

The preferred model for the REM of Saxony was the catalogue, because of focusing the REM on the information transfer by an educational information system as a public service mission.

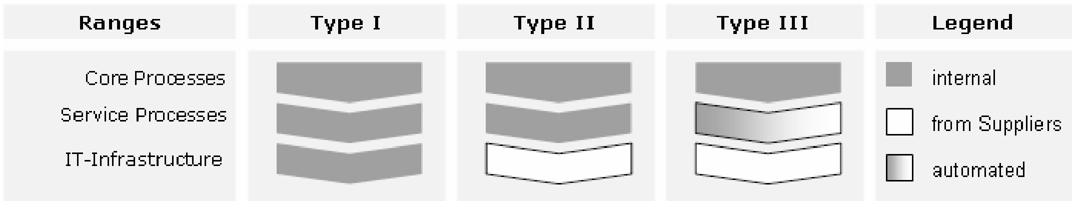

Figure 7. Modified Types of the Catalogue Model

The user and the client are able to decide which type of the catalogue model will be applied. A three layer concept was selected and adapted to the catalogue model for the REM including managing, operational, and administrative level of the organisation.

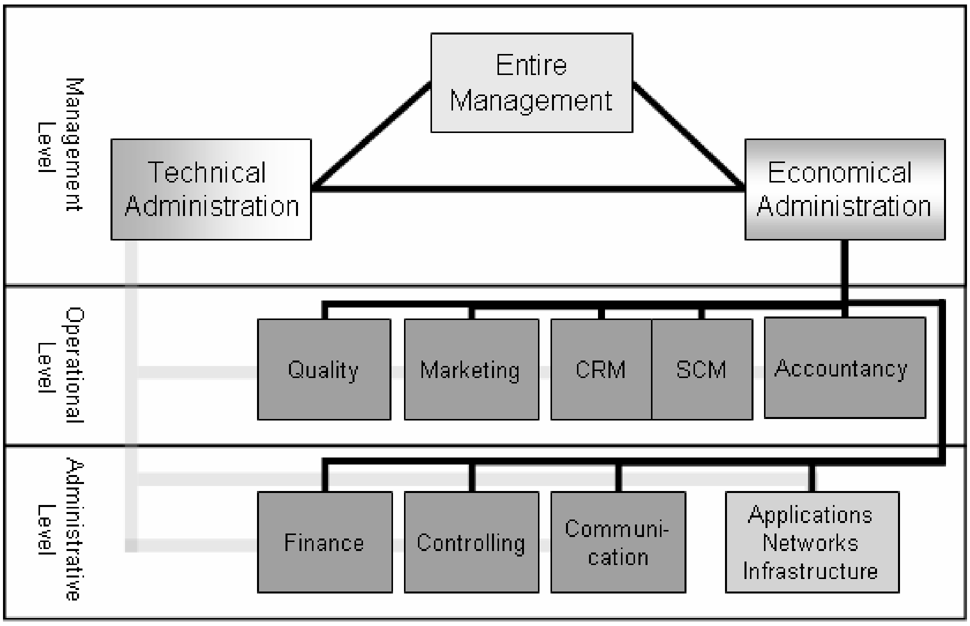

Figure 8. Organisation Chart of the Catalogue Model (11)

The business model allows joining the developing and application partners of the REM due to the public welfare, combining public, non-profit as well as private interests. The general use is non-profit based. The development and implementation is supported by a consortium of contractors. The pilot operation will be done by non-profit organisations as business operators. The REM of Saxony is a self-sufficient system including standard data export and import interfaces for the support of the data transfer with other educational data bases and based on a special quality management concept.

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DISTANCE LEARNING AND PROBLEMS OF ENSURING ITS INFORMATION SECURITY

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1. Introduction

Distance Learning (DL), based on interactive educating technologies, is an integral part of the modern educational process. At present problems of development, integration and maintenance of systems supporting DL became highly urgent for many educational institutions (EIs). DL provides schools, universities and other tertiary EIs with appropriate means to share educational resources to fill the much-varied educational needs of their students and country. That approach enables EIs to facilitate support for equal access to educational opportunities for all citizens regardless of their geographic location or socio-economic circumstances whilst increasing both the delivery of high-quality educational services and the reach of such services to more and more people with significant results, decreasing overall operational costs, less fiscal funding and higher returns.

Education today is faced with supporting a broader variety of communications among a wider range of customers even as it seeks to reduce the cost of these communications' infrastructure. DL trainees are looking to access the resources of their DL systems (DLSs) as they take to the road, telecommute or dial in from customer sites. At the same time, past solutions to wide-area networking between the DLS and its users, such as dedicated leased lines or frame-relay circuits, do not provide the flexibility required for quickly creating new educational resources and links or supporting team work in the field.

In DL world current trends far surpass simply putting manuals, knowledge bases and instructional documentation online. It is, instead, a matter of offering high value-added instructional services and educational resources to the students of all ages, from all over the world. Professors are implicated at all stages not only as teachers, but also because these technologies help them to keep their own knowledge up-to-date throughout their professional lives. Thus the main areas of modern DL improvement activities assume an effective support of the following:

- interactive devices and tools for DL;
- high-bandwidth multimedia instructional resources;
- high-quality, high-definition videoconferencing systems;
- decentralized learning communities.

2. DLS Vulnerabilities

An interactive DLS is usually composed of the following components:

- fund of educational courses;
- DL management modules;
- progress testing subsystem;
- databases and database management systems;
- Web server and Internet applications (for DL users' communication);
- tools for the interactive DLS components development and support.

Modern DLSs come with the integrated network (Internet/Intranet) education course delivery application, network or wireless access, some servers (Web, mail, ftp, etc), routers, network security tools, backup system and local protected file storage and, using clustered services, can scale from the smallest to the largest educational system. The UPS system provides DLS protection from power outages and power surges. Open operating systems ensure fast integration and compatibility in any network environment. Optional software includes grade management and private online assignment and project posting software, messaging and practice directory services. Recommended optional services include installation and help desk support.

Every educational institution using various DLSs should be constantly vigilant about security of all their information and network resources. The DLS consists of collections of information and educational environment, methods and educating facilities, identification checking tools, analytical, financial, economic, marketing, legal and control structures, etc. While analyzing the DLS components it is necessary to note the following [1]:

- methodological and theoretical developments, information resources, author's courses, textbooks, manuals, scholastic allowances and other learning and methodological material require protection to secure commercial secret and copyright observance and rights on intellectual property;
- electronic education facilities (learning electronic publishing, computer-based education systems) need protection against an unauthorized copying, modification and usage regardless of implementation technologies – "case" or network;
- protection of trainees' and staff personal information is needed (confidentiality requirement);
- official data of management system, financial and analytical structures need protection against unauthorized interference (confidentiality and integrity requirements);
- information transferred by means of computer and telecommunication networks should be protected from "sniffing" and modification (confidentiality and integrity requirements);
- it is necessary to ensure permanent DLS functioning and to protect it from "denial of service" attacks (availability and non-repudiation requirements);
- it is necessary to take measures on verifying examined personality and securing his/her testing results integrity for the purpose of implementing remote on-line progress testing (we mean that students should be authenticated and the results of their progress testing should be protected) (integrity requirement).

Checking a quality of a trainee's knowledge being accumulated is a key education system aspect regardless of the way of its operation (traditional or distance). A methodologically competently developed progress testing subsystem gives an objective idea about functional and economic correspondence of the whole education system. It is reasonable in some cases (for example during intermediate semester progress testing) to replace face-to-face examination (50 or more one-year students within one or two hours simultaneously) by remote testing with the help of an interactive DLS without the quality loss at least partly unless at all. Such a decision is more efficient both with economic and organizing viewpoints. The way that could guarantee an identical performing the requirements of remote progress testing subsystem is its safety ensuring.

DLS Web server is usually a part interfacing the internal DLS resources and the Internet (or Intranet). Access to any DLS via the Internet allows using all advantages of this global network: its availability, independence from the platform, nationwide etc. However a Web server is vulnerable from standpoint of ensuring DLS information security. Usually it is located outside a local-area network and it's protected Demilitarized Zone (before a firewall or a proxy). Thereby, ensuring Web server security is based on its own services, operating system and network equipment. For setting a Web server it is recommended to choose well-proved software such as Apache, WN, IIS, Netscape and others. A specialist should execute its installation, configuration and support in any cases. Different security strategies are available for implementation for listed above software types. Qualified configuration of the servers allows organizing efficient protection against many well known attacks. Besides WN, IIS, Netscape support the SSL/TLS protocol. Use of a 40-bit key will reduce "sniffing", while use of a 128-bit key will permit strong communications protection. And of course software errors discovered in the Web servers should be eliminated by installing corresponding patches issued in due time.

CGI scripts usage for the Web servers is the next DLS vulnerability. All CGI scripts should be carefully tested on safety, as many of them kept program errors, which can become the loopholes for malicious persons. Java and JavaScript usage is one more problem of ensuring DLS security. Unlike CGI scripts, Java applet is run on a client side and that is why it cannot damage Web server, but can cause troubles to a client. Ensuring Java and JavaScript secure usage is based on a Web browser used by a client. Problems of Java and JavaScript secure usage appear as a result of the errors in Java interpreters used by the browsers. Browser suppliers trace and correct operatively software errors discovered by issuing corresponding patches. DLS trainee should install them and update his/her browser in due time. It is necessary to a DLS developer to conduct a careful testing of applets and scripts used in all modern browsers. Up to the testing results the developer should recommend the DLS users browser versions advisable to use or not.

The intellectual property associated with the educational courses is of particular value in the DLS itself and it should be protected against an unauthorized copying and usage. For that purpose it is possible to print a warning on the ownership/copyright for any distance learning course as well as reminder of legal and criminal responsibility for violating of the specified rights in accordance with the country laws and the international agreements. In some cases it may be useful to protect screen pages against copying via the exchange buffer and printed output. It is also necessary to stipulate protection against using the programs of site copying on a client computer such as Teleport Pro, Reget etc.

Any DLS accumulates and stores a big volume of information, which is possible to present dynamically in the structured form (for instance, information about trainees, teachers, courses and relationships between them). Optimum information vault for that purpose is a database using “client-server” technology. The best known from existing databases are Oracle, Microsoft SQL Server, Informix etc. It is possible to get access to all of them using applets and scripts applicable on the Web sites. Corresponding database server service ensures security of information stored in the database. Except standard security tools as “good” passwords and delimitation of user rights to the database server, a DLS developer should take care of each DLS user, gaining database access with his/her account and definite rights.

While designing any DLS it is necessary to apply the most tested development tools, avoiding usage of unverified or untested libraries of scripts, patterns etc. A designer should find a compromise between the newest and the most tested versions of development environment.

Among DLS components there are utilities allowing simplifying management procedures for database and Web server to create new courses etc. All DLS utilities should be carefully tested and should not create problems with security to both the DLS as a whole and its separate components.

At the DLS designing it is necessary to take into account that system users have computers with different hardware platforms and operating systems. It is very important to pay special attention to testing of the client DLS software running on the different platforms.

At the DLS security subsystem development it is necessary to minimize essentially a volume of information downloaded to a trainee’s computer (including applets and scripts supporting security). Low speed of information exchange between the DLS client and Web server should be taken into account. That is why it should be recommended not to overload Web page by spare applets and scripts.

Monitoring tools used for analysing all interactions with the DLS Web server should be also stipulated.

Short analysis of the DLS components has marked safety problems facing a developer of an interactive education environment. That is why we come to a conclusion that information protection is required for the DLS and so we are looking for more sophistication in its security, moving beyond firewalls and blanket restrictions to authenticating users for access to specific services and applications or for billing purposes. As far as the majority of the DLS components require safety assurance, it is reasonable to consider well known effective information protection strategies and to realize a complex approach to their implementation: to develop the information protection subsystem as an integral part of the DLS.

3. Ways of the DLS Security Ensuring

Absence on the software market of the standard built-in protection modules that could be used for the interactive DLS securing leaves a DLS developer three choices:

1. Having shown pretty share of altruism, to make the DLS open (free of charge). Such an approach supposes to forget information protection problems together with system cost-efficiency. The approach does not interesting from the security viewpoint.
2. To develop the DLS without any protection and then try to secure it applying all available means, for example to dispose some standard protection tools for software used during the DLS operation or to develop a build-on protection subsystem corresponding to specific DLS security requirements on one's own account or accepting an offer of outside specialists.
3. To design and implement the secure DLS as a whole complex with the build-in information protection subsystem (IPS) meeting security requirements taken into account from the outset. So the security design and functional design are complementary.

Built-on information protection subsystem

This approach is invariant if it is required to protect already operating DLS. However it has some essential disadvantages:

- the build-on IPS for the existing DLS is harder to develop since we are imposed to adjust in all to the DLS developer's decisions, who did not take into account the possibility of the IPS presence;
- to detect DLS vulnerabilities and to eliminate holes in protection is harder than to design a complex strategy of a whole DLS protection;
- the principle of protection continuity implying taking the corresponding measures on information security in the DLS on all stages of its life cycle [1] is broken;
- the IPS requires additional system resources for its operation;
- the built-on IPS is more expensive than similar build-in IPS developed simultaneously with the DLS.

Thus follows a conclusion that the built-on IPS is non-optimal for security insurance and from viewpoint of sharing the system resources. It is labour-intensive, bulky and requires additional expenses.

Complex DLS development with an information protection subsystem inside

If the decision on the DLS designing is accepted and the ensurrance of its protection is planned from the beginning of the project development, it is reasonable to implement the complex DLS with the build-in IPS simultaneously. Such an approach allows to take into account security requirements at the stage of designing and to ensure the efficient, holistic and complex secure DLS.

It is possible to list the main requirements to a secure DLS:

- A comprehensive *DLS management architecture with centralized control over security policies definition and DLS network configuration*. All DLS software should be installed and configured with the least privileges principle. All software packages that are not necessary for the DLS operation should be removed from the DLS servers. An analysis of configuration parameters and their default values for used software (including OS and Web server) should be conducted to determine their influence on security.
- *Intelligent client software and programmable network gateways* that maximize network visibility by reporting status and tracking all DLS users' activities. All DLS user actions must be logged. While interacting with the DLS Web interface the user should not see any interface controls (links, buttons, etc.) performing actions that are not authorized by user's privileges. The user registry stores user accounts holding information about access control to different DLS functions. Access to all DLS resources requires the process of authentication and

authorization with every Web request. Only the DLS administrators should have access to DLS database management functions. After administrator defined period of inactivity the user session should be closed, etc.

- *Total network availability* from remote user's access points to central DLS network connection.
- *Lowest cost of ownership* by ensuring low-cost connections while simplifying network administration and support.

4. DLS Information Protection Subsystem

DLS IPS solves the following tasks:

- protection of DLS resources against unauthorized installation, copying, modification and usage; ensuring their integrity, identity and availability;
- authority of personnel auditing system operation;
- authority of teachers and trainees in the process of their interaction;
- delimitation of access rights to DLS resources to the authorized users, based on division of subjects and objects according to their privileges, groups, categories, themes, etc.

At implementing IPS it is necessary to take into consideration the particularities of information transfer media on which the DLS (telecommunications, local-area, wide-area, campus networks, protocols, standards) is based. It is possible to recommend the following methods for deciding the listed tasks:

- identification and authentication of the DLS subjects using passwords and in the most important cases (for example for the DLS administrators) using technical authentication tools;
- using the cryptographic algorithms for the encryption of confidential data (testing results, official data, personal trainees' and teachers' data, etc.);
- ensuring identity and copyright fixation by means of the digital signatures;
- using the monitoring and auditing tools.

The secure DLS is more expensive than its unsecured analogues. However during operation such systems allow to reduce expenses by means of full or partial rejection of face-to-face exams, relieve teacher's work on course and tests' improvement and spare trainee's time.

Main recommendations for the DLS securing protection methods are listed below.

- *Trainees' identification and authentication.* A client identification and authentication should be produced at the beginning of the DL and progress testing processes. Identification and authentication procedures should not bring system security violation.
- *Using the cryptographic algorithms* for privacy protection of the test tasks. It is necessary to use the cryptographic algorithms for data transferred between the DLS client and server during testing. An example of such type of protection is the SSL/TLS protocol intended for the transmission of commercial or private information via the open Internet/Intranet channels.
- Using the *digital signatures* for signing by the teacher of the testing reports and for ensuring integrity of conditions and testing results. In the cases when it is necessary to validate the authorship of an information sender the digital signatures should be used (for instance during e-mail consultations, essay assignment and online conferences, etc.).
- Ensuring the *protected processes on a user computer.* Question answering time restriction is broadly used in the progress testing subsystems. The protection module of the DLS progress testing subsystem should ensure invariance of answering time with respect to the actions of the concrete users (changing a time for the computer, etc.).
- Using the *audit and monitoring tools* for system state analysis. It is expedient to write and read the system log files for timely reactions on the dangerous situations and events.

- Using the *access restriction tools.* This ensures protection of testing results' database against any modifications.
- *Additional security measures.* It is possible to implement an access to the next (previous) course screen page or test, not by the direct URL, but by means of an applet (script) as an additional security measure. This measure allows hiding a real location of the DLS information resource and denies the return to the previous test question with the purpose of correcting the answer. It is also possible to foresee usage of public terminals by the trainees (using expire page views). Additionally it is possible to propose an obligatory identification/authentication procedure when transferring between course sections during intermediate progress testing, etc.
- Building *Virtual Private Networks* (VPNs) [2] for information sharing between the EIs, the Ministry of Education and the trainees. The DLS VPN provides an easy way for accessing licensed DLS resources. Most VPNs include encryption, strong authentication of remote authorized users or hosts and mechanisms for hiding or masking information about the DLS topology from potential attackers coming both from outside (the public networks) and from inside (the EI Intranets). The authorized users are responsible for posting the appropriate information to the DLS and accessing the DLS to obtain information, which other authorized users have posted. To help ensuring confidentiality of the information provided by the DLS, the DLS should be password protected.
- *DLS security policies* should be stated. Without them any EI has no general security framework.

The given list marks only guidelines for perfecting the DLS security. It does not express completeness and can be extended depending on the specifics of the DLS used.

5. Conclusion

Motivation of expediency of the information protection methods and tools at an interactive DLS designing is presented. The ways for the DLS security providing are shown and analysed. Specific features of the DLS functioning via the Internet are emphasized. Functional components of such DLS and marked problems concerning its information protection are considered. The weakest points of the DLS components are pointed out and some brief recommendations for their protection are given. Possible tools for the secure DLS designing are listed. Complex approach to deciding named problems means developing build-in information protection subsystem as an important component of the DLS.

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DESIGN AND ANALYSIS OF STRATEGIES FOR THE MIGRATION FROM PROPRIETARY SYSTEMS FOR UNIVERSITY E-LEARNING TO CONTENT-SHARING SYSTEMS

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Introduction

The Web is nowadays a suitable channel for learning for its characteristics:

- Connects most of the instructional knowledge producers (Universities, Research Centers, etc.) from the developed countries. Talking about Universities, it is one of the most (if not the most) used channel for sharing knowledge between them.
- Connects, on the other hand, most of potential learners. These learners are very familiarized with Internet if they are still in the University or they have left it not long ago.
- The use of the web is increasing as the bandwidth is widening and the prices are going down. In the USA, as example, the ratio students per computer connected to the Web has gone from 20 students per connection in 1998 to 5.6 in 2002 [1]. This tendency can be extrapolated to Europe.

For these reasons, the creation of learning contents for the Web is increasing, especially inside the Universities, always avid for investigating new trends. But most of the e-learning courses have started from a scratch, and they have not been able to be reused for generating new courses for different Universities. This waste of sources is decreasing as the Universities are getting more experience from the e-learning field.

The cost of creating new contents happens to be quite high. From the experience of the Continuing Education Centre of the Technical University of Valencia, if you want to produce quality contents, the costs related are about 10 hours of work from the expert for each hour for the student, and we have to add also time from Software engineers, designers and pedagogic experts.

One of the reasons why this cost is so high is because the e-learning gives little space for improvisation for the teacher, and this forces the contents to be well defined and structured.

This makes that the costs of production of a course could not be paid back only with one or two editions, and that reusability becomes one of the principal goals in e-learning, not only inside one institutions, but also between institutions.

Aspects of reusability

To achieve real reusability, especially in Europe, we must overcome some that we can group in four groups:

- Cultural aspects. One of the results of a Benchmarking done in the SEFI (European Society for the Formation of Engineers) Working Group of Continuing Education Seminar in 2000 [2], was the importance of the cultural aspects. USA is a region with a common language and culture, but talking about Europe, it has quite a big cultural and linguistic richness to be taken in account when designing our systems. These cultural aspects are important not only in the content creation phase, but also in the delivery phase.

- Economic aspects. Universities have nowadays big quantities of contents already created, and they are incompatible among them. It sounds quite sensible to design strategies that allow the use of these previous efforts done by experts, so we could take profit of contents already generated, to export these units to other universities and to import units from other universities.
- Pedagogic aspects. Reusability of contents should not create "Frankensteins" courses with parts from different content providers. A pedagogic review of the aggregation of contents from different sources seems to be quite wise, and some of them will need some changes in order to make the course coherent.
- Technological aspects. The technology used must face the previous aspects, providing tools for solving the problems from the other three aspects. To make the system capable to share contents, it should also (at least) be able to translate contents from and to one standard for interchange, although it would be better if it uses this standard internally for content creation and delivery. The usability of the system is also a basic item, because the e-Learning content creation and delivery should be done by experts and designers, and not by software engineers.

Standards for reusability: SCORM

There are some efforts to achieve this reusability, as the efforts done by ARIADNE (Alliance of Remote Instructional Authoring and Distribution Networks for Europe) [3], but it is the United States who is setting the facto standards through ADL (Advanced Distributed Learning), a consortia with the task ordered by the Department of Defence of the USA (DoD) to create a reference model for e-Learning: SCORM (Sharable Content Object Reference Model) [4].

SCORM is based in an e-Learning architecture which divides completely production and delivery. The production is based in the creation of Sharable Content Objects (SCOs) and the content delivery is done through a Learning Management System (LMS). We can see that this architecture is conceived with reusability in mind.

It is quite clear that each SCO must be independent, not presenting any relation or reference to other SCO, in order to get the SCOs as "nuggets" to produce contents to be delivered.

The SCORM Model is divided in three submodels:

- Content Aggregation Model, which describes what is a Learning Experience (something similar to a course) and how to packet it, including the meta-data necessary for the LMS to do the delivery.
- Run-Time Environment Model, which describes who should communicate the LMS and the SCO while doing the delivery.
- Sequencing and Navigation Model, which deals with the description of how should a learner navigate through the Learning Experience and defines the concept of goals, that can be used as part of the Rules to indicate the path to the learner through the Learning Experience.

As an example, we can think about three Universities which produced SCO1, SCO2 and SCO3 respectively. Each University has produced its SCOs for their own courses but now they can "sell" them in order to cover costs. Then the third University has detected some demand from the market and decides to use its SCO3 and the SCOs from the other two Universities to deliver a course, using a LMS who can accept standard SCOs [Figure 1].

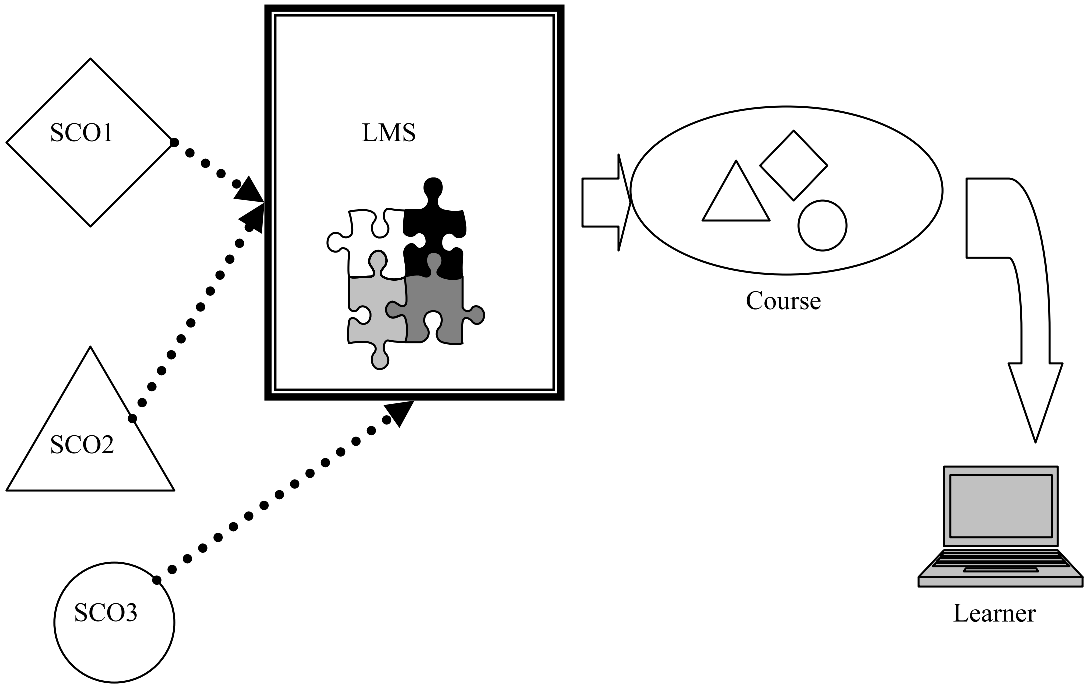

Figure 1. SCORM Architecture

Proposed strategy

Considering the aspects of reusability, migrating to some standard as SCORM is quite recommendable. On the other hand, having a big content repository and many experts adapted to a proprietary system prevents the migration to as simple as starting from zero and making brand new contents using the new standard.

Below you could see the proposed strategy, that we think it fit our Centre and many other Institutions in similar situations.

Phase 1. Choose the Standard

One Institution should be quite sure when he decides to change its e-Learning tools, train again their experts and tutors, invest in software or change it. For this reason, the standard should have these characteristics:

- *Accepted.* The Standard must be used by the majority of the market, or at least be seen as the future. Nowadays SCORM seems to be the Model which is appearing as the path to follow.
- *Reusable.* Reusability must be one of the main topics. As this is our goal, the standard should be ready for reusability, for publishing contents for other institutions to use them, and ready to "adapt" the contents to each situation easily. SCORM has "Sharable" as the basic idea.
- *Openness.* It is always better using a Reference Model rather than a proprietary model. This normally assures that you can change your contents to other vendors in case you find a better solution for your Organization. At this point SCORM is open in the model of interchanging, as it is only a Reference Model.
- *Flexibility.* Any technical solution must be flexible enough to allow different pedagogic approaches to be implemented. In this case, if we have contents already created, the new standard should support the contents we already have (at least the structure and logics). At this point we know that SCORM fits 90% to the structure and logic used in the e-Learning tools used by the Continuing Education Centre of the UPV.

In the case of our Centre (CFP-UPV), after detecting the necessity of reusability as a Critic Success Factor in 2002, we have been waiting for a standard mature enough to be chosen. At the end of 2004 we chose SCORM after studying it and when it included the “Sequence and Navigation Model”.

Phase 2. Export to the Standard

The first real step after choosing the standard is to prepare your author tool (the tool for the experts to create contents) ready to export to the Standard. This solution is only possible if your e-Learning solution has been developed in your Centre or if it was bought and the vendor gives now this service. We think that in the near future this feature will be a must-have for all the vendor solutions.

In our case, we have an internet author tool (BUDHA) which produces “Units”. These Units are inside courses, and they have a tree structure as seen in Figure 2. This structure comes from more than 6 years of experience and more than 3.000 students of e-Learning courses in the last year.

At the beginning the structure was intended to be unit-independent, i.e. each Unit should be self-contained. Each Unit follows normally the Kolb Model [5], but from the experience and feedback from experts an aggregation of 3 or 4 Units called “Competence-Course” is the real self-contained object. Each Competence-Course is not linked to any other Competence-Course and prepares to achieve one specific competence.

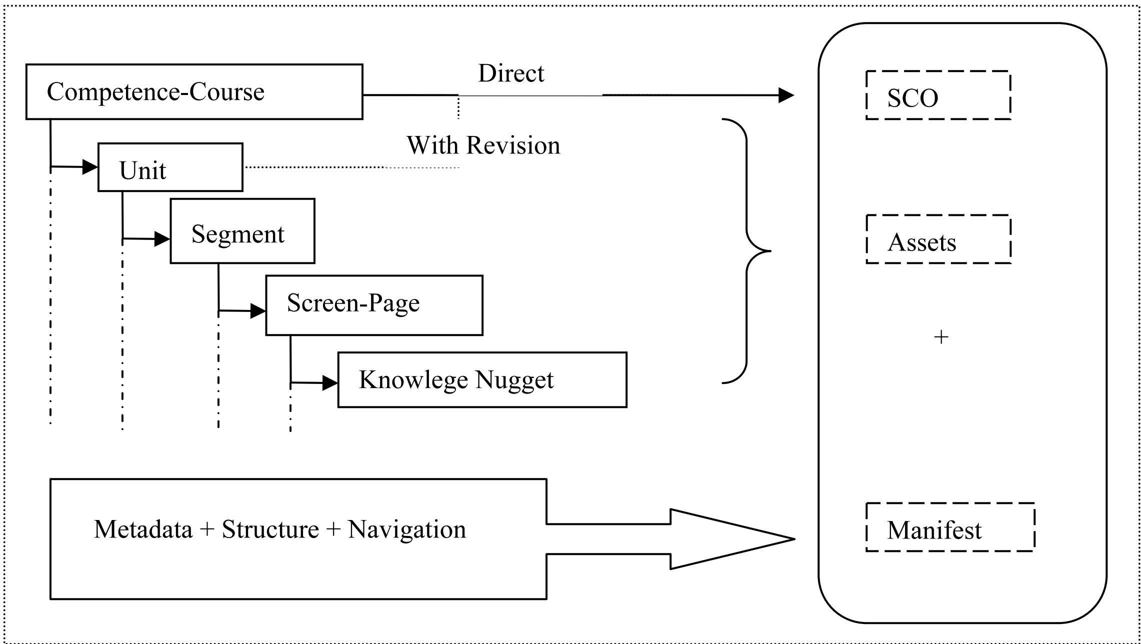

Figure 2. Content structure

But exporting contents is not only a technical question. You must assure that the SCO is independent from all the other SCOs. In our case makes that the export facility is direct when exporting a whole Competence-Course as a SCO but it needs some revision when exporting only Units.

Exporting the metadata (creating the Manifest in SCORM) in our case is one of the contemplated cases of SCORM: each Competence-Course fulfills one Competence (normally outside IEEE Standard) and the navigation is sequential between units (free inside the units you have already passed) and you have to pass one evaluation in some units to go on.

Phase 3. Import from the Standard

At this point a big change must be done. Your e-Learning delivery tool must be ready to accept SCOs not only with the same conceptual and pedagogic design, but with any possibility presented in the standard.

It is important to remind that importing SCOs is not only the technical data. It will need some revision in order to see if the SCOs are ready for the profile of student you have and for your purposes, and if the aggregation of SCOs is homogenic enough. If not, some “fixes” should be done.

At this point it is important to recommend that the SCOs contain little graphic design, in order to fit in any LMS with its own proprietary graphic design (imagine that each SCO has its own colours!). The flatter they are the better.

In our centre it is still unknown if we will convert our “Community” e-Learning tool in a more opened one, for accepting any SCO from any version, or if we will convert some existing open source tools (as Moodle [6] for example) to be integrated with our “Community” system. Probably at the beginning we will start with an integration of Moodle and if it we start to reuse from many different sources, we will adapt our “Community”.

Conclusions

In this paper we have seen the importance of reusability for the future, at least as a hygienic issue. Then we have presented a possible way of adapting one proprietary system towards reusability, and trying to minimize the costs in re-making the contents already produced and in training again the expert with new.

We must remark that the standards for reusability has nothing to do with pedagogic, whereas it is important to make a big stress in pedagogics when importing or exporting SCOs from/to different sources.

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THE COURSE HUB, VIRTUAL SCHOOL AND DIGITAL LEARNING RESOURCES

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Background

Multimedia and digital learning resources have the power to engage and inform learners but they are extremely expensive to produce. What we will focus on in this paper is the new possibilities concerning content exchange and the benefit in networking in the area of digital resources for supporting lifelong learning. Sharing and reuseability of digital learning resources are key factors when setting up services and internet databases for exchange of content. The Swedish agency for flexible learning and the National Board of Education in Finland have been networking concerning the exchange of digital learning materials and technics for making internet platforms interoperable. The National Board of Education supports the portal called the Virtual School and also the use of ICT and collects content and good practises produced as a result of projects funded by public authorities. Swedish Agency for Flexible Learning has set up and is running an open and free internet based service called: the Course hub.

1. The Course hub: Digital and flexible learning resources in a free and open database on the internet

The Course hub contains flexible course material for flexible learning. The services took place in the beginning of 2003 at the Swedish Agency for Flexible Learning. Key factors for the Course hub development are, searchable learning resources, interoperability between systems, using international standards for metadata, content packaging, collaboration with other hub initiatives, and besides the systems must be easy to use for teachers. The Corse hub has 1 400 users (in December 2004) and about 10 000 learning resources. The Course hub contains digital resourcers designed primarily for adult education or students from Upper secondary level of education. Learning resources are stored in a repository and teachers can compose their own material in the Course hub. In the online learning materials which are collected here along with functions as previews, reviews and assignments teachers are welcome to browse the collection or search for material. When registered as a user, you may add materials, comments and assignments to the Course hub. Usership is free. http://www.kursnavet.cfl.se

1.1 What will I see when I look at a digital learning material?

When you browse the collection or search for learning material, you will be able to go to a detail view of the material in the Course hub. This view tells you information about the learning material you have found. The learning material itself will be located in the Course hub or somewhere else on the internet. The Course hub only stores metadata or metadata and the materials. It also contains any peer reviews, user comments or assignments which instructors may have written to go with it. If you wish to see the learning material itself, simply click the link listed next to ‘Location’. The learning material detail view can be seen on Figure 1.

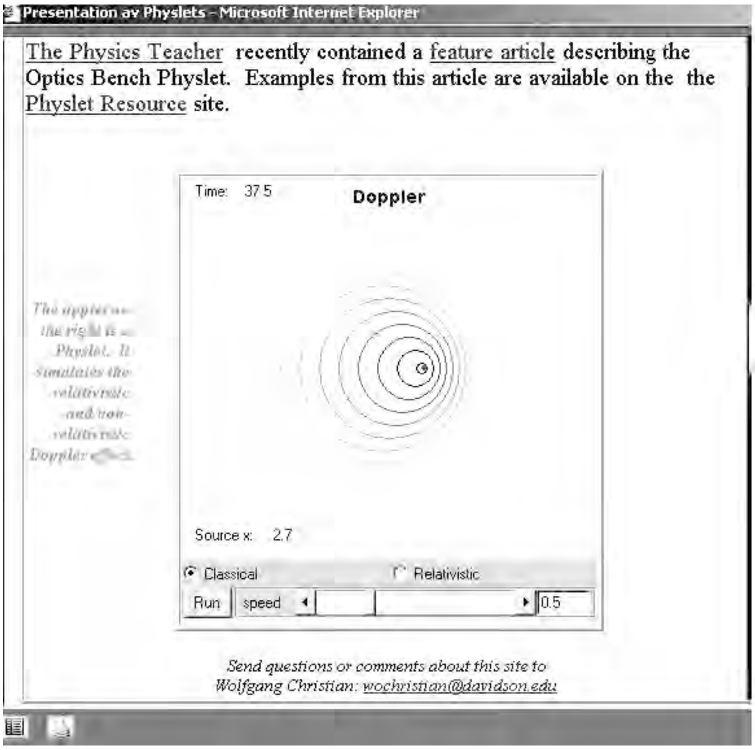

Figure 1. Picture, Content in the Course hub, Simulation – Doppler effect

1.2 What can I do with the materials I find in the Course hub?

If you find a material in the Course hub which you might want to use for yourself or in a class, all you need to do is download the metadata and the resource or add a link to the material to your course web page, or e-mail the URL to students or others who might use it.

You do not need to be a user of the Course hub to find or use any material listed in Course hub. If you use a material and want to add a review or an assignment to the Course hub listing, you will need to register as a user in the Course hub in order to post.

1.2.1 Go to the learning resource actual location http://www.kursnavet.cfl.se

Material is either stored in the Course hub or linked to as learning resources. Information about the material is stored in the metadata, along with the content or the URL (web page address) where the material is actually housed. The Swedish agency for flexible learning is responsible for the services but not for the content or upkeep of sites which are linked to the Course hub. However, we do try to keep links current. To go to a material, simply right click on the resource and prewiev the material's detail view.

1.2.2 Check for licensing regulations or costs involved with use

The material in the Course hub is freely available for use by anyone; but the services will, in the future, open up for others, having usage restrictions or costs. The Course hub does not impose or collect any regulations or fees associated with using a material. These are specified by the material's owner or creator.

1.2.3 Add a link to the material or email the URL to those who will use it

You can download material or copy and paste the URL from the material's detail view page, in order to use in your web page or an email.

1.3 Who provides the material to the Course hub?

Course hub material are added by teachers who have registered as a user to the Course hub. Any teacher may join the Course hub, and there is no cost or other obligation. Course hub users are usually teachers at adult and liberal education institutions or schools in Upper secondary level. So affiliation with an educational institution is required in order to join Course hub if you go to the register page.

Material may be added by those who created them, or by any user who find a great resource to share with others. When a material is added by someone other than its author or creator, an e-mail is sent to the person who owns it, to let them know it has been listed in Course hub. User comments and assignments may be contributed by any Course hub user for any material they have used. For more information about reviews you can go to the Course hub. User profiles are created and updated by each Course hub user. In the Course hub users can create modules of the user's contributions to the Course hub which the user can share or use in their own schools.

1.4 Who oversees and maintains the Course Hub?

Course hub is as a collaborative effort of a governmental and municipal organisations, but also support from liberal education.

Course hub supports is managed by the Swedish Agency for flexible learning Course hub administrative team. In order to find your support group, e-mail to: support.kursnavet@cfl.se

2. Virtual School in Finland

The Virtual school is funded by the National Board of Education in Finland and based on development projects undertaken jointly by various education providers. At general Upper secondary level there are web-based distance learning projects which lead to qualifications, such as the Upper Secondary Distance Education project. Web-based vocational education networks are using ICT to support learning in contact and in distance education, as well as to provide educational guidance for on-the-job-learning. The scope of web-based distance education ranges from sections of courses to complete modules.

2.1 Number of educational institutions participating in virtual school projects

In 2002 there were 237 virtual school projects funded by the National Board of Education in Finland comprising, 1 107 educational institutions. Funding for the projects totalled 2,9M EUR. In addition, the Upper secondary Distance Education project coordinated by the National Board of Education in Finland and funded by the ESF, involved 85 educational institutions.

2.2 Support for networks

The National Board of Education in Finland supports development of Virtual school networks through a state subsidy that schools apply for in January each year. Project funding consists of state subsidy and the education providers share.

2.3 Virtual School at your service

The aim is to make Virtual school services available to other educational institutions besides those already subsided thus giving everyone access to good practises and to provide them with opportunities to obtain new ideas for their own teaching model.

2.4 Portals

Maintained by the National Board of Education, the Virtual school portal www.edu.fi collects content and good practices as a result of projects funded by the National Board of Education and other public authorities. The portal also includes material that has been specifically produced by the National Board of Education in Finland in support of use of ICT in teaching. See webbsite: http://www.edu.fi/svenska/page.asp?path=499,540,1227,21200. In addition, Virtual school services and web-based learning resources are available from the Learning Gate of the YLE Finnish Broadcasting Company and from web-based learning material services provided by publishing companies.

2.5 Education provided by Virtual school

The Virtual school is one part of the multiform education provided by educational institutions in Finland. Student selection, certificates and other administration, management and services are provided by educational institutions. This enable students to study at Virtual schools alongside work and also to be registered at educational institutions. Co-operation between educational institutions enables virtual studies at several education institutions within one study programme. Links to the web pages of co-operation networks supported by the NBEF as well as details of the websites of educational institutions involved in the network, can be found at the NBEF website.

3. Build new knowledge with learning objects on the net

The learning objects discussion concerning ICT and web-based education is central these days.

Learning objects support teachers and educators with digital resources which support the practice of ICT in schools. In the handbook "Build new knowledge with learning objects on the net" written by Lissa Ilomäki from Helsinki University, teacher trainers and creators of learning objects can study the issue from different angles. The author represents new knowledge and research from both Helsinki University and Åbo University. The book can be ordered from bookshop with e-mail: myynti@oph.fi

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WELEARN.LAVISTA, OR HOW TO ILLUSTRATE THE CONCEPTS OF OBJECT ORIENTATION AND MODELLING TO NOVICES

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Introduction

E-Learning offers great opportunities to educators and learners. The involved gain more flexibility (due to self-organisation, the option to learn anytime and anywhere, etc.), new (teaching and learning) methods arise and learning/teaching material enriched with multimedia can help to give a better understanding of complex problems or concepts. One approach in this direction is the so-called WeLearn.LaVista course, which allows learners to "grasp" the concepts of object-orientation and modelling in computer science by means of explorative learning [8].

WeLearn.LaVista

One major research area at FIM (Institute for Information Processing and Microprocessor Technology) is e-Learning. Out of this focus the WeLearn.Framework was developed. The framework, which is constantly being enlarged in scope, consists of several components such as an open, easy-to-use e-Learning environment (WeLearn) of universal applicability; didactic models for use at universities, in schools and in adult education; various tools and courses (in particular to implement our ideas about introducing students to informatics) to enhance teaching in the final years of secondary education and at the university (more details can be found in [3], [5] and [6]).

A key element in realizing our ideas about introducing informatics consists of specially prepared teaching and learning material available to students both via the WeLearn platform and on CD/DVD. One corresponding course is called "Propaedeutic in Informatics". This course is the first one for informatics students at the Johannes Kepler University Linz. This course is held by FIM and regularly takes place in the winter semester; and involves blended learning [2] as a didactic model: here lectures and phases of self-organised study alternate. In the summer semester the subject matter is treated again. In this case the course consists of a kick-off meeting followed exclusively by distance learning, which better suits for working students, other latecomers and interested pupils in the final years of secondary education.

The electronic material [6] currently available comprises:

- A study guide: guidance for self-organised study and an explanation of parts of the subject matter, presented in the form of a dialogue between youngsters, and aimed particularly at pupils in the final years of secondary education.
- The entire study material in the form of illustrated, partly interactive HTML pages.
- The study material in full as text, also available as printed lecture notes.
- The full set of transparencies for individual lectures, aimed at first-semester informatics students in the winter semester.
- Self-assessment: exercises and a sample examination paper, to enable students to check how far they have got and which parts of the subject matter they need to go over in more depth.
- Study applets, on the basis of which students can carry out experiments and simulations and thus penetrate the subject matter – namely WeLearn.LaVista (which will be discussed in the following sections) are now also included here.

The experience of the last years showed that although the material was especially developed for e-Learning and also allows self-studying, more detailed information and an enhanced presentation was necessary in case of the concepts of object-orientation and modelling to guarantee a better understanding.

Project Idea

Object-oriented thinking is essential in computer science. Not only object-oriented programming is meant when talking about object-oriented thinking, but of course the modelling of a problem, abstraction, classification and therefore the creation of classes with attributes and methods are part of this concept.

The main goal of the project was not to demonstrate how object-oriented programming is done (for this many wonderful courses and tutorials already exist), but to give the learners an idea what object-oriented thinking is and to lead them systematically to the fundamentals in computer science. Therefore the material is not only destined to students, but should be part of the informatics education in schools. Ostensible this is important because object-oriented thinking (abstraction, modelling) is fundamental in computer science, but object-oriented modelling also encourages a more autonomous and self-managed behaviour. Not only unreflected adherence to instructions is supported, but the focus is on problem-oriented working and the ability to abstract possible solutions from well-known problems.

The learning and teaching material

To reach these goals, we decided on a combination of e-Learning/e-Coaching and new media (simulations and interactive animations) to visualise models, objects, etc. The idea within WeLearn.LaVista is to illustrate examples from everyday life, from which we then lead to models and objects that are specific in computer science.

Moreover, the idea was not only to have material that describes the concepts of object-oriented thinking and modelling, but to create material that allows experimenting with these concepts. Our experiences of other courses showed that “Hands-on Experience” and “Learning-By-Discovery” are of such a tremendous importance for the learners, that we did not want to ignore them. On the contrary, we have placed these methodologies in the foreground of the development of the course. Former case studies show that “Learning-By-Discovery” is always well-accepted and reported positively by learners ([2], [1], [7]). This may be because it allows the learners to find their own solution and gives them a feeling of success. Finally, this also increases the sustainability.

Object-oriented thinking and its visualisation

To illustrate OO-thinking a “modelling workbench” (based on JAVA) was implemented. This applet demonstrates objects (in terms of computer science), classes, class hierarchies, inheritance, methods, etc. from differing abstraction levels. Educators (in guided mode) or learners (while learning self-paced [4]) can switch between various domains to illustrate or to comprehend the connections of these concepts.

To get an idea of the before-mentioned concepts it is not important which domain (area of interest; problem world) is chosen – the concepts naturally stay the same. Nevertheless, multiple domains are implemented, to give learners the possibility to start from the best known environment. Such environments can be furniture (desks, carpets, etc.), vehicles (cars, trucks, etc.) or for advanced learners: numbers (whole numbers, natural numbers, etc.). Within the applet also a simple mechanism is implemented allowing users the addition of self-created domains.

As mentioned before, within these domains object-orientation and its concepts are shown. The following examples should give an idea of what is possible and how the concepts are presented to the learners.

(1) Domain → Classes → Objects

The starting point is always a domain. These domains are well-known settings chosen from everyday life, such as vehicles, furniture, etc. But, actually we are talking about a collection of objects (cars, trucks, helicopters, etc.), which are concrete instances of classes and which are in turn organized hierarchically.

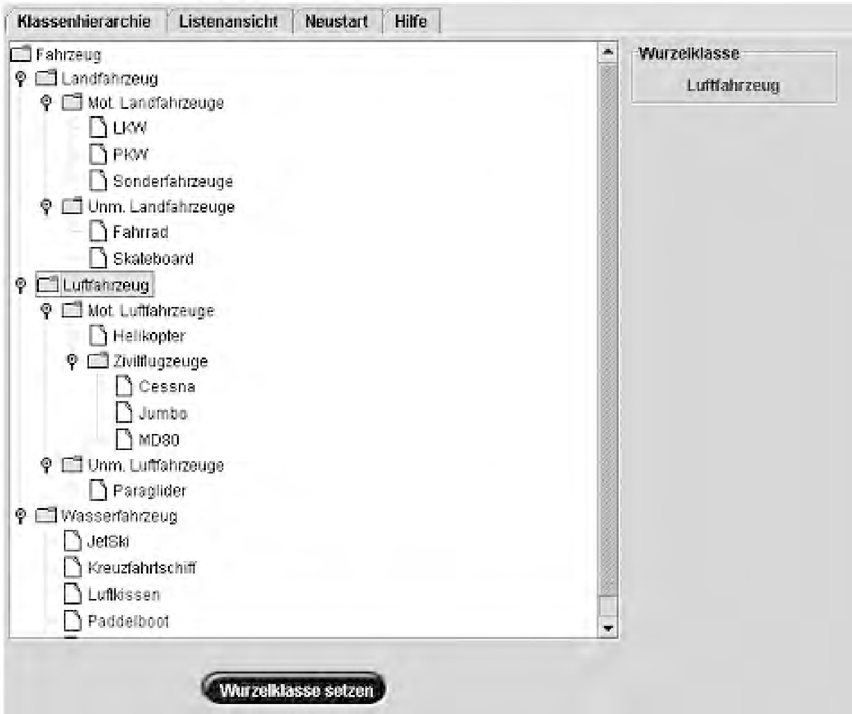

Figure 1. Determining the class hierarchy

After deciding upon a certain class (base class), the learners can then create concrete objects and insert them into lists. Again lists are familiar to everyone (just think of shopping lists). But with these lists one can demonstrate that the class hierarchy is of importance when wanting to create certain objects and the connection between classes, objects, inheritance, etc. becomes obvious.

(2) Objects → Methods → Attributes

One has the possibility not only to build a simple list, one can also choose among different list types (sorted lists, first-in-first-out list, etc.). In this case the learners are able to observe that objects can have attributes. So, there can be objects with the same attribute values or with different ones and that this is of significance. Furthermore one can notice that according to the list type the number of possible operations (methods) varies.

(3) Domain → Abstraction → Domain

Concrete objects are determined on the basis of the domain (class hierarchy). E.g. within the domain vehicles the concrete objects bike, car, truck, etc. can be created. Within the lists these can be shown pictographically. But this is not the only possible visualisation model. While experimenting one can switch among multiple views (Figure 2). Consequently, one can also choose an abstract object visualisation, which has nothing in common with e.g. a bike, but of course the underlying data and the way of thinking.

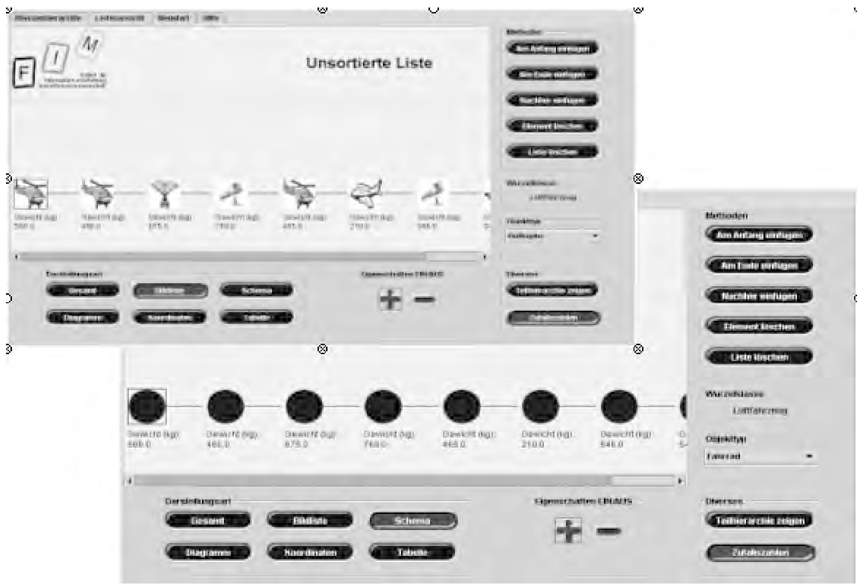

Figure 2. Pictographic vs. abstract visualisation

Consequently, the applet is accompanied by texts, which explain the various concepts illustrated in the applet. One part of this material is a study guide, which leads to object-orientation in form of a dialogue. In this discussion participants of a fictive course on object-oriented programming debate about the various concepts, give examples (again from everyday life), etc. In addition, the tutor of the fictive course discusses object-orientation with a friend, who is a philosopher, and it is pointed out that objects are nothing new or an invention of computer science, but that this is well-known and actually something which bothers the mankind since centuries.

Modelling as precondition for object-oriented thinking

Actually one can classify object-orientation as a special form of modelling real or imaginary worlds. In texts modelling, characteristics of models (i.e. consistency, completeness, correctness), etc. are explained and examples are given.

But, accordingly there is again an emphasis on applets and experiments. Once more, the simulations give the learners the possibility to learn about models and modelling and to try out the concepts formally described in the texts. The following should exemplarily describe one possibility of "discovery".

Another time we start from a familiar background. We look at a map. On the map are towns, streets, etc. The question is: Are two towns (i and j) connected (is there a street between them) or not?

For us, this question is easy to answer. We just look at the map, search the two towns and see if there is a street or not. (We also can easily take the fact into account that there is maybe not a direct connection, but an indirect one by a third town, i.e. i is connected with town k and town k is connected with town j.).

But, to be honest, when we just concentrate to answer this simple question, the map bears too much information. One can also answer this question by simplifying the map.

So one approach in simplifying can be to draw a graph that only includes towns (nodes) and streets (edges) in question (Figure 3) – the first step of abstraction and modelling is performed.

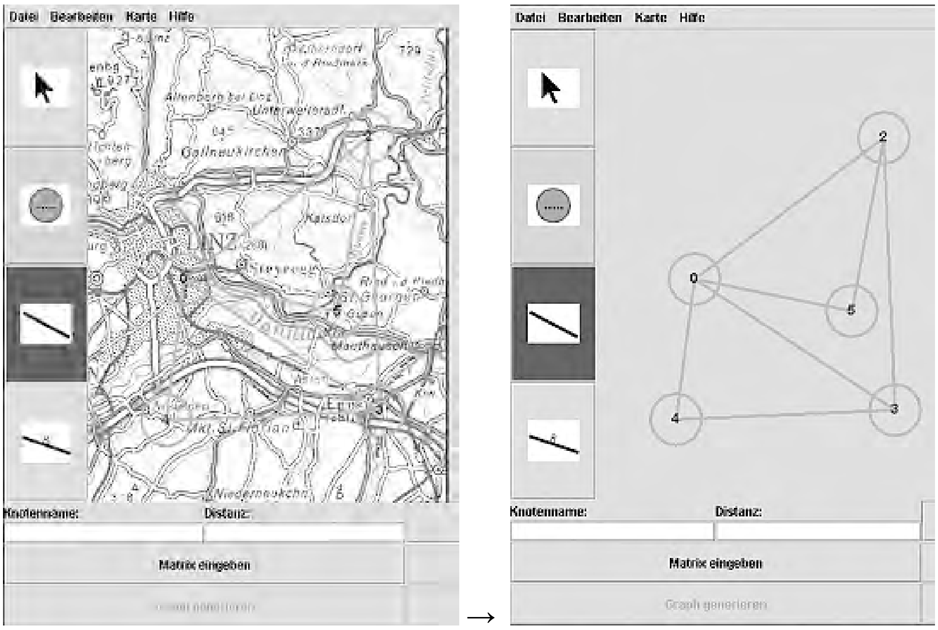

Figure 3. From a map to the corresponding graph

The graph makes the connections much more obvious for us, but it is still not so easy for a computer to answer the given question.

In this case we can make a further abstraction and build a so-called adjacency matrix. This matrix is equivalent to the graph. Each element (*i,j*) gets the value “1” where a direct connection (an edge) exists and the value “0” if there is none (Because we assume that we can drive in both directions, we simply set (*i,j*) = 1 and (*j,i*) = 1). One now has a binary representation, which can easily be computed (Figure 4).

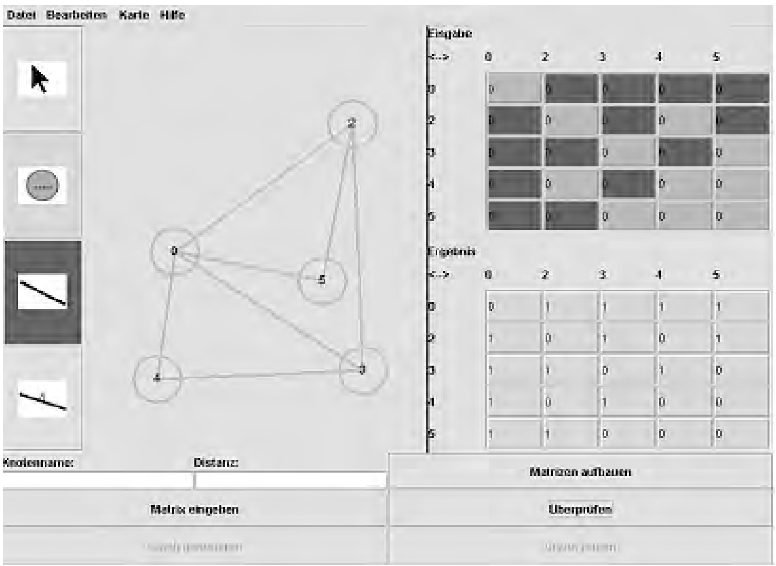

Figure 4. From a graph to the corresponding adjacency matrix

Subsequently, stepwise we proceeded from a common model (a map) to a possible model in computer science. (Sidestep: The applet allows that one can generate the graph, the corresponding matrix, to verify one against the other and also to first create the matrix and then generate the graph.)

Settings for Educators

As didactical methodology “blended learning” is considered as the best approach to use WeLearn.LaVista. A mixture of instruction, coaching and self-studying has at the moment turned out as the best way to learn, comprehend and remember the given information. In order to help educators and to give an orientation how the material can be used productively, we added settings (proposals) with concrete tasks for the learners. In order to allow as many degrees of freedom as possible, tasks are described, which can be performed either individually, or in groups, with and without electronic equipment.

Integration into "Propaedeutic in Informatics"

At the beginning the course "Propaedeutic in Informatics" was mentioned. The aim of the course is to show novices the fundamentals of computer science. Not to go in depth, but to give a good overview. The material presented in this paper has now been integrated into this course. First this allows the learner to see not only one small part (namely object-orientation and modelling), but to see the context, the connection to other topics – to get a holistic picture. Secondly, it is easier for educators (i.e. in schools, other universities) to just choose parts of the course and enhance them with their own material. Last, but not least, it also increases the sustainability and simplifies the distribution of the material, because the material of "Propaedeutic in Informatics" is already wide-spread (available online and offline on CD).

Conclusions and future plans

WeLearn.LaVista is already in use in Upper-Austrian schools, the Johannes Kepler University Linz and the University of Zurich. So far, we have only got positive feedback from the learners. It seems that we are on the right track with blended learning and having given the learners the possibility to experiment on their own. Because of the positive feedback, we have now decided also to enhance other courses (such as "Operating System Fundamentals") with animations and simulations to allow "Learning-By-Discovery".

Acknowledgment

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EXPERIENTIAL LEARNING OF MECHATRONICS IN A MIXED REALITY LEARNING SPACE

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Introduction

In modern vocational training and education, integrated learning scenarios where e-learning is linked with the world of work play an important role. The current generation of e-learning environments does not provide an integrated solution able to meet these requirements in vocational training of mechatronics yet [3]. The European project "Virtual Laboratory in Mechatronics: Access to Remote and Virtual E-Learning" (MARVEL) deals with the above mentioned requirements. The objective of this paper is to discuss some key ideas of the MARVEL project. First we outline the background of MARVEL, followed by a brief discussion of its pedagogical concept. Then we will introduce our approach of a *mixed reality learning space* which compromises a taxonomy of learning media, places and activities. Before concluding, some learning scenarios are presented to illustrate the proposed approach in practice.

The MARVEL Approach

MARVEL is an education and training project funded by the European Leonardo da Vinci programme. The project focuses on learning arrangements allowing remote and distributed working with laboratories, workshops and real working-places in the field of mechatronics [6]. A major goal of the MARVEL project is the usage of real worlds in virtual learning environments in order to support work-process-oriented learning with real-life systems from different learning locations. Telematics, remote and mixed reality techniques are used cooperatively within a network that includes colleges, industry partners, and national bodies dealing with certification and standardisation issues. Thus the project has an organisational development goal, which is the co-ordination of learning facilities in different institutions and countries to form a transnational learning network of remote laboratories and distributed workshops. Currently the MARVEL project consists of seven member institutions as shown in Figure 1.

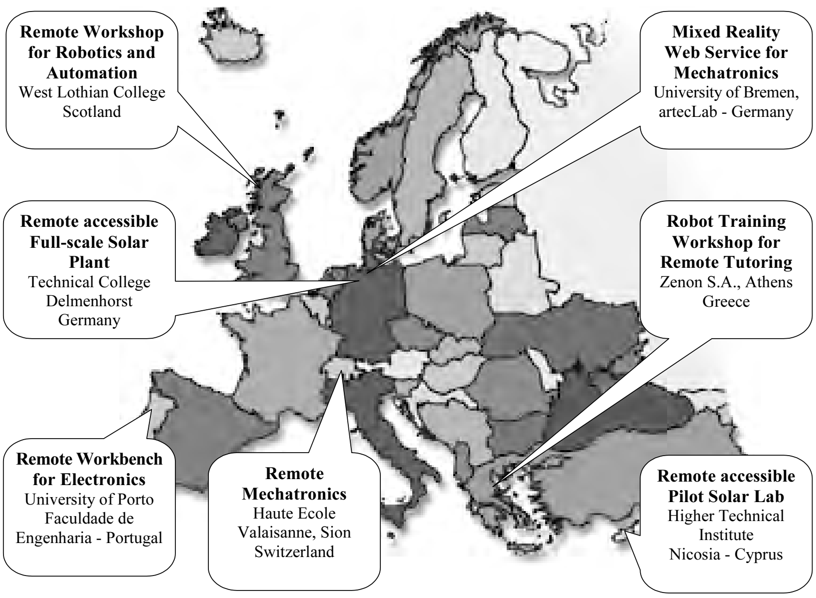

Figure 1. The MARVEL network of distributed labs and workshop facilities

The MARVEL project evaluates and makes available working examples of remotely accessible practical environments, including e-learning and student assessment materials for various application fields and use cases. In relation to real work tasks, the training of non-technical skills such as teamwork, the ability to communicate in foreign languages, intercultural competence and customer orientation, will be an important goal in the MARVEL learning scenarios. Working with remote work assignments, experiments, collaboration in distributed teams and communication in a foreign language with students from a partner college may help to develop and train these soft skills.

Pedagogical concept

In our approach we try to combine simulation training, remote lab experimentation and learning-by-doing on real-life systems to reduce knowledge transfer problems between virtual and real systems. The MARVEL project follows an innovative paradigm in engineering education and vocational training by supporting local and distributed learning based on merging virtual and real labs and workshop facilities. Mixing tangible objects of real work spaces with the digital representation of information spaces, is an approach that witnessed an increasing interest during the last decade [6, 1]. This concept – also known as Mixed Reality – provides an interesting idea which comes close to our requirements.

In relation to the MARVEL project our research is less focused on technical issues[1] of Mixed Reality and more on the question of how to organize and arrange learning spaces for distributed learning and working along the *reality-virtuality continuum*. Thus the approach in MARVEL, which is presented in this paper, describes an organisational concept, in terms of learning scenarios and their implementation into learning and/or working processes. It is based on the idea of a mixed reality learning space that spans the reality-virtual continuum and integrates the local and remote as well as different learning activities. Figure 2 illustrates the dimensions of the mixed reality learning space and shows the range of choices available and the possible interaction among the various technological alternatives.

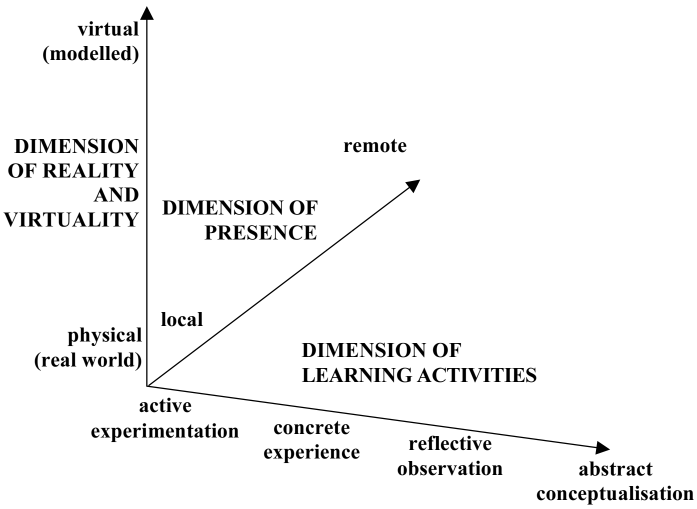

Figure 2. Mixed Reality Learning Space

There are three motivations behind this taxonomy. First it allows to explore the didactical impact of virtual as well as real (physical) learning media and tools in the learning process. Second, such a taxonomy may identify which learning activity requires which tools. Third, producing a clear taxonomy helps to build a *rich* learning environment, which has the capability to support different learning modes and styles. To illustrate the practical use of this taxonomy, the three dimensions will be explained more in detail:

1. *Dimension of reality and virtuality:* The dimension of reality and virtuality (reality-virtuality continuum) concerns the extent to which a learning media/tool is either totally virtual or is based on the physical world. This spans the extremes from fully virtual environments (e.g.

[1] More about our technical approaches in connection with Mixed Reality see BRUNS [2].

virtual lab, computer-based simulation, digital worlds) to wholly physical environments (e.g. work-based learning, on-site training).

2. *Dimension of presence:* The dimension of presence concerns the extent to which a learner or a group of learners is acting in their local space “the sense of being there” or interacting from remote. This spans face-to-face on the one side and distance education on the other. Face-to-face learning still plays a major role in education and training. The advantages of classroom learning, because of the direct contact, both in and out of class, can engage students in thinking and interaction through questioning, discussion, small-group presentation, role play, and case studies. In practices, the advantages of face-to-face and distance learning methods might complement each other.
3. *Dimension of learning activities:* This dimension covers different learning modes. In line with the theory of experiential learning [4], which is the educational concept behind MARVEL, there are several underlining modes that characterize a learning activity: action, experience, reflection, and conceptualisation. As the learning process is not identical for all people, different learning styles can be distinguished as well. Preference for one or more modes over others indicates a preferred learning style. But learning styles are also context-dependent. Depending on the learning task, the experience with the learning subject, and the point in time when learning takes place different learners will adopt different learning styles for the same task, and a single learner may change learning styles from one situation to another. Consequently, an appropriate environment that accommodates various learning styles is essential for effective learning [8].

Learning scenarios

The learning scenarios considered in MARVEL address various mechatronic systems and use cases, but concentrate initially on process control, robotic systems and computer integrated manufacturing and electronics. A brief characterisation of these learning scenarios is presented in the table below.

Table 1: MARVEL learning scenarios

Learning scenarios	Settings and course trials
1. Distributed process monitoring, control and maintenance of a solar plant	Classroom-only and various types of mixed classroom-workplace learning settings, including remote experiments and teaching sessions with teams from partner colleges in different countries.
2. Configuration and programming of a robot with support by a tele-tutor	
3. Distributed diagnosis and maintenance of a modular production system	
4. Exercises in remote engineering and mechatronics	
5. Remote experiments in electronic circuit design	

Various experiments have already been evaluated in a local setting with students [7, 5]. Distributed learning settings will also be evaluated, where students will access virtual and physical laboratories and workbenches from a remote partner institution. A teacher, assuming the role of a tele-tutor, will support these learning sessions via Internet. In further course trials distributed learning groups will collaborate via Internet and solve a typical maintenance task, requiring them to program and/or configure a real mechatronic system. For safety reasons, their ability to modify parameters remotely is limited, and the learning task will be supervised by an instructor at each site. As a complementary action to distributed settings, teachers will hold a joint teaching session with the partner colleges, using their local lab facilities.

An important aspect within MARVEL is that concepts and examples for real working and learning are developed and accessed virtually through remote processes. These concepts support the social aspects of learning, as learning is necessarily integrated in communication processes, among different learning groups while working at the same machine. Because learning by experience in a real and social context is more and more restricted in pure virtual environments, our taxonomy of a Mixed Reality Learning Space might help to make the appropriate didactical decisions.

Conclusion

This paper outlines some key ideas of the MARVEL project. The approach, which is presented here, describes an organisational concept, in terms of learning scenarios and their implementation into learning and/or working processes. It is based on the idea of a *mixed reality learning space* that spans the reality-virtual continuum and integrates the local and remote and different learning modes. This can be achieved by learning arrangements where e-learning with simulations and remote laboratories is combined ("mixed") with experiential learning in real laboratories and at the workplace. Our approach is seen as a step for realizing the concept of "Virtual-reality e-learning" within a particular subject field of mechatronics. E-learning or even Blended Learning – in the classical sense characterized as web-based training – is limited in scope because learning experiences are restricted to working within virtual situations. That is why a learning concept following the idea of mixed reality could promise new learning perspectives and could go further than Blended Learning.

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RETHINKING THE PARADIGM OF E-LEARNING: CAN DIFFERENT CULTURES OF LEARNING BE MODELLED INTO ONE PIECE OF SOFTWARE?

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Assumption: eLearning is dead

In reality eLearning is not dead, it just never really came to life. The term 'eLearning' is a remain out of the days where virtuality seemed to provide an easy way to face the daily struggles of life in any possible situation. Especially the fact that more and more people had to learn or rather incorporate more and more facts and predefined processes in rapidly decreasing time spans forced institutions, companies and societies in general to look after new forms of teaching, providing higher educational levels (whatever this may mean!) in lesser time.

And the computer, more exactly spoken: computer networks providing vast possibilities for participation in what people then frenetically called the 'information society' seemed to be the solution for the aforementioned requirements. So for about one and a half decades different people for different reasons (many of them just economic reasons) sermonized on 'a change of learning paradigms', not having people going to certain institutions, such as schools and universities, to get educated, but forcing these institutions to provide learning materials (not education!) from a distance. Nowadays we know: This concept failed.

Why did it fail? The changing brands of the above concept might give us a sign: The names used more and more emphasized on the term 'learning', making the 'electronic' part slowly disappear (distance l.) or just becoming a part (blended l.) of an educational concept. Truth is: failure was preassigned, because people solely focussed on which tool(s) to use for achieving a goal that was not yet defined. Or as the famous Austrian cabaret artist Oscar Bronner once stated (concerning a ride on a motorbike): "I don't know where I'm going, but I'll be there in lesser time."

Of course for certain parts of the computer and immersing new 'eLearning industry' this situation was more or less something like paradise on earth. As nobody really had even the slightest idea, how 'eLearning-Software' should function and therefore how it must be designed, many products came to life, most of them derived from software that was originally designed for totally other purposes, sometimes even more or less unchanged. No wonder that the final hype concerning eLearning-Software came right after the ending of the eCommerce-boom around 1999/2000, when many vendors had to rethink their businesses and find new markets for their products. And so they sold content management systems (CMS) to the educational sector, re-branding these as 'eLearning Solutions'. And the world had yet another type of software that mainly caused annoyance within its users.

And so eLearning was almost killed, despite a growing need for it.

From history to the present: eLearning is maybe (or hopefully) dead

In 2005 it is just fine to be back in reality. Back to basics: learning in any form can never be virtualised in any way. Learning always has to be seen in a context to our real environment, history and culture. Take an aviator as a short example: As long as he is doing lessons in the flight simulator he is memorizing information and predefined sets of procedures. But he would never be able to cultivate it, as long as he is not given a plane, passengers, etc.

So the main lesson to be learned is: eLearning – if we define it as a use of computers in learning process – itself is not per se a bad thing. Just think of the pilot going onto his first flight without any training on the simulator. But which type of simulator would one use to train this fictive pilot? Of course everyone would agree if the answer given is something like: 'the one that fits best', i.e. it depends on the job and the type of plane the aviator would probably fly in the future. No one could understand if every future pilot on the planet, be it a fighter pilot or a personal carrier pilot, flying a huge freight carrier or just a small private plane, would be trained on a machine simulating the new Airbus A380.

But, strange enough, this was the approach taken when it came to eLearning and the respective software. Suddenly teaching should have been done (and unfortunately was done) using software that claimed to be the one-fits-all solution for every student, every purpose, every culture and every content around this whole wide world. The result of this approach was of course again annoyance and frustration within the vast majority of those who had to work (either as students or as teachers) with this software. Result: eLearning was dead.

It seems to be that eLearning of any kind is just bound to fail, because of its apparent inability to incorporate exactly those factors that make up successful cultivation of knowledge. This is not certainly true. But we need to revise the 'change of learning paradigms' that came along as the advance guard of eLearning. We have to keep in mind that not the 'e' but the 'Learning' part of the whole paradigm is the crucial one.

So what has to be taken into consideration is that successful learning depends on a whole bunch of factors that make up the differences between eLearning situations we mainly see at the moment. Those of the highest importance amongst these might be:

- The student: students do not only live (and learn) in a certain environment, they also form and change this environment, again depending on different factors like culture or just the profession they are studying for;
- The teacher: Of course each of us has a distinct way of teaching that is in a strong context to our own personal being and experiences as well as the students and the content of the lessons;
- The content: Different topics might need different teaching approaches;
- The overall environment:
  - Is this a 'classical' university environment, with teachings closely related to research works and aiming to analytical skills of cultivating knowledge?
  - Is it more the sort of education directly leading to practical skills?
  - Is it primary, secondary or tertiary education?
  - Are we aiming to have students that are able to think critically and develop their professional practices in cooperation with their colleagues?

And then all these factors (and probably many more) affect each other, leading to a sheer unmanageable number of combinations and therefore different learning situations. *And a good, experienced teacher will automatically react upon these situations and provide the optimal way of learning for his/her students.*

What was not taken into consideration yet is another highly important factor for learning: Learning by doing and informal learning, just getting experience, which is perhaps the most important factor of lifelong learning, despite the fact that it is commonly ignored when discussing educational concepts. This is mostly because learning is seen from the teachers' and institutions' perspective and therefore considered being just the opposite or rather the reverse of teaching. In reality, gaining expertise by experience is perhaps the biggest part of what is commonly called and experienced as 'learning'.

With eLearning the problem is that all these considerations have been claimed to be managed by a simple content management system with online discussion forum, chat, electronic whiteboard and other bells and whistles?

From present to the future: Long live Learning with the little "e"

Looking at the above factors one realizes that successful cultivation of knowledge – successful learning, whereas the simple memorizing of facts is not what we consider being successful – is a matter of several different factors. What comes to mind is that the crucial point is not so much to consider WHAT to do, but to a high degree HOW to do it.

Speaking of eLearning the lessons learned are:

- eLearning of any kind should, if possible, rather be a supplement to classroom teaching – that's what was already stated when designing the concept of blended learning.
- The one-fits-all study subjects, students and teachers approach is bad.
- Every lesson done by means of eLearning – totally or just by usage of ICT as a support to other forms of teaching – must be planned carefully and individually concerning the didactic concepts, the course environment and finally the technical tools used.

What makes eLearning difficult from a teacher's perspective is of course the fact that one is struggling with the problem that two conflictive facts have to be considered. On one hand eLearning should be done under the same assumptions as 'classical' teaching (s. above), whereas on the other hand there is a huge difference: direct interaction and feedback are difficult, often impossible, to achieve.

The main assumption that can be taken for now on is, that if one is able – mainly depending on the tools, i.e. the software – and willing to take all the above factors into consideration, successful eLearning can be implemented.

Parenthesis: Lessons learned in daily practise

Since summer 2004 FH Joanneum, Dept. ITM has been offering a new course called 'Software Design' which is targeted on higher education (Masters Degree) for adults already in work life. One of the cornerstones of this courses' design was a ratio of about 60 to 70% of distance learning.

When evaluating possible software to support this aim in spring 2004 we quickly fell into a state of shock, as most of the software offered was totally unusable in one or the other respect. Besides being unreasonably expensive, many of the programs tested failed to comply to some fundamental demands, such as platform-independence (in respect to operating systems), flexibility or a comprehensible underlaying didactic concept. Some of the software simply did not even work at all.

What was astonishing during this evaluation was the fact that there was no evidence of any quality gap between Open Source Software and commercial/proprietary programs. In fact two Open Source Solutions proved to be those providing the biggest benefit for our course namely Moodle [http://www.moodle.org] and FLE3 (Future Learning Environment 3 [http://fle3.uiah.fi]). The first one providing an multi-purpose solution for many use cases the second one providing a distinct solution for collaborative knowledge building. Unfortunately, technically spoken these 2 were more or less incompatible due to their different underlaying technologies, though as being open source software with standard application interfaces, the possibility to have a single login and some level of change of data between the system would have been possible to implement.

About at the same time a survey [BM:BWK, 2004] concerning content management systems for educational purposes was done by the Austrian Ministry for Education (BM:BWK) and the Zope [http://www.zope.org] / Plone [http://www.plone.org] derived product EduPlone [http://eduplone.net] was one of the three (out of 220 tested) recommended products for use in education.

As our department has a strong emphasize towards Open Source Software the decision was taken to go our own way using as much as possible of software products already known and proven for certain tasks. Among those were VNC for remote presentations, VoIP products, remote whiteboards and others.

All these were glued together with the help of the Plone CMS which was also responsible for user management and authentication in conjunction with the Active Directory infrastructure used throughout FH Joanneum.

This system went online after only about three months of development and setup in September 2004 and has since been the backbone of our 'Software Design' degree program. During one Semester of learning on the job we all gathered a lot of new experiences concerning distance education – although many of them were nothing new, but just common teaching knowledge.

The main conclusion drawn was that in reality eLearning did not function the way all the 'experts' told us it would work. And yet we were able to establish a well functioning degree program based on eLearning. A contradiction? Perhaps at first sight, but not if one is willing to dive deeper into the matter. The whole thing works because we did not take the product-centric approach usually taken when eLearning comes to mind. When considering eLearning the problem to be solved is not the decision which software to use, but rather one has to take the whole environment of the course in question into account – just as stated in the chapter above. Only at this point, knowing exactly about the course environment, one is able to choose the tools of choice for each specific task of learning.

Back to the future: eLearning under the hood of 'The Trash Heap'

The experiences gained throughout our work within the aforementioned course brought to mind that a different approach (in comparison to existing eLearning software) had to be taken when designing such a system (BTW: the best products available in the moment, e.g. Moodle, are those that derive directly from practical teaching). And so in autumn 2004 the following institutions teamed up for a project that was named after the famous omniscient trash heap from Jim Hensons' Fraggles, *The Trash Heap (**T²H**)* [http://elearning.fh-joanneum.at/t2h/] (The Trash Heep of the Fraggles is a kind of exact opposite of the Muppets' Swedish chef joggling eggs and mumbling when one should cook). The partners of the ***T²H*** project are:

- FH Joanneum, Depts. ITM (Internet-Technologies & Mnagement), IND (Informations Design), ZML (Centre for Multimedia Learning);
- UIAH, Media Labs, Authors of FLE3;
- EduPlone EEIG, Authors of EduPlone;
- Reflab [Reflab Website], Authors of Plone Campus.

So what does ***T²H*** aim to provide: A common platform containing software building blocks of all sorts, that are able to interact and exchange data as well as being ready for (almost) arbitrary combination within an institution or course. This way ***T²H*** is not another eLearning platform of learning management system (LMS), but rather a toolbox with durable material to set-up your own environment. All this will be done using the benefits of Open-Source Software, which in this case are (amongst many others): re-usability of existing code and concepts, easy cooperation with other institutions, non-proprietary data formats, avoidance of social barriers in education, flexibility and independence.

Main technical concept

General

First of all ***T²H*** should be a strictly modular system, allowing any user to easily combine as many of the modules as desired to build up his or her own eLearning environment, perfectly fulfilling his or her individual needs. Secondly seamless usage of already deployed services and resources through ***T²H*** must be possible. For example, as every educational institution uses some sort of software for administrating students and personal ***T²H*** must be able to gather the respective data from these systems. Of course the same applies for data from course-schedules or the like.

These two requirements demand for exact definitions of the respective interfaces between the individual modules themselves and moreover between ***T²H*** and 3rd party software. A lot of the system will not be written from the scratch but rather by reusing existing Open Source components, such as Fle3, Plone and Connexions [http://cnx.rice.edu/].

User interface

T²H should be usable on any system providing moderately modern web browsers. Interactive content should be embedded using techniques like Java™-applets, Tcl/Tk-plugins or probably Flash™. Additionally a cross-platform rich client is to be developed, providing a smoother UI compared to pure web technologies.

Building blocks

As said before ***T²H*** is made up of modules that can be combined in almost any fashion. These modules can, roughly spoken, be grouped into 3 different flavours:

- *Didactic modules*: Didactic modules provide implementation of common (and not so common) didactic principles, developed or feasible for distance education. Examples for such modules could be amongst many others: FLE3 / knowledge-building as an implementation of *progressive inquiry* (Kai Hakkarainen / University of Helsinki) or EduPlones' implementation of *Web-Didactics* (Hannes Meder, project *L3, Life Long Learning*);
- *Administrative modules*: These are responsible for transferring or storing and contextually displaying of administrative data, e.g. course descriptions, curricula, course-schedules, students and so on;
- *Helper modules*: Helper modules provide additional functionality that can be used during on- or offline-lessons, for example: distance (multimedia) presentations, remote whiteboards, online chat (textual), voice (and video) conferencing, wikis, forums, up- and download areas, import / export of learning material and many more.

Middleware

One of the main cornerstones of a modular, open environment has to be a 'glue-layer' that keeps things together and provides all the necessary interfaces for inclusion of different modules and their respective interaction. Technically spoken this middleware layer is the lynchpin of the whole system as literally all information that is needed by any of the modules must take its way through this layer (and will probably be processed within it in one or the other way).

The main tasks of the middleware therefore include:

- Interfacing the storage backend;
- Data normalisation;
- Providing of common data (in normalised form), e.g. student data, course data, etc.;
- Providing a standard API for the respective ***T²H*** modules and interfaces to external systems.

Given the fact that the system should at first be 100% web-based, quite a few similarities between this middleware-layer and a content management system (CMS), regarding these specifications, come to mind. So the decision seems clear that this middleware layer will be built based on the sophisticated object-oriented *Zope* web-application framework and the highly acclaimed Zope-based CMS *Plone*. Another reason for this decision is the fact that quite a lot of very usable components of several types already exist for this platform and thus can easily be adjusted for and integrated into ***T²H*** and the fact that Plone is one of a very few products in the fields of CMS that poses a strong focus on usability and accessibility. It fully complies to W3C's standards [WAI] concerning accessibility of websites for handicapped people. This too is a fact that must be taken into consideration when choosing or designing software for educational purposes.

Didactic and usability concepts

General

Of much higher importance than the technical implementation in terms of eLearning is the underlaying didactic concept. And the crucial point of ***T²H*** is the fact that there is no such didactic concept included into the core system. Instead this core system (which is mainly what is being described as the middleware plus all interfaces above) provides all necessary facilities and functions to realize almost any kind of didactic concept within ***T²H*** in the form of a module.

This and only this approach allows any teacher in any situation to pick the adequate module, therefore the best fitting didactic approach for this certain situation, without having to accept a (perhaps even bad) compromise, just because the platform he/she uses does not provide the necessary functionality.

So, why is this so important?

Different courses, different teachers, different students, they all demand for different learning concepts. And, of course, any possible combination of these factors will again change this focus. As a humble example out of the authors experience you might consider students of technical studies that are being confronted with content of economical courses. They will surely react very different compared to students of economic studies that focus on that content and therefore will not consider these lessons (at best) boring, if not even useless (the technically oriented students usually do so!). So from the didactic viewpoint you might have to adopt the way of teaching these contents according to the audience.

And this is exactly what ***T²H*** is trying to achieve by its strictly modular architecture. It provides a toolbox, filled with a whole bunch of tools, that share on thing in common: They all complement each other and they all fit perfectly into the box (i.e. the ***T²H*** framework). Again, many of these tools do already exist as standalone products. But already the simple combination of two such tools within one course might demand for two different user-bases with their respective administration tools (and of course the user-administration is again not based on any existing user-base...). Moreover the look-and-feel and the user-interface of the two products will be totally different, leading to confusion amongst the students (and perhaps the teacher, too).

On the other hand, some of the main modules of ***T²H*** simply do not yet exist. At best there might be a proof-of-concept study of one or the other didactic concept (a lot of research work has been done in these fields during the last years), but these are very often quite rudimentary and not yet usable on a regular basis.

Outlook

T²H is now (January 2005) being evaluated by a committee of the Austrian Ministry for Science and Education, preparing a decision regarding government funding by March 2005. Independent of their decision we will incorporate as many of ***T²H***'s possibilities as possible into our own teaching work. Besides that ***T²H*** will also become a part of our further R&D work as well as of students' project works. That again gives us the charming prospect of not only testing and evaluating our work in real life but also to provide a secondary feedback loop when having our own trainees working on their fellows' training-base.

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E-LEARNING AS A MEAN FOR TRANSITION OF HIGHER EDUCATION TOWARDS THE PARADIGM OF LIFELONG LEARNING

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Introduction

"The Age of Education and Training, which has served us well in the industrial and post-industrial age, is giving way to a new paradigm of Lifelong Learning which will dominate the 21st century – the Learning Century" (Longworth, N., 2002, p.121).

This new approach to education has been the object of discussions in Europe since the mid-60s. The first statement on 'lifelong learning' was introduced by UNESCO in 1972. In Lithuania discussions on this theme and first initiatives started after 1992 when the Conception of Education was created. As late as 2004 the strategic document on lifelong learning was released in Lithuania. Thus, representatives of higher education institutions have to evaluate the existing situation in the context of the lifelong learning paradigm and predict its learning potential.

This paper aims to describe the situation in which a institution of higher education finds itself while attempting to initiate ODL and e-learning as a means for transition from education and training towards lifelong learning.

Theoretical background for the transformation of the study process

According to Longworth, universities "are natural places to initiate, develop and maintain lifelong learning programmes". One of the ways facilitating that shift is "a more innovative approach to the use of educational technology, networks and open/distance learning in teaching and research" (p.121, 2002).

Seeking to find out how to organise the study process in higher education in pursuance of translating lifelong learning ideas into action, an analysis of previous research was undertaken. The analysis revealed that ODL and e-learning "involves a new approach, which must take into account pedagogical, technological and organisational features to form a well-designed education system" (Jochems, W., 2004). Summing up the analysis, the new learning approach can be conceptualised as a three-dimensional sphere:

- **Educational dimension** is defined as a shift from teaching to learning that can be estimated by the degree of *openness in learning* (Coomey and Stephenson, 2001);
- **Technological dimension** is defined through the growing usage of information and learning technologies (ILT) in education that are representative of the emerging the new form of learning defined as *e-learning*;
- **Organisational dimension** is defined through the change of organisational forms of the study process. These can be described through the degree of *flexibility* in the organisational form when anticipating, and responding to the ever-changing needs and expectations of clients (ANTA, 2003).

The parameters of the educational dimension

A teacher and a learner bring into new learning situations the understanding of knowledge from their previous experience. These new learning situations can be built on different conceptions of knowledge. Additionally, reflection on and coordination of conceptions of knowledge become key factors for an effective process of knowledge building. Thus, the new educational paradigm of lifelong learning requires a change of attitude in the three concepts: Learning, Knowledge and Teaching.

The Concept of Learning can be described as evolutionary, perceived as a transitional process from a traditional view of learning towards open-learning. Kemmis (1998) describes this process as consisting of four stages: 1) a pre-modern stage based on the notion of repetition, 2) a modern stage, based on notions of progress, development, expansion and extension, 3) a late modern stage, based on notions of problematisation and critiquing, and 4) a post-modern stage, based on notions of the situation/location of narratives which claim no transcendent justification.

The Concept of Knowledge has been revised consistently with the changing attitude towards learning. This change is similar to the evolutionary process of learning: 1) in a pre-modern stage knowledge is perceived as fixed and given; 2) in a modern stage – as evolving, i.e. going "deeper into" or "beyond" surface appearances; 3) in a late modern stage – as reflexively constructed in relation to cultural, socio-political and material conditions; and 4) in post-modern stage – as reflexively constructed in relation to cultural, socio-political, material and socio-biological standpoints and identities.

The Concept of Teaching complements the concept of learning. Ramsden (1992) suggests that teaching can be perceived in three ways: 1) as telling or transition (subject orientation); 2) as organising of student activities (method orientation); 3) as creating conditions that enable learning (learning environment orientation). The first approach complements the pre-modern stage whereas the last characterises the contemporary approach to teaching.

While planning the learning process the attitudes to learning, knowledge and teaching have to be harmonised. This is the key to opening learning. The notions of learning, knowledge and teaching can be treated as parameters of the educational dimension. Openness can be the measure of these parameters, which enlarge when the learning process changes from teacher controlled towards learner managed (Coomey and Stephenson, 2001).

The parameters of the technological dimension

The rapid development of technologies in the 20th century made a significant impact on all social institutions. This phenomenon had the greatest effect on education, where it manifested itself on two levels: technological innovation and the perception of possibilities of global change (Bertran, 1993). Since 1960, in educational practice worldwide technologies have been acknowledged as one of the most effective preconditions for long-term sustainable change in education.

The integration of IT into the system of education should be a consistent process, characterised as a gradual introduction of different types of technologies, i.e. IT, ICT and ILT (BECTA, 2001-2003). IT is the lowest level technology, which allows one to fulfil a task and to improve the quality of data processing and delivery of information by computer use. ICT are higher-level technologies that enable communication with other learners including the sharing of learning material on the Internet. ILT refer to the use of IT and ICT for the delivery and management of learning. The last can be applied only after the first two levels have been mastered.

The type of technology in use is an indicator of the technological dimension, whereas its function could be considered a measure. Three main functions of technologies can be distinguished: 1) providing a learning environment for learners; 2) providing an environment for development of didactical structures; and 3) providing an environment for learning management and administration (Jansen and other, 2002).

The parameters of the organisational dimension

The shift from 'school teaching' to flexible learning is conceptualised as reorientation from the provider-perspective to the individual-(client)-perspective (Holmberg, C., 2002) From the organisational viewpoint an educational organisation can meet learners' needs and expectations by enabling the realisation of various learning scenarios. Flexibility of organisational forms of the study process can be achieved through:

1. *Diversity of organisational forms*. This is realised via blended learning by combining distance and contact learning, online and offline, synchronous and asynchronous forms of learning or by combining the use of electronic and traditional learning means. A higher level of flexibility is achievable when an organisation can accommodate the modality of provision according to requirements of each specific learning situation.
2. *Alternative pacing*. This is realised via alternative pacing, when a provider can deliver the same programme/course in several scenarios that differ in intensity of learning. A higher degree of flexibility is achievable when an individual learner can choose his/her own pacing in the programme.
3. *Individualisation.* This is achievable via individualisation. In this context, a different level of learning scenario individualisation can be realised. A learning scenario could be modified by adapting it to the needs of a group of students. Parallel scenarios of a course could be offered for different subgroups inside a single group of students or each student could be given a possibility to study according to his/her individual learning needs.

The diversity of organisational forms, alternative pacing and individualisation can be regarded as parameters of the organisational dimension, whereas flexibility can be the measure for this dimension.

Openness of learning, flexibility of study process organisation and the diversity of technologies characterise three dimensions, namely, educational, organisational and technological. According to the three-dimensional model of study process, the transformation of the learning process at an institution of higher education can be achieved through the integration of these three elements.

Transformation of a learning organisation by integrating new type of technology into the study process

According to Hanna (1998), this external demand encourages and enables institutions of higher education to create new innovative organisational models by integrating improved learning technologies that motivate the existing institutions to change.

Change should be initiated as part of the overall policy and strategy of an organisation, its management of human, financial and physical resources, support and administration. Different stages in adoption of the new ILT integration paradigm can lead to different degrees of organisational transformation (BECTA/NCET):

- *Localised* adoption is characterised by the integration of single ILT elements by some students.
- *Co-ordinated* adoption is characterised by the responsibility of senior staff for coordinating efforts, the usage of ILT for supporting and enhancing existing teaching and learning at the institution, the recognition of additional skills to support the integration and the budget line allocated for the introduction of ILT.
- *Transformative* adoption foresees the revision of the organisational structure, creation of new management posts; coordination and integration of learning and learning resource provision; active participation of all staff members; new approaches to teaching and the support of a range of learning styles; funding of staff development.
- *Embedded* adoption ensures that ILT is used for learning, management and administrative purposes. The staff take responsibility for identifying their own development needs; IT based monitoring and a quality assurance system is implemented; innovative methods of funding ILT are explored and implemented.
- *Innovative* adoption is characterised by significant strategic commitment to use ILT in flexible course delivery, management and administration. ILT becomes an integral part of organisational culture.

The degree of transformation within an institution relates to the wider exploitation of technologies, qualitative changes in teaching and learning process, and the realisation of lifelong learning principles.

The analysis of practical initiatives at Vytautas Magnus University

Two examples of ILT implementation: a course 'Dealing with Change in the Context of Educational Reform' and a course of continuing education programme 'ICT in Education' organised at the Centre of Educational Studies (Vytautas Magnus University), were chosen for the analysis.

Case 1. The course 'Dealing with Change in the Context of Educational Reform'

The first attempt to implement ILT was implemented in the framework of the international Leonardo da Vinci project AYTEM (Accompanying the Young Teacher into the Educational Market 1998-2000). The course 'Dealing with Change in the Context of Educational Reform' was targeted at young teachers, education innovators who are improving their qualifications, as well as at teachers seeking additional pedagogical qualifications. A unique learning environment was developed for the course. Three foundamental interrelated elements frame the AYTEM Virtual Learning Environment:

a. Environment of individual learning (CD). The main learning materials, tasks and exercises as well as learning support means (a portfolio system, a diary and interactive tools) are provided;
b. The environment of collaborative learning (LUVIT) is used to ensure effective communication among participants of the course, and
c. AYTEM Web tool for exchanging the outputs of learning and feed-back; for monitoring the process and for updating materials on the CD.

The AYTEM course had two cases of pilot testing: during the project development and after the project completion at Vytautas Magnus University.

The analysis according to the three-dimensional model of study process

Educational dimension. In the course the integrity of knowledge, learning and teaching is foreseen. The learning process has to be constructed according to the third stage of learning concept, which focuses on reflection and knowledge-construction involving communicative activities.

Technological dimension. The design of the VLE foresees the implementation of ILT to facilitate online learning, tracking and assessment of learning. The course requires high qualifications from all participants involved: teacher, students, tutors, administrators, as all three types of technologies are employed.

Organisational dimension. Flexibility of the course is restricted by the form of the course, which is purely distance. The restriction comes also from the means of communication that are solely asynchronous. Considering pacing, the course can be implemented in different time frameworks. This variation has limited potential due to the structural rigidity of the course and requirements that are set for the learners. Concerning individualisation, the course foresees the support for individual learning trajectories by choosing the level of completing tasks. To sum up, this dimension has limited possibilities for organisational flexibility.

Three-dimensional analysis revealed that openness of learning, flexibility of the organisational form and the usage of ILT technologies are not harmonised in the course: openness in learning and ILT usage requires a higher degree of flexibility of the organisational form of the study process. This conclusion was confirmed during the pilot testing of the course.

Testing also revealed the gap between readiness of students to use technologies in learning and requirements of the course. Students met high IT and ICT literacy barriers and difficulties when entering this new learning environment. Therefore, most of the students have not yet achieved the goals of the course. The usage of LUVIT was restricted in 2001 and the integrity of the AYTEM learning environment has been damaged. Later, separate interactive tools were utilised in different traditional courses and several small projects were initiated the objective being to extract interactive tools and to place them online.

Case 2. The course 'ICT in Education'

The course 'ICT in Education' was developed at the Centre of Educational Studies with the initiative of local teachers. There are two versions of the course that differ in curricular focus: one is a Masters' degree programme of educology and the other is a programme of vocational studies for English language teachers. Both programmes are provided in the part-time study form for adults. The VLE First Class (FC) forms the core of the virtual learning environment and ensures learning resource handling, communication and collaboration, administration, monitoring and managing of learning processes. Videoconferences replace face-to-face interaction for some groups. All lectures are recorded and placed online (ViPS system). The course 'ICT in Education' was created in 2002 and has already been delivered five times for about 220 students.

The analysis according to the three-dimensional model of study process

Educational dimension. The course was designed referring to the third stage of the learning process. The learning in this stage is based on reflection and knowledge construction involving communicative activities.

Technological dimension. First Class was employed for the administration of studies, facilitative learning online, tracking and assessment of learning and learning support, development, standardisation and reuse of didactical structures (structure of the VLE, tasks and exercises, materials).

Organisational dimension. In the course the following learning forms were integrated: distant with face-to-face learning, e-learning with traditional learning, online learning with off-line learning, means of synchronous communication with means of asynchronous communication. The structure of the course allowed three alternative pacing scenarios. Individualisation was implemented according to the needs of a group of students or different subgroups within one group.

From the perspective of the integrity of these dimensions the course can be treated as integral. All cases of course delivery also showed that the course corresponded to the needs of students and their potential. The course was updated and adapted for each delivery. Videoconferences were suggested as an alternative to face-to-face meetings for some groups. Resources in the virtual library were renewed for each new delivery. New lectures were recorded and moved online. Experiments with the virtual conference format were carried out and 8 tutors gained experience in tutoring.

In the first case problems occurred due to the absence of course integrity and inadequacy to the context of learning. In the second case the integrity of the dimensions and the adaptation of the course to student learning needs and their potential ensured a successful completion of the course. Thus, it is important to note that the analysis of the existing context should be a leading factor when choosing the degree of openness, flexibility and technological solutions.

Conclusions

E-learning, which involves new approach to learning, can be used in pursuance of transforming the study process at an institution of higher education when implementing the paradigm of lifelong learning. The study process can be conceptualised as a three-dimensional sphere: educational, organisational and technological. The characteristics of each dimension, namely, openness of learning, flexibility of the study process and the function of technologies, can be treated as measures of these dimensions.

The successful transformation of the study process requires: (i) harmony of three dimensions; (ii) adaptation of the new approach to the concrete context of studies. The adaptation is based on the principle of consistency in the introduction of innovations.

The analysis of practical cases at Vytautas Magnus University has revealed that:

- Consequent introduction to new learning culture is needed for successful adoption of the lifelong learning paradigm: wide gaps in the conceptions of knowledge, learning and teaching between designers of the learning environment and students lead to barriers in negotiating learning situations.

- The incremental construction of the learning environment and development of learning scenarios in concrete learning situations lead to a more flexible response to students' needs than the developments in international projects that are based on ideal models.
- The wider adaptation of ILT in organisation is lowering entry barriers for students. A high level transformation of an organisation is necessary for integration of the three dimensions and substantial and successful reorientation towards the paradigm of lifelong learning.

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ICT FUTURES – PERSONAL INTERFACES, INTERMEDIA PRACTICE AND THE CULTURE OF COMMUNICATION

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'The business of the computer is always unfinished. In fact "unfinish" defines the aesthetic of digital media.' Unfinished Business Peter Lunenfeld

This paper draws on international collaboration and trans cultural research. It is called **ICT Futures** and consists of two complementary sections:

1. Personal Interfaces and Intermedia Practice
2. The Culture of Communication

The art and design curriculum has its historical roots in a diverse range of creative practices and cultures. In the 21st century the computer represents a significant new contemporary tool to archive, measure, process, present and communicate using audio visual material. The internet and a related family of visualization technologies have also provided artists and educators with opportunities to reappraise the relationship between art, science and technology. It is clear that software, digital peripheral devices, used with a range of technologies are also being sampled, mixed and remixed. New hybrid communication art forms are being created, stimulating a national and international debate regarding the structure and nature of visual representation.

This paper considers the emerging technological landscape through a new methodological approach, designed to address the new challenges, electronic communications media is posing in the audio visual arts.

1. Section 1 – Personal Interfaces and Intermedia Practice

1.1 Personal Interfaces

In Peter Weibel's paper, 'The World as Interface – Towards the construction of Context – Controlled Event – Worlds' he stresses the importance of the citizen users critical understanding of their relative observation point in post modern electronic culture. It is clear that, in a visual context these (world) interfaces provide the user engagement with (i) a telematic medium comprising of (ii) technical media – both of which originated in the 19th century, through the development of (i) the telegraph and (ii) photography.

An electronic portfolio website stored on a memory card may provide new opportunities for pupil citizens to develop and exchange their coursework. Instead of eportfolio let us consider a personal (website) interface representing a lifelong diary for a citizen's creative life. As the capacity/multimedia capability of mobile phones and pdas continue to increase users are increasingly provided with opportunities to record multimedia data, organize, store, communicate and exchange, network and interact with others.

'It is clear that we are heading to a future in which pupils will carry their creative (life long) portfolios or interfaces on electronic memory cards, which will be uploaded for interaction into networked local national and international communities.

Mobile phones may be the tools that will provide the means for this to take place. The pupil-citizen will become the 'content', their information society will be open 24 hours a day and new intercultural/media forms will challenge the status quo…'

Qualification and Curriculum Association – Futures Forum Art, Design and the Information Society, http://www.qca.org.uk/futures/forum/topic.asp?TOPIC_ID=52, Pete Worrall, posted 10.3.2005
This prototype website will provide a unique identity profile of the user through its interface design. The creative application and use of this personal interface will be clearly dependant on an understanding of the new technologies that operate within it. Can this interface interact with others? – answer …yes – it is portable and can be uploaded and downloaded onto a network. It is interactive mutable data.

UIAH Helsinki and UCE in Birmingham have been collaborating for eight years through creating and using virtual learning environments, coordinating actual international ICT workshops (Portugal Brazil, Finland and England) and through developing the European Schoolnet Virtual School Art Department website http://vs.eun.org/ww/en/pub/virtual_school/depts/art.htm.

These experiences have drawn on experimental critical practice and curriculum development targeted at art educators, providing opportunities for teachers to question their teaching and learning methods. During these trans cultural partnerships and exchanges, we have explored the relationship of the 'softscape' of virtual electronic technologies and the 'hardscape' of the real life physical experiences of workshop practice.

The real (hardscape) and the virtual (softscape) provides the context of our digital research between 1997 and 2005. During this time experimental ICT curriculum workshops at UCE have created 1.8 GB of data, representing 150,000 information objects produced by 700 students. These 'Electric Studio' workshops have provided opportunities for postgraduate students to interrogate and test the potential of digital media in expanding the boundaries of visual education and provide them with an understanding of digital media in creating teaching eportfolios as personal/professional interfaces.

1.2 *Intermedia Practice*

As digital technologies have matured and become an integral part of our everyday lives, new specialist media practices have been created such as information management, digital recording, three dimensional design and visualization and interactive multimedia. The 'digital audio visual object' has become an ephemeral, information algorithm located on a network in a time/space continuum.

"Thus, instead of the world of the picture we have a universe of 'free variables' floating in specific event worlds, which can be comprehensively filled or replaced, and which interact with one another" The world as Interface – Toward the Construction of Context-Controlled Event Worlds, Peter Weibel.

The concept of Intermedia has evolved through creating 'electric studios' to meet the needs of both traditional and contemporary technologies. This experimental studio practice has been fully documented between 1992 – 2005 having been located in a range of global sites, in diverse, often challenging cultural contexts.

This diagram shows the evolution of the intermedia theoretical model

A conceptual model called ‘Intermedia’ locates these new media practices. Creative ‘Intermedia’ practice can be seen as working both ‘through’ and ‘between’ single or multiple sets of media and it is a configurable and open operational method, so it can include all media – analogue technologies, painting, ceramics or interactive timebased multimedia. The recording, reconstruction, deconstruction and transmission of information objects and their relative location on database architectures are core components of this model.

Intermedia provides an open blueprint for artists and art educators as users to identify and locate their understanding of the creative development of digital tools they are using in a range of contexts. Through Intermedia practice, personal interfaces as eportfolio websites can be developed (Section 1), however it is essential that users understand and effectively utilize the new cultures of communication (Section 2) to critically manage and craft their working environments.

The computers’ contribution to the art and design practice can be as a primary (specific) or secondary (contributory) tool. Graphic design, desktop publishing, web design, multimedia, digital photography, digital film, web based communications primarily rely to a greater extent on computer systems – (primary use). Contemporary Fine Artists, on the other hand, have adopted alternative directions which suggest a selective mix of both digital media and traditional media – secondary use, with some primary application.

‘Today it is becoming more and more evident that narrow specialization of knowledge leads to the crisis of knowledge as such. One can suggest that fundamentally new methods of knowledge transmission or mastering might solve the problem. For example, we can witness the crisis of traditional taxonomy of visual arts based on production techniques (painting, drawing, applied arts, sculpture, architecture etc.) The taxonomy grounded in different specialization of artists, typical of industrial society, becomes meaningless in the post-industrial age and does not apply to post-modern art, and even less so to the emerging information society. This is why the traditional taxonomy ignores the so-called “contemporary art” – a phenomenon that extends the limits of traditional classification.’

Education, Arts and ICTs: Integration for the Development of Personality author N. L. Selivanov Moscow 01.10.2003

Digital media technologies both reconfigure artists’ and designers’ existing procedures and practices and have the potential to create new electronic communication art forms. There is a fundamental need for existing research to be used collectively to inform national and international digital programmes and new curriculum models. This is due to the increasingly technological and scientific complexity of contemporary new media practice in the arts in providing employment opportunities in the digital creative cultural industries.

Intermedia defines a new technologically oriented postmodern practice. The craft of Intermedia practice relies on a combination of traditional subject knowledge and skills with a new technological media knowledge and skill base. The Intermedia rationale proposed below has evolved through workshop practice and cross cultural collaborations.

The conceptual matrix (below) contains the key components of a digital rationale for Intermedia practice.

INTERMEDIA RATIONALE			
← →			
Intermedia Practice One or more permutations of the 12 cells (below) may be applied in art, design and digital theory and practice – individually, concurrently, in multiples depending on the audio visual nature of the investigation/project. Effective Intermedia action involves planning and coordination combined with an intuitive critical use of both traditional and digital media in a range of environments. Note: A Critical Context: Art and Design Education on the Edge, publication / CD ROM, Tom Davies, Ellie Forrest & Pete Worrall, Cascade Publication 2003 ISBN 0-9527957-4-4 provides examples of international Intermedia practice.			
INTERMEDIA ELEMENTS			
1. Infrastructure technological requirements to facilitate digital media – fixed/mobile.	**4. Generators** technological tools (traditional and electronic).	**7. Information Object** defining the space/time resolution of the medium.	**10. Control** interactive systems – context controlled, participatory events.
2. Representation the forms available in visual culture.	**5. Recording** observation imagination memory.	**8. Hardscape & Softscape** the real and the virtual.	**11. Communication networks** global interfaces and cultural contexts including the 'digital divide'.
3. Media- 'tech' histories the development of the arts through technology and science.	**6. Incubators** developing and processing media.	**9. Database** aesthetics of information design.	**12. Personal Interface** creation/interaction of eportfolios/websites.

Exemplification of Intermedia Rationale

1. *Infrastructure* – Designing and testing new (fixed and mobile) customizable, audio visual, media spaces to deliver Intermedia. The creative design of flexible modular studio environments requires an informed understanding through prior experience of the relevant technologies.
2. *Representation* involves the craft of selection, construction, reconstruction deconstruction and manipulation of audio visual media to create and exchange different audio visible forms using visible and invisible (algorithmic mathematical/scientific) information elements.
3. *Media-tech histories* (Contextual) – contextualising the history of technological/scientific media to understand the structure of current contemporary technologies. Contextual understanding of technological tools situates visual theories and stylistic conventions at specific points in history.
4. *Generators* – selection, control and adaptation of single or combinations of traditional, electronic, digital and technological tools and recording devices to communicate visual responses.

5. *Recording* (a response), creative interaction between an idea, situation/understanding through investigating and making a response to a visual stimulus/event. This may involve a combination of observation memory recall and imagination skills.
6. *Incubators* – simulating, preparing, processing and developing specific media requirements at different stages of the creation process – for example: chemical film development, kiln firing, evaluating audience responses.
7. *Information Object* – understanding the structure and resolution of simple and complex data forms as samples for multimedia for example sound, animation, film and the still visual.
8. *Hardscape/Softscape* – hardscape represents the human interface with tactile visual spatial environments/objects and softscape represents virtual digital screenbased environments.
9. *Database* – the design and aesthetics of database information systems customized for visual archives, personal interfaces and timebased media.
10. *Control* – designing control systems to create interactive participatory events through time-based visual imaging and three dimensional virtual reality environments.
11. *Communication networks* – developing community (European) based virtual learning environments to facilitate new teaching and learning opportunities for diverse client groups.
12. *Personal Interface* – developing eportfolios as websites (See Section 1).

Intermedia in Practice

Contemporary practitioners in the post modernist age should be adaptive and adopt a critical approach to media formats – it is clear that immersive three dimensional virtual environments, timebased multimedia, the internet, micro digital devices and high powered light projectors have extended our capacity to visualize and communicate. Future professional development programmes are necessary for artists and teachers to maximize the potential of the new visual 'representation' cultures.

Samples of artists media art in the late 20th and early 21st century include, Sound and Light Installation, Electronic Public Display, Installation/website, Website with live streaming video, Multimedia Performance, Analogue TV – Feedback, Computer generated film, Computer generated hand drawn animation. Information extracted from Digital Currents: Art in the Electronic Age by Margot Lovejoy.

The PGCE ICT/Art curriculum workshops 1997 – 2005 at Birmingham Institute of Art and Design, University of Central England have secured a unique position as a centre for innovation in research and development. National and international interest in this research has resulted in publications (most recently through an Open University, Art/ICT textbook) due for release in November 2005 and invitations to deliver international papers at Belo Horizonte School of Arts in Brazil (workshop and publication 1999), Paris Prometeus (elearning conference 2002) and New York INSEA (invited seminar 2002).

In an international context the workshop pedagogical approaches have been developed in Brazil, Helsinki, Holland and Portugal – client groups BA, MA and postgraduate students. As UK coordinator of the Virtual School Art Department samples of these international workshops have been included on the European Schoolnet website www.eun.org. This has resulted in new collaborations with UNESCO through a meeting with the Russian Federation in Moscow in 2003 developing the theme of the 'development of individual personalities through the use of ICT'.

Media theorists continue to (correctly) point towards the animated time based image as the most radical challenge in 21st century visual arts. It is clear that the craft and digital alchemy required to maximize new practice and opportunities are threatened by emerging digital orthodoxies, due to software house styles.

If digital media contexts and methodologies are deconstructed, in this case as intermedia, this can provide a locus for innovation and new creativity.

2. Section 2 – The Culture of Communication

New Information and Communication Technologies (ICT) continue to extend human capabilities with regards to hearing, site and speech. This section will examine the key issues regarding emerging cultures and that of the networked lifestyle/work styles. The role and potential of electronic communication and information exchange will also be explored through case study material. Finally, consideration will be made with regards to the need for professional development, the understanding of role technology plays and the skills (in network literacy) required to maximise its use in the educational workplace.

Culture and Communication Exchanges 1997 – 2005

We are looking at this matter from a practical point of view without trying to outline a set of software and hardware. Instead we try to see why and how we are using the technology and actually focus on how technology can enhance our ability to create more effective strategies to our working and learning processes. In this paper we are focusing on educational communication culture in art education over the past 8 years in and around international collaboration and projects in the field of art education. In this collaborative sphere we have had teachers and students from more than 30 countries all over the world from Brasil to Slovenia. In the core collaborative group we have had teachers, researchers, schools museums, galleries, institutions and universities participating from around 15 countries. The view in this article never the less comes from Finnish and UK perspective mainly because of the writers' shared research interests, but also because of their leading role in these international collaborative developments.

Changing culture(s)

> Culture is a system of knowledge, believes and values, through which people build their experiences and cognition, they operate and function between different options. Culture is transferred through communication and learning. (Schouten. 2003)
>
> *"Artists have always been among the first to reflect on the culture and technology of their time, and decades before the digital revolution had been officially proclaimed, they where experimenting with the digital medium."* (Paul. 2003)

Background – Origin(s) of Different Communication Cultures in Art Education

Historically in Finnish art education and teacher training the communication cultures have divided into two very different traditions and fields of interest. On the other hand there are the art teachers who function within the traditional realm of school and those who also have double lives as artists and researchers. This divide cuts through the profession in all levels from theory to praxis.

This divide has existed in Finland almost since the beginning of art education, however in the late 1970's with the rapid development of information technology and the emergence of popular culture and their new and complex visual forms introduced yet another change into the theory and praxis of art education which eventually in the late 1990's led to the third divide. This third group of teachers and researcher had their interests in media and the contemporary arts. Since the introduction of computers new media and media art the divide in art education has only deepened both in the fields of theory and praxis. This has lead to a 3 very different and distinctive traditions concerning both views on technology and that of the communication culture.

Information and Communication Technology (ICT) is fostering development in communication by supporting and enhancing individuals' capabilities to form and foster their own reality and social sphere. ICT allows us to multiply the ways we communicate, learn and work. It is changing the global economy and it will and somewhat has already changed how we signify the existing reality. The post-modern constructivist knowledge paradigm is all about the ownership (subjective to community) and right to signify (community to subjective) the surrounding reality on our own basis. Accepting the new paradigm might be our best way forward because there is no way back to the modernistic utopia of only one solution.

New Visual Cultures Widen the Perspectives

The new popular and diverse forms of computer games, film, photography and graphic design have provided additional fields of visual culture available for the studies of young art teachers. This has led to a pioneering role in implementing these new visual art forms into the art teacher education in the University of Art and Design Helsinki as computers, film and video cameras, were made available for the teacher training as they reached the popular market. As an example the Department of Art education was the first to introduce a computerised classroom in early 1980's.

The Emergence of Cultural Industry

Eventually, these new visual art and popular culture forms together with the technology were transferred into the schools and into the teaching in most educational forms and levels. The development has lead to a birth of many specialised schools, media and film centres and art institutions. This trend was also followed by the upper secondary school development in 1980's, where almost all upper secondary schools today have special interest areas such as media, art, natural sciences, business, athletics, etc.

These developments added to the divide by supporting them and deepened the theoretical and practical divide between the art teachers and their representative traditions.

Diversity, Innovation and Change

In Finland the freedom to interpret and customise the national curriculum has led to a diversity of practice and innovation in compulsory education. At the same time, this has encouraged regional developments with a local emphasis. These developments have helped and encouraged some of the regions to develop their cultural developments through organising new media film and cartoon festivals, organising creating cultural institutions and organising local, national and international events.

It is clear that this (third) divide provides a contemporary angle on art and art education as well as contributes to the debate over '*what art is* and *what art education is for'* and this is seen as positive, complementary and necessary in the future development of the concept of art and visual education in society.

Certainly the vivid and diverse views and implementations of art teaching and practise in schools has allowed and enhanced the teacher training institutions' ability and will to explore the new opportunities. With this explorative attitude art teacher training has included media and communication studies and many of today's new media forms among the first in educational fields.

Technology as a Way to Precede Any Cultural Boundaries

We see technology and the communication networks (internet) as one of the possibilities to increase both the individual's and group's possibility to subsist and operate within the society. Through and with the technology we can expand (by observing) and change (by learning) our social reality with the potential of the virtual reality (access to information). In virtual reality we can be and become anyone we want or stay totally anonymous, the choice is ours. We can extend our cultural boundaries and the limitations stated by our social status. We can present, hide or modify our ethnic characteristics and our gender and with these possibilities the virtual reality dimension provides the multicultural realm for celebrating, learning from and sharing of our unique cultural identities.

Open Source Development Redefines the Communication Modes

When computers and digital technology developed into digital networks, the early technology developers and users saw it as an opportunity to create a parallel (virtual) reality(s) in which they could form and maintain whatever desired developments. This was supported by the free operating systems, such as Linux, which where inspired by Richard Stallmans Open Source model to produce and distribute free software. This new open source model and especially Linus Torvalds innovation opened up new aspects of collaborative, cooperative and democratic objectives in handling the technology. The basis of this new revolution was in the new and redefined communication culture. In this culture communication and information were not restricted or owned. In this culture communication only needed to control and help defining how to describe information. Information could be whatever and for whatever but it needed to be described, free and available.

Since that the Open Source development has shown the world what happens when initiatives, developments, interaction and communication, ideas and dreams are no longer owned by anyone but shared and communicated to others as free to use, welcomed to participate and supported to be used – a new truly multi-valued and open culture of handling the technology emerged to challenge the dominant culture.

Inability to Control Distributes to Diversity

Today information networks (internet, virtual reality etc.) are perhaps the only truly multicultural environments because there is no real virtual possibilities to control it. Open source developers, hackers and crackers are making sure that there will always be "another solution" to do things and enter places. There are no real ways to control anyone or any group. Because the governments, global companies, interest groups and standardisation bodies are arguing amongst themselves how to control and what to control. The only control can be done in physical world by restricting and controlling the access and use of the networks, but this is very difficult because of the global information network structure and size and ability to anonymous access and use and those of ever increasing mobile interfaces (digital TV and mobile technologies). The same structure that creates and maintains cultures and societies in the physical world are supporting the diversity in the digital reality because in the digital reality those structures cannot be controlled – yet.

Developing Our Communication Culture – Case Studies

Artists' Encounters with New Media (http://arted.uiah.fi/virtualschool/encounters)

This project brought together a teacher association's workshop "*Artist Encounters with New Media*" in a local English Art Gallery and a group of Finnish, German and Brazilian students accompanied by their teachers. The project was conducted in real-time with a teacher's workshop in which they created artwork, which was faxed and e-mailed to Brazil and Finland. After the given time (30 minutes) the artwork was modified and uploaded onto the Virtual School Art Department website.

Digital Me (http://arted.uiah.fi/virtualschool/digitalme/)

In this online workshop Finnish teachers conducted a parallel contact workshop with Brazilian students and teachers while simultaneously interacting with British colleagues over the Internet. The project was also available for online interaction during the workshop.

Art Department of the European Schoolnet (EUN) Virtual School (http://vs.eun.org/ww/en/pub/virtual_school/depts/art.htm)

The objective here is to offer European teachers, students and their organisations a web resource that supports and helps their daily work. Traditional web service with links and materials is only the beginning. We want interaction between the web resources and the users; this means developing practices, projects and web tools that allow visitors to really communicate and collaborate not only with each other, but also with the materials on the web site. So, instead of creating only end-user materials, we decided to develop materials that would help others to develop their materials and practices. By using the new technology we could offer materials and practises as tools for building something new in collaboration and interaction with others. Collaborating and sharing interest, materials and ideas are the key issue when forming something that is bigger and better than any of the given parts alone. If we are able to achieve this kind of interaction at European level, then we have something called European added value.

Online Community for the Virtual School Art Department (http://community.eun.org/entry_page.cfm?area=78)

This On-line Community was created (2000) and managed by Art teachers from the European Schoolnet Virtual School Art Department for art and media teachers across Europe and beyond. This Community is free and open for all who wish to collaborate and interact to create better teaching and learning trough art and media education. The main issue in the development of this community area was the general lack of participation in discussion groups situated in online communities.

Wholearteducationmediamatrix (http://arted.uiah.fi/virtualschool/matrix)

This project describes a collaborative online platform initiative between 4 art education professionals from 3 different countries and cultures – UK, Brasil and Finland. First introduced in InSEA New York 2002 conference *"International Conversations through Art"* as an Invited Seminar Presentation. The medium for the presentation was through a new website.

Behind the Screen 1 (http://arted.uiah.fi/behindthescreen)

This collaborative web project brought together students and teachers from Brasil, UK and Finland. Through this web exhibition the international collaboration started to collect materials and experiences for further developing the use of ICT in art education (2000).

Vapaatila 1 (http://arted.uiah.fi/virtualschool/matrix/vapaatila.html/)

Bold and unprecedented experiment of cross-cultural collaboration between UK and Finland as UK based teacher training students conducted a field practise of 7 days and set of experimental computer supported workshops in a Finnish lower secondary school in Viherlaakso Espoo in 2002. (Vapaatila. 2003)

Virta (http://virta2.uiah.fi/presentation.html)

The Virta training scheme program is based on multi-form open and distant education (ODL) study and is aimed at arts teachers in sparsely settled areas lacking formal qualifications. The studies are carried out in a net-based learning environment alongside the student's own work. The programme leads to the Master of Arts degree and its completion takes into account the students' former teaching experience in the visual arts, and training or studies in visual arts or design.

ePedagogy Design – Visual Knowledge Building (http://epedagogydesign.uiah.fi)

The purpose of MA in ePedagogy Design – Visual Knowledge Building is to improve the quality of higher education and strengthen its European dimension. It will accomplish this by encouraging the trans-national cooperation between universities, fostering the European mobility of students and teachers, and contributing to improved transparency and academic recognition of qualifications and studies throughout the European Union.

There is a growing need for visually oriented pedagogical experts such as teachers, tutors, designers and developers who are capable of community knowledge building and collaboration with other experts from different fields both from private and public sectors.

The impact of ICT is changing education resulting in competition between traditional educational institutions and private organizations. There is tremendous pressure for educational renewal as there are tensions between traditional educational delivery and new Information Society paradigms, which require different conceptual models for the teacher. To accommodate these, organizations must develop and apply structural and theoretical changes within the educational setting. The use of ICT is in the core of this change allowing the expansion of methods, materials, theories and didactics to reshape educational settings. What we should not lose is the praxis-oriented knowledge of our expertise area. This long term tradition and experience has to form the basis for the new wider approach using new possibilities offered by ICT within our professional domains. Art and Design education and research has long traditions in reflective praxis oriented methods that have emphasized the audiovisual dimension in education. (ePedagogy Design. 2003)

Summary

All technological innovations have social effects. Technology enables and divides as each culture and tradition adapts differently to emerging opportunities for change. All changes are not technological as most innovations are social in nature and therefore have communicational aspects. Realizing the information society requires changes in our communication culture. Intermedia discipline has similar aspects concerning communication cultures as it has for media practise. Operating between mediums and media requires knowledge and understanding of their traditions and cultures. Communication is the key and mother to cultures and as the cultures change so does the communication and vice versa. Failure in ether domain results in misunderstanding.

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EUROPEAN AWARENESS AND INTERCOMPREHENSION
A NEW APPROACH TO LANGUAGE AND LEARNING

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Abstract

Eu & I, the Project we want to present, whose main aim is the development of a methodology of *Intercomprehension* within the European space, assumes itself as a pioneer innovative experience for life long learning.

The main idea was born within the cooperative work of a group of researchers in Linguistics and Foreign Language Methodology from 11 European countries, who decided to get together in a Lingua 1 partnership. Since 2003, we have been developing new insights to the notion of *Intercomprehension*.

Making sense of communication situations in an unknown language is something we are bound to come across in today's enlarged Europe. Becoming aware of the strategies we make use of to improve our receptive skills is probably the best starting point to take up new languages at any age.

In this paper we will stress the adaptability of this concept to a large diversity of learning situations, both in formal and in informal educational settings.

1. Introduction

If one searches the word *intercomprehension* in any English or French dictionaries, no entry will be found. Yet, if one takes any search engine on the web, Google, for example, the number of results will be quite large (actually entries in Google search). In fact, since the beginning of the 90's, several international teams were constituted in networks working on Socrates projects and have collected theoretical and empiric data, testing hypotheses and publishing a collection of literature on a domain that is thus now quite vast. Klein (2001) who uses the term "Eurocomprehension" to refer to the existing European research and development projects, mentions 5 main groups in his review of the current *state of the art* in this field:

- The Hagen projects (Reading Courses, IGLO and Learning for Europe)
- Intercommunicabilité romane
- Eurom4
- Galatea
- EuroCom

Recently other projects have been presented and are being developed (Galanet, Euromania…).

In a recent book, *Understanding Babel* (2003), Maya Pencheva and Todor Shopov list 14 different publications about the subject, on which they offer a critical overview and comments.

All these studies seem to have in common three main aspects that support the research aims:

1. The development of multilingualism in Europe;
2. The differentiated consideration of competences and therefore the possibility to focus on a specific methodology for the development of receptive competences (cf. the *Common European Framework of Reference for Languages* that we will mention as CEF);

3. The cognitive usage of relations between different groups of languages (Romance, German and Slavic).

Yet, Eu & I, the Project we are presenting, whose main aim is also the development of a methodology of *Intercomprehension* within the European space, assumes itself as a pioneer innovative experience. Is it still possible to innovate in the field of *Intercomprehension* R&D?

2. A notion in progress

What is *Intercomprehension* exactly? The first studies about this notion, take it as the possibility to understand languages of the same family. Recognizing the valuable contributions of these studies, in September 2002, a group of researchers in Linguistics and Foreign Language Methodology from 11 European countries decided to get together in a Lingua 1 partnership: the project European Awareness and Intercomprehension (EU & I). We wanted to develop new insights to the notion of *Intercomprehension*, by applying it to a broader range of receptive situations in unknown foreign languages. Even if the aims we established at that time were not very different from the previous projects, covering two of the three main aspects we mentioned before, the way we formulated our goal shows a change in the theoretical perspective to contribute to the enlargement of language awareness in Europe through the development of a specific methodology for the learning of *Intercomprehension* (heuristic and interpretative competence in any communicative code).

2.1. Discursive competence

In the context of the preparation of Eu & I, we started from the general concept of *Discursive Competence* (or communicative competence, as it is named in the CEF)[1]. This concept allows us to focus on Intercomprehension as a process involving three different dimensions of knowledge and know-how:

- the linguistic dimension, composed of the formal features of language, i.e. phonology, lexicon, semantics, morphology and syntax. Therefore it includes the type of knowledge that is acquired in traditional learning formal contexts: phonetics, vocabulary and grammar. It is obviously the mostly well-know dimension of language, largely described in traditional linguistic studies developed through the centuries;
- the textual dimension, that includes knowledge about text, both in oral and written forms. As far as the specific written features of text are concerned, they have been described by text grammar, a quite recent discipline that aims at studying all the linguistic features that are larger than the sentence. This dimension covers verbal aspects like genres of texts, sequence types, cohesion and coherence processes, but also nonverbal features like formats and all the iconic components of a text, including the use of fonts and sizes, punctuation signs, paragraph markers, images, figures, charts, schemes… In the oral forms of texts, these visual elements are replaced by prosodic features (pauses, silences, stress, rhythm, pitch…) that punctuate the production and collaborate for the construction of meaning;
- the situational dimension, divided into three main components:
  - the socio-cultural component, which concerns the intimate link between society, culture and discourse, includes social and cultural knowledge and know-how about the universe of reference. It is the space for discourse traditions (proverbs, narratives, songs, rhymes, stereotypes, language games…), social routines and rituals (including religious and institutional language events), but also cultural icons and other signs and knowledge about specific reference fields (like science, professions, sports and leisure activities);
  - the interactional component, which is the object of interactional sociolinguistic studies the structuring rules that govern interpersonal communication, i.e. turn-taking rules, opening and closing structures in different situations, conflict negotiation, but also the non verbal features of interaction, i.e. eye contact, gestures, mimics and space management;

[1] For a detailed description of the theoretical basis of Intercomprehension, see Capucho & Cox, 2004.

- the pragmatic component deals with language and action, or, to put it in Austian terms, everything we can do with words. It concerns communication intentions and aims in everyday life, language functions and uses, speech acts, in the different contexts of human life and behaviour.

Therefore we may conclude that:

- intercomprehension processes occur inside the discursive competence as a pluricultural and plurilinguistic whole;
- they are driven by the dynamic components of the discursive competence, i.e. strategic, affective and cognitive;
- they are enabled by synergies existing inside the system. These synergies occur between different kinds of knowledge that are built inside specific linguistic and communicative systems, i.e. competence in language 1, 2 and 3 will facilitate the development of competences in languages 4, 5, 6 and 7, etc.;
- they are a result of the actual interactive use of knowledge existing in the three dimensions: linguistic, textual and situational;
- they imply both verbal and non verbal elements;
- they depend both on verbal and nonverbal features of communication.

In general terms, we may say that the innovative aspects of the EU & I project are rooted in these conclusions. In fact, they enabled us to work on two dimensions that had been quite marginal in the context of Intercomprehension studies: the textual and the socio-cultural dimensions. Moreover, the attention we put on the intrinsic components (strategic, emotional and cognitive) of the general competence let us reach the conclusion of their effective role in the construction of receptive competences.

Therefore, we could extend the meaning of *Intercomprehension* that we consider presently as *"the process of developing the ability to co-construct meaning in the context of the encounter of different languages and to make pragmatic use of this in a concrete communicative situation"* (cf. Capucho, 2004). This receptive competence in an unknown language is to be seen, not only as the result of linguistic transfer (in-between languages of the same family), *but* (and especially) as the result of the transfer of receptive strategies in the framework of *"a general interpretative process which underlies all communicative activity"* (cf. the Intercomprehension Portfolio). These strategies should be used as heuristic tools in order to fulfil comprehension tasks in any language, and learning awareness is to be based on the consciousness of their use. At this moment, further empirical research is being run in order to test our hypotheses and measure, if possible, the role of each component and of the information issued from the different dimensions in intercomprehension phenomena.

One of the main points in this innovative approach is the importance of the learner's activity in the process of understanding. If s/he is aware of the functioning of comprehension processes, if s/he actively approaches the text (in its written, oral, audiovisual or electronic form) trying to use the large range of knowledge s/he possesses about languages (her/his own and any foreign language s/he may have learnt) and about the world of reference, if s/he loses the fear of contact with a different language, then *intercomprehension* is enabled. Given this principles, it is easy to conclude that *intercomprehension* is much more a competence to be learned than a competence to be taught. Therefore this type of language learning may occur everywhere: during a trip abroad, at home, on using the Internet, watching a movie, reading a magazine or listening to the radio. In the same way, it may be developed at early ages but throughout life, at school, but also in any other social or personal context of life.

3. The Project Eu & I (European Awareness and Intercomprehension) a sensibilization to intercomprehension through ICT for lifelong learning

How do we link the research framework with concrete action aiming at linguistic awareness in Europe and lifelong learning?

If we try and develop the "receptive competence" on a constructivist basis, by enhancing the different personal skills and a strong cultural dimension that is found on the encounter of the specific national characteristics and a European general identity, the strategies that are to be used by each learner will thus depend mostly on how they are and what they already know about languages. The fundamental need of any future learner is to be aware of these facts in order to train her/himself into this active approach to language.

In order to build up a methodology for *Intercomprehension* and disseminate it around Europe, we have put ICT (Information and Communication Technologies) in the centre of our Project, both for the project partners and for the target users of our materials.

Ten subgroups have been working on EU & I producing tasks which tend to develop intercomprehension from various supports from the countries patrimony represented within the group: TV sequences, songs, literature, websites, stereotypes and multimedia.

The idea is to make European people conscious of their ability to comprehend genuine documents, facts and attitudes from other nationalities from very similar environments they are exposed to in their language and culture: time schedules for train, hotel reservation, news, popular songs, etc. Some activities are conceived with contextual aids, which are not translations but adaptations.

The main interest of ICT is the accessibility of the medium for lifelong learning and the variety of the documents that can be proposed on a site. The limit seems to be the level of what can be reached for non verbal approach, mainly for very distant language families such as Turkish or Bulgarian but it still has to be tested.

We are using two different tools:

- The official web site: http://www.usz.at/eui/ is used from the beginning of the project to disseminate our work. It is used as a starter giving the public and the group definition of the concept and a precise idea of what is expected. The website group has already produced a prototype on the themes of train booking and hotel reservation. It also gives links to other projects dealing with intercomprehension.
- The second is used for collaborative work within the group and the different teams. Each subgroup can post his work on the space which regulates the actions of the group: activities, reports so that all the groups form one community working together.

In the context of EU & I, we have been effectively using the European site community.eun.org, a multilingual interface for Cooperation Projects. In this interface, and apart a few sections of general interest (What's new, Miscellaneous: leisure, photos, …; Practical information) we have organised 10 discussion groups and forums that can be consulted by all the project members. Being used by the whole "Eu & I community", this interface allows quick and structured connections and becomes the memory of our project in construction.

The final product will be an interactive website and a DVD which will be used to store the datas not only for institutions linked to tourism or languages but to everyone who will be interested in increasing competency in intercomprehension: flexibility and adaptability on the choice of languages and on the individual construction of knowledge; creation of simulation tools and an individualised follow-up of the learning process. Our users will thus be provided with daily situation simulations using recreational but nonetheless effective activities in each of the 11 languages of the partnership.

We truly believe that ICTs play a major part both as a working tool and a structuring element for building up a collective memory. They also act as a motivating efficient help for learners: they enable the simulation of concrete situations through the use of video and audio documents and, at the same time, they allow tracking customized follow-up activities and a permanent evolution of educational materials thanks to data storage and learners' path tracking.

Computing also provides the user with educational situations leaving any kind of nervous stress or apprehension out. ICT teaching aids can supply learners with the right independent or semi-independent learning situations. Multimedia can also easily provide essential educational materials as far as nonverbal communication is concerned. Our multimedia ICT supports and tools are considered as a major "conductor" of our learning orchestra. They definitely help us in reaching the ambitious goals we set for ourselves. We hope that in the near future they will enable people to build on their individual intercomprehension competences, wherever they live and whatever age they are.

Although ICT can still be far from some people's practises, it can be a marvellous discovery when the research on the internet is linked to their everyday lifes and to what they are interested in: genealogy, history of a village, travels,… And even if some of them can be complexed of not being able to speak English, preparing oneself to understanding the other's culture is a precious ability to promote, among all if you become more conscious of the potential you already have at any age. Everyone is becoming more curious with such an approach and can then make the effort on further developing intercomprehension abilities in everyday life: is not it more a European value to promote though an individual experience beginning on the net in an attractive way?

4. Conclusion

Will Eu & I be a successful approach to language and learning? Will our intentions be valuable for the enlargement of Lifelong Learning, the development of language awareness, the increase of language skills in Europe and therefore the respect for intercultural values and diversity? Building a European intercomprehension culture leading to the development of effective multilingualism at any age, in any country, is what we aim at. In order to attain our goals, our commitment is fundamental, but also the support of all who have read this paper and share our beliefs. Here. Today.

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OH DEAR, WE DISAGREE …AND WE LOVE IT! HOW CYBERCOMMUNITIES CAN BRIDGE THE LITERARY DIVIDE

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During the last decade quite a few scholars forecast the end of the traditional reading culture.

Birkerts started this book bashing by his warnings in his *Gutenberg Elegies* (1994), proclaiming the death of the book, literature and reading due to the arrival of the electronic media.

Johnson (1997) stated in *The Interface Culture* that a new medium has to be developed whenever the existing media can not respond to the representational demands of new narratives any longer, indicating not only outdated media but also outdated narrative discourses. E-books would replace the paper equivalent. This all led us believe that print culture was about to die. Yet there is a dynamic reading culture to be found in reading groups, according to Hartley (2003). Reading groups are glocal, they are most often neighbourhood based and bring the global themes into that place.

In this paper we follow a reverse trajectory in defending the idea that instead of threatening the future of print books, digitization will guarantee their future because it offers adult readers a new opportunity to increase their literary competence. To prove this we will first discuss the origins and nature of the literary divide. Then we will discuss the characteristics of the reading group. We will link this to the middlebrow concept and finally we will propose a concept of a virtual reading community. But first we will have a look at the virtual reading opportunities that already exist in Flanders.

1. Flanders on line reading

Suppose you are an avid reader and you want to share your reading experience with other readers. You google *Leesgroep + Vlaanderen (reading group + Flanders*) and what do you find? Not a single reading group.

Now just to make sure your request is nothing out of the ordinary, you pretend you live in Wales (which I want to if only I could, and there you go): 19 reading groups are presented with contact information on the BBC – NorthEastWales site (1), you are helped by Random House (2) that links you to bookgroup.info (3) where you can find recommended books, an advice page, a forum to talk about books or book groups. The forum also allows you to announce if you want to start a book group in a particular area and there is a lovely introduction to the reading group members to boot.

Now back to Flanders. There are three agents who want to promote the culture of reading groups. The Flemish government developed a regulation for reading groups (4) in 2001. *Stichting Lezen* (Flemish Literacy Trust) (5) and *VCOB* (6) (the umbrella organisation for public libraries in Flanders) are strongly committed to the reading culture. In 2002 *VCOB* started a forum on reading groups (7) and in June 2004 they set up a survey to map the library affiliated physical reading groups with a focus on reading groups for children (8). *Stichting Lezen* gives a thorough description of the Flemish reading scape. In it we read about the 90 physical reading groups organised by *'Het Davidsfonds'* (9), a reading community (10) discussing which book to read, a bookshop (11) announcing 8 meetings for readers, a Flemish equivalent (12) for bookcrossing.com. and a few famous people who talk about their book of preference on the site '*everybody reads'*(13) Both organisations offer training courses for the leader of a reading group (14). And finally there is a James Joyce reading group in Antwerp (15).

2. Literary divide

In those reading spaces you can perceive an oscillation between two reading modes, academic and non academic, and a preference for a focus on the text in most situations and for the reader in the James Joyce reading group. We use the concept of literary divide to indicate the gap that exists between these two ways of reading, between reading in a scholarly way versus reading in a book club for instance. We hypothesize that bridging this gap is the ultimate challenge to improve the literary competence which in its turn will encourage literary reading.

Travis refers to the increase in the publications of books and newspapers at the beginning of the eighteenth century to explain a new reading culture. Readers started to read voraciously all kinds of texts. This worried the literary critics who were vexed by this unpoliced reading referred to as promiscuous reading, cruising, philandering, or extensive reading which contrasted with the intensive mode of reading: "read, recite and memorize a narrow body of sacred texts" (Travis 3). In this context Johann Bergk developed a method of reading resembling new criticism which became popular in the 1950s. According to new criticism the text should be the main object of our focus, the reader is a passive receptacle. Affective (including the emotional effects on the reader in the analysis) and authorial fallacy (including the author's intentions) made sure the text remained the sole object of our literary attention.

Knight on the other hand refers to the nineteenth century and the influence of the romantic movement that caused a focus shift from reader to author and the naissance of new criticism to focus on the text only and to exclude the reader totally. Contrasting with this we have the reader-response theory from the 1970s onwards which focuses on the reader. Knight distinguishes between *the reader in the text* (the meaning lies in the text), *the reader as text* (the meaning lies in the reader) and *the reader and the text (the meaning is in between the reader and the text)*. Structuralism (the reader in the text) differentiates between the historical reader and the narratee who is a construct in the writers mind. It is the reader in the text to whom the narrator is telling the narrative. Secondly it sees 'the text not as an object in space but as an experience in time' according to Stanley Fish, which allows the reader to change his interpretations because he continues reading, gathers new information.

Whereas Prince and Fish see but one reading experience for all readers of the same text, the reader as text (psychoanalysis) see as many interpretations as readers per text. Bleich focuses on the group experience where readers convene and share their individual reading experience and then negotiate one group interpretation. Holland points at the identity theme that every reader brings into the text and shapes his reading. In phenomenology (the reader and the text) Wolfgang Iser points at the tension between the individual readings by filling in the gaps of literary texts and the one consistent meaning of the text itself. Poststructuralists Roland Barthes and Judith Fetterly introduced the resistant reader adding context to the texts.

Both modes coexist in literary scholarship as Hall concludes. He sees two streams:

One encompasses those of us who, practicing the history of the book as it has emerged out of the intersection of the histories of printing and publishing with the social history of culture, attempt to construct patterns of actual consumption by groups we conveniently name "readers"; and another encompassing those in literary studies who are primarily concerned with authorship and the hermeneutics of interpretation. (Hall 187)

3. Reading groups as interpretive communities

Reading groups can be seen as interpretive communities, a phrase coined by Stanley Fish, that accounts for both the diversity (Fish) in reading experiences as for the longing for one similar interpretation among readers with different identity themes (Holland). Reading groups can be seen as a counterculture where the readers proudly assert their right to reading in their own way. Reading groups define themselves as non academic readers.

This readers' conversation apparently consists of a merger between the lives of the readers and the life of the book. A reading group seeks connections between the group members, the group and the books and finally between the group and the wider world.

In Hartley's (2003) study there are several references to the quest for quality in reading groups. For instance we learn that reading groups don't want to use reading guides as they "are issued by the marketing and promotion departments, not by the editorial departments" [4, p. 99]. Reading groups also embed their reading sessions in "a rich framework for their discussion through reference to other books, films, and social and political issues" [4] (Huion 2005).

4. Middlebrow

Yet reading groups were often patronised as they were seen as marketing tools targeting housewives. Travis notes that at the beginning of the twentieth century middlebrow book clubs mushroomed indicating the transition from book production to book consumption. Book club members, she argues, read informative book report instead of critical reviews. In doing so they could even skip the actual reading of the book.

Radway (2003) however draws our attention to the importance of middlebrow culture between 1880-1925 as an interface between specialist knowledge and educated general readers who wanted to be informed about the rapidly changing world through summaries, handbooks, literature. Book of the month clubs and literary reviews were commercial organs obviously and they addressed the middlebrow's need for immediate information. However these transition channels were avoided by the academic and literary writers who retreated in scholarly journals and small magazines. Radway states that in doing so literary writers and academics created a space for middlebrow mediators instead of using these spaces that allowed them to link their expertise to the information need of the general audience.

But then there was an educational paradigm shift from classical learning where you had to master truths, canons and tradition, to research-based learning. Academics had to be able to fund their research projects and that is why they had to communicate their results in popularized versions in magazines and books for the educated general audience.

In this context it were the book clubs that provided a communication platform for literary specialists and the educated general audience allowing the latter to improve his literary competence. Indeed, book clubs and middlebrow readers or as Virginia Woolf calls them 'a community of common readers' played an important mediating role to rescue literature and its readers from oblivion.

5. Virtual reading communities

We argue that virtual reading communities can take this process one step further. A step which is being dreamt of by many a scholar.

5.1 A demand for change

"Can we hope that some day these (literary) critics will interest themselves in the social history of production and consumption, and, conversely, that social historians will acknowledge the power of texts?" Hall wonders (Hall 187).

Travis regrets that the university-based English professors still despise the middlebrow culture and warns that "unless humanities faculties and specialists learn to address a broad, general audience and to make a case for the knowledge they offer, they will be replaced by departments of communication and media studies". (Travis 119*).* She puts forth a strong case for the "construction of cultural empathy for the construction of cultural empathy and for instruction in cultural interpretation, which would involve readers in a fusion or linking with other cultures, a non violent relation to the other, followed by a separation and contemplation of the experience of merging – (as) the necessary next stage in reading cultures" (Travis 133). She refers to Suleri's 'hollow pockets' where different cultures meet temporarily and to the ethics of Cornell who describes reading as a non violent relation to the Other making sure you respect her difference and singularity. Travis hopes that ICT will make this kind of reading possible.

So let us have a look at what is possible on the internet as far as literature goes. Schreier (1998) differentiates between spreading of texts and information about texts. She discusses four types in the first category: digitalised literature, singly authored hyperfiction, collectively authored (hyperfiction) and docuverses. These docuverses start from digitalised text. Then everybody can add their own texts, commentaries and hyperlinks.

As to the information on texts she concludes that on the one had theer is more information on literature to be found on the internet than in traditional sources but you have to spend a lot of time to find all the information.

5.2 A new learning concept

Our concept is strongly related to Schreier's docuverses and combines three of Carlén's types of online learning communities: blended educational communities (BEC), blended professional communities (BPC), and blended interest communities (BIC). On top of that it is a medical remediation of the physical reading group. As Ryan (2004) explains medical remediation is a remediation that makes better, writing made speech more permanent for instance. Finally I will apply the physical and aesthetic characteristics of the digital media as explained by Murray (2001). According to Murray digital media are both interactive because they are procedural and participatory as well as immersive because they are spatial and encyclopaedic. These characteristics allow us to create a new aesthetic for digital media through immersion, transformation and agency.

Thus the virtual reading community is a medical remediation of the physical reading group in that it combines both reading modes, focus on text and context. It is a place where all readers whether they are teachers, academics or common readers will convene, and can contribute scholarly texts, reading diaries, commentaries. The common ground are digitalised text and personal stories. Fora can be moderated by either a literary specialist or a common reader. Preferably all literary source material are hyperlinked to the community site. The reader can move from one room to another, each room representing a reading mode. Readers or reading modes are not labelled as high, low or middlebrow, they are just different. The reader decides and in doing so he can choose to diversify his reading mode or not.

In doing so we re-establish the link with the forms of oral reading which was the dominant mode of reading before the sixteenth century in adding other readers in the public space. We also re-established the link with Barthes' prediction that "the objective of poststructural reading and blissful texts was to transform readers into producers rather than consumers of texts, he accurately predicted the kind of reading necessary in a cybernetic world" (Travis 130).

6. Conclusion

Today there are still two dominant modes of reading being put into practice. These two rivalling modes alienate the majority of readers and cause the decrease of the literary competence in general. Medical remediation allows us to bridge the literary divide and gathers all readers indiscriminately allowing them to access literary sources fluently.

Online reading groups

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2. http://www.bookgroup.info/
3. http://www.randomhouse.co.uk/readersgroup/toptips.htm
4. http://www.wvc.vlaanderen.be:80/letteren/nieuw_reglement_leeskringen.htm
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8. http://www.villakakelbont.be/html/nieuws/nieuws_detail.asp?id=470
9. http://www.davidsfonds.be/
10. www.boekenforum.be
11. http://www.groenewaterman.be/
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QUALITY FOR E-LEARNING-REGIONS
SUPPORTING LIFELONG LEARNING ON A REGIONAL LEVEL

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1. Introduction: E-Learning Regions as an Innovative Concept

In this paper, we provide a method to analyse, compare, and benchmark the quality of Learning Regions and suggest dimensions of quality for E-Learning Regions. The concept is applied to the E-Learning Region Ruhr in Germany as an example of an E-Learning Region.

Learning Regions as a concept aims at improving the performance and potentials of a region in terms of knowledge building and participation of the citizens in an active society. E-learning can improve this outcome by providing better and more flexible training opportunities. In the context of Learning Regions e-learning represents both: A condition and a cause for change. Great expectations are connected to the introduction of new technologies to regional and organisational learning processes which yet fail to take effect. These potentials, however, rely on synergies which can be realised if actors in a region start interacting with each other, build sustainable networks and thus create win-win situations.

Yet, there is no concept for analysing regions in terms of their achievements and status as a learning region and utilizing the potentials of e-learning. This is necessary to find optimisation potentials and develop supporting policies. To compare and analyse different regions we suggest an analysis grid. It is based on the multiperspectivity which has to be taken into account for concepts like Learning Regions. Additionally, we connect this purely analytic tool to values which represent good practices in a functioning Learning Region. These are taken from a benchmarking system specifically developed for E-Learning-Regions.

2. E-Learning Regions for Lifelong Learning and Community Building

In this section, we discuss the different perspectives on Learning Regions and introduce the concept of E-Learning Regions. What is *learning* in a region and what is a *region,* is not commonly defined in the literature – what *regional learning* is and who is actually *learning in a region* is also left in the dark. Learning Regions are defined from different perspectives and within different contexts – the definitions do not focus on precisely working out the actors or the regional space. They are rather focussing on the benefits of supporting education – not only from an individual or an organisational point of view but from a regional position.

One position defines Learning Regions as the current and future human capital of a region (see Blessin (1997) and Schläger-Zirlik (2003), for the concept of human capital also see Bourdieu 1982). Oinas and Virkkalla (1997) characterise Learning Regions as interorganisational learning processes within a certain geographic boundary, enabling learning and training. Thus, Learning Regions become an organisational objective in the economic development of enterprises. One has to note, however, that learning is always concerning the individual activity, as the smallest entity of regions. It is therefore always the individual subject which is benefiting from learning processes – be it on organisational or regional – i.e. interorganisational – learning.

The meaning of Learning Regions varies in Africa, America, Asia, Australia and Europe (For an overview about the different concepts worldwide of learning regions and societies see Coffield (2000)). Especially in Europe, the necessity of combining the competitive knowledge economy on the one hand and social cohesion on the other hand is emphasized (Walters/ Etkind 2003). The growth of knowledge and competency building are seen as the basis for innovative businesses to ensure long-term competitiveness, leading to the need to establish a culture of interactive networking and living communication. This also includes the need for lifelong learning and community building. At the regional level they are supported strongly by the economic changes within the relationship between state and market towards a network paradigm (Morgan 1997).

Promoting the potential of human (and social) capital, the European Union has changed the strategy in regional development towards a concept of innovation by networking. During the transformation processes towards the knowledge society regions have gained more importance against nations. Organisations and enterprises build focal points for knowledge production, usage and learning processes (Florida 1995).

> *We define Learning Regions in a broader sense: Learning Regions are both, all learning processes on the individual, organisational and society level as well as all educational dimensions of learning systems in a specific regional environment.*

Learning processes are always embedded in their social context: there is no deep understanding of learning without the institutional and cultural context. In the fields of regional economic development a new view has been established where knowledge becomes the most important resource and learning the most important method (for a detailed description for the changes see Asheim/ Isaksen 1997). That is why lifelong learning is not only a demand for certain situations and employees, but a common need for all stakeholders within a Learning Region. Lifelong Learning ensures the continuous adjustment to the needs of a world of faster development and changes.

E-learning, and Information and Communication Technologies in general, add new possibilities to Learning Regions but also present new challenges. Improvement can take place in various aspects, such as: Communication, Coordination of educational activities, re-use of learning scenarios and sharing of resources, regional market-places for education and training, providing flexibility and individualization. Challenges have to be met at the field of digital divide, building access opportunities for everyone and developing digital literacy for all citizens.

E-Learning Regions can be seen as Learning Regions, strategically and operationally utilizing Information and Communication Technologies to improve educational processes on regional level. However, utilizing E-Learning as a regional development tool requires elaborated planning. All stakeholders must be involved and committed to reach these objectives. A first step to develop a regional development plan is an analysis of the E-Learning Region, taking into account specific aspects of E-Learning on different levels.

3. Quality Dimensions in Learning Regions: An Analysis Grid

There is no general quality concept for learning regions. Specific contexts and environments lead to different quality objectives, policies, and strategies. To identify the context and to develop regional quality objectives, we suggest an analysis grid providing a common reference frame for the assessment of structures in a region.

For a thorough analysis of regions it is important to distinguish between five dimensions of learning regions which play an important role for learning processes in regional contexts. These levels are not complete distinct from each other but rather offer orientation for the analysis of important aspects: (1) Level of Culture (preconditions and history), (2) Level of Policy (education and social policy), (3) Level of Learning Processes (formal and informal conditions of education, e.g. institutions), (4) Level of Content & Didactics (learning resources and learning scenarios), (5) Level of Technology (technologies and tools) (see Table 1).

These five dimensions can be analysed on different levels: (1) The *Macro-Level* which represents the society, (2) the *Meso-Level* which relates to organisations, e.g. the educational system (general/basic education, higher education, vocational education, continuing education) and (3) the *Micro-Level*, representing the individuals in their socio-economic environment (policy makers, teachers, learners, managers, parents, developers, content providers, professionals, multiplicators/intermediaries, etc.).

In every analysis dimension and on every level it is important to analyse the so-called aspect of relevance. This relates to the extent of influence which can be analysed: local, regional and/or national, resp. international influences. The described analysis grid is capable of analysing learning regions in respect to 15 different aspects.

Table 1 shows the analysis grid. Within the table, the state-of-the-art in the region should be described. Additionally, the grid can be used to identify quality requirements and objectives for each field. In our example, the quality requirements of a benchmarking system for E-Learning Regions are integrated into the analysis grid. They were developed in the frame of a European project[1] to compare the status of regions with respect to their e-learning-readiness. The grid thus can be used as a reference point for analysing the quality of Learning Regions and to specify requirements, objectives, and instruments.

Table 1: Analysis grid for e-learning-regions

Scope Dimension	Macro-Level (Society, Regional Focus)	Meso-Level (Organisational Focus)	Micro-Level (Individual Focus, Population)
Cultural Dimension (Society development)	System to assess the relevance of the e-learning initiatives for the social and labour market needs and societal development	Measure to support the development and piloting of new initiatives and organisations in e-learning networking within the regional context	System to track and to collect statistical data on the behaviours of the learning population Systemic approach to collect feedback and suggestion from customers/citizens
Policy Dimension (Policy development)	Document which defines the approach and the policy on e-learning in the regional context Document which makes explicit the link between e-learning regional policy and an implemented quality approach	Measures which support and promote new partnership developments between organisations in e-learning within the regional context	Involvement of the different individuals and stakeholders in the e-learning policies within the regional context
Process Dimension (Learning Organisations)	Measures which support external and internal relationships among e-learning providers within the regional context Amount of "certified or accredited" e-learning providers out the total regional Learning providers N. of networks of organisation active in the Region to develop e-learning products and other services and proportion to learning provision developed by networks of organisations rather than simple institutions or enterprises	Tools for monitoring costs related to e-learning actions and materials in organisations Quality frameworks (principles, standards and tools) to assess the e-learning providers capability Implementation of Quality framework (principles, standards and tools) PR management system N. of participation in e-learning initiatives at international level N. of organisations in e-learning multiRegional projects	Tools and procedures for assessing outcomes of the learning process N. and Amount of participants in e-earning actions out from the total number of participants in education and training initiatives Amount of the drop-outs from e-learning courses N. of professionals active in e-learning provision
Content & Didactics Dimension (Educational Scenarios)	N. of e-learning products from the region used outside the Region	Quality frameworks (principles, standards and tools) to assess the e-learning resources N. and amount of course in e-learning N. and amount of products certified and accredited on the total material provision	Amount of e-learning provision specifically targeted to disadvantaged target groups
Technology Dimension (Infrastructure)		Technical infrastructure extension and capacity Interoperability and compatibility standards for the delivery of e-learning Initiatives	Ration of persons with access to e-infrastructure

4. Learning Regions in Practice: E-Learning Region Ruhr

In this section, we provide an example of a Learning Region, analyse certain aspects according to the presented analysis method and show actions to improve the regional cooperation.

The E-Learning Region Ruhr is located in the Metropolitan area of the Ruhrgebiet in Germany, an area with a population of about 7.5 million people and a high density of educational institutions on all levels. In accordance with good practices for Learning Regions a strategic policy for the Learning Region Ruhr was established. The development plan for the Learning Region aims at the following strategic objectives:

- *Knowledge Transfer*: A Learning Region highly depends on knowledge transfer across all levels of learning, education and training. Providing concepts and practical support for this transfer between all institutions and stakeholders is crucial for the success of the region (Process Dimension).

[1] http://www.eifel.org/seel

- *Innovation*: Learning Regions are competing on the global market. Promoting innovations (e.g., through efficient knowledge transfer from universities into educational institutions) will lead to competitive advantages in the educational market (Process Dimension).
- *Compensation*: A Learning Region consists of stronger and weaker organizations. In our case, specifically schools and vocational training providers need support concerning the use of innovative learning technologies (Process Dimension).
- *Positioning*: Traditionally, the German education market is characterized by small and medium enterprises. To compete in the European and global market they must combine their potentials and competencies to provide a larger portfolio to meet the demand of customers (Process Dimension).
- *Impact on the Society*: The success of a Learning Region is not only the SUM of (business) success of the organizations. The impact on the society (e.g. percentage of population with High School degree, percentage of High School students entering Higher Education) is an important criterion for the success of a region (Cultural Dimension).

The analysis shows that the strategic objectives were mainly based on the improvement of the *process dimension* (organisations and institutions) and on the general *cultural level*. Based on these objectives, a three phase concept was developed to initiate the e-learning-region Ruhr: Analysis and Initiation, Local Networking, Regional Cooperation.

4.1 Analysis and Initiation

The objective of this phase was to analyse the state-of-the art of the region concerning E-Learning. The process-, content-, and technology dimension of the analysis grid (Table 1) were used in an extended version for the analysis. In the analysis the (organisational) competencies, educational products and services on all educational levels were detected.

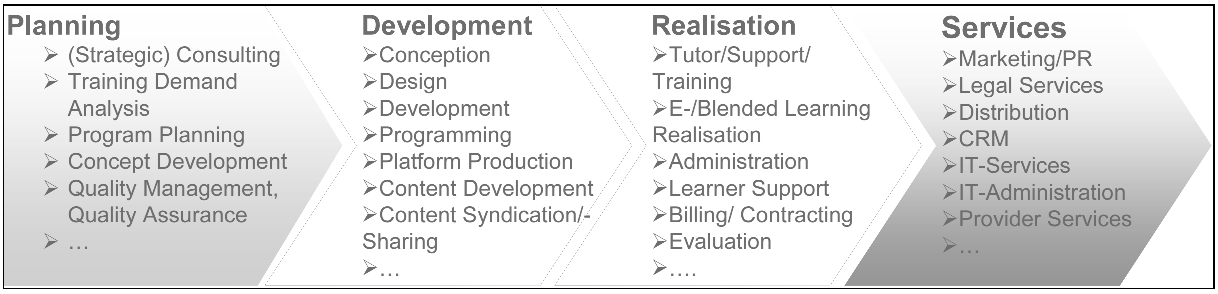

Figure 1. Analysis Categories

Additionally, the regional distribution of actors in the field of e-learning was analysed. As an example of the regional distribution of actors, the following figure shows public educational organizations.

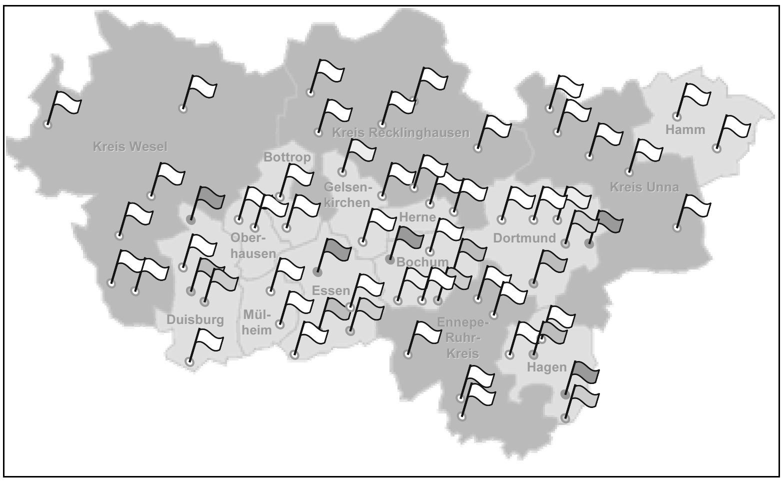

Figure 2. Public Educational Organizations [Projekt Ruhr, 2004]

The analysis framework shows the main players of E-Learning and leads to increased transparency. Additionally, it serves as a base for identifying strengths and weaknesses and to improve cooperation. The result of the analysis is a Regional E-Learning Portfolio, the E-Learning Map Ruhr, consisting of actors, their competencies and potentials for cooperation.

4.2 Local Networking & Regional Cooperation

Establishing a network highly depends on the involvement of the participants – from the beginning, benefits must be visible for the partners. However, even though e-learning is obviously not dependent of the location, we have seen that organizations still need local references. Therefore, the network was started with local activities. In a second phase, the network will be extended connecting the local nodes towards a regional network (Process Dimension: Macro Level, Good Practice Recommendation) (Figure 3).

The approach has been very successful leading to extensive cooperations between local partners on all levels. However, the regional cooperation is still being established and needs to be evaluated in the next months. Establishing a Learning Region is a long-term task. In this sample, we have shown the first steps which prepare regions for a long-term development. Specifically, the analysis and networking need to be structured, planned, and evaluated continuously. However, using the analysis instruments we have proposed in this article help to establish Learning Regions successfully.

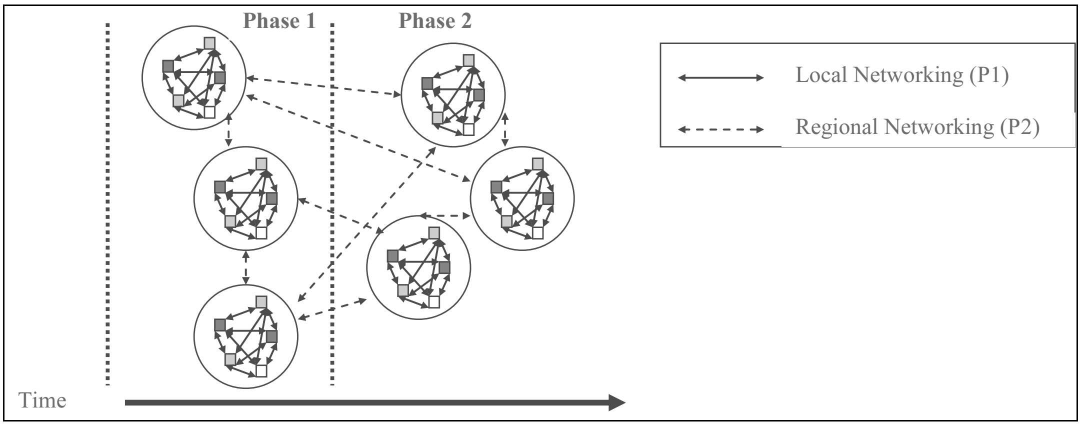

Figure 3. Developing Networks

5. Conclusion: Learning Regions for Sustainable Development

The performance and potentials of Learning Regions can be improved by utilizing E-Learning. However, a well elaborated planning is necessary on strategic, tactical, and operational levels. We have suggested an analysis grid for E-Learning Regions as a planning tool. This tool should be used to analyse Learning Regions and to develop objectives and instruments for regional development. It is important to pay attention to a balanced strategy. Objectives should be formulated for all dimensions which make up a Learning Region because Learning Regions aim at development and growth on all levels. This includes policies, organisations, individuals, and infrastructures. It is important to note that the impact of measures aiming at a specific level will also influence other regional processes. Therefore, a thorough planning can significantly improve the development of Learning Regions.

In the presented example, the E-Learning Region Ruhr, the analysis was extended to identify portfolios of organizations to identify cooperation potentials. As a second part, a complex network was structured and implemented in different phases, based on the analysis. It was emphasized that a careful, structured analysis influences regional development in general, and also in specific actions – such as network building. However, more experiences are needed to predict the potentials of E-Learning Regions on all levels.

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e-QUALITY: TRAINING TEAMS TO IMPLEMENT QUALITY IN ODL AT UNIVERSITY LEVEL IN EUROPE

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Quality: a need for improving ODL development in higher education

Quality assessment is becoming a strategic issue for ODL (Open and Distance Learning) service providers and users. As the market for ODL services is opening up in Europe the number of ODL services in the field of higher education is growing, but end users actually have no ways of assessing their quality.

The implementation of ECTS system will facilitate a new type of students and of student mobility: students will be able pick up courses and training programmes here and there according to their specific objectives and criteria; the opportunity to attend courses in a different linguistic environment without the cost of 'physical mobility' will also attract students.

In this context it is of major importance that European universities can enter the 'competitive education market' through a 'quality approach' and guarantee that their ODL services are conform to an explicit quality standard. For university staff, it will equally be important to rely upon the quality of the ODL services proposed by other universities to validate courses followed there by their own students.

It is assumed that quality will reengineer activities, information channels and products in the forthcoming period, or in other words quality will modify the organisation's structure to incorporate the expected and needed improvements.

End users and companies looking for their staff's continuing education have the same quality requirement.

The e-Quality project: a contribution for improving quality in ODL in higher education in Europe

On going normalisation has still quite a work to do on ODL services. Nevertheless, the on going work on normalisation is mainly centred on technical issues as the interoperability of the systems; our approach is – on the contrary – centred on the learners and on the learning process.

The *e-Quality* project, partly funded by the European Commission under the Socrates/Minerva Programme[1], while deep rooted into the on going normalisation work, proposes to offer a ground for practical design and implementation of a quality methodology, a training package for staff in charge of its implementation, a validation field and a knowledge data base for results and best practice dissemination.

The pedagogical approach puts the student's needs at the root of the ODL quality process. This approach is comprehensive: It encompasses all the processes needed to validate in real situation the produced methodology and documents.

[1] Project number: 110231-CP-1-2003-1-MINERVA-M – 2003-2006

The *e-Quality* project starts with the comparative analysis of the partners' context that permits to be aware and detect a set of existing blocking factors in the implementation of quality. Different approaches from different scenarios were the base for the development of a common model; 'The Student Life Cycle'. It aims also to build a methodological guide based on an abstract model of the ODL quality in Europe. This conceptual model contains a common reference and variations core appropriate to the cultural countries context of the project partners.

In the frame of the *e-Quality* project, through a collaborative work a set of criteria and indicators are being developed. The idea is offering guidance enhancing the improvement of ODL higher institutions in quality terms. Furthermore this information may be considered as key success elements when implementing quality methodologies.

The project supplies core methodology and tools, as well as accompanying interactive documents and resources (guidelines, best practices, models...) which explicit the use of the methodology and tools. Our references are mainly the EFQM model and partly the norm ISO 9001, in its version 2000, as it is applicable to services and focused on 'clients' satisfaction'.

It produces a training package to train, in face to face and at distance, several teams of concerned staff (both trainers, technicians and administrative, with students as observers) to understand changes, to use the resources and apply the methodology. We focus our work on training teams working in ODL as we agree on the need for an institution that has to develop ODL to organise its ODL service on a collaborative base between all actors concerned: teachers but also technicians and administrative staff.

The methodological guide is exploited to build supports to form the teams FOAD in the quality, to experiment these supports in actual ODL training, to estimate his efficiency during the actual implementation of the quality by experimental ODL teams (with at least one 'team' in each of 5 partners' Universities). In every stage, the guide is revised to take into account the training sessions and observations results of the experimental teams implementing quality in the ODL. The test results are re-invested into the project production process, to adjust the methodology and the core documents.

A political European vision

As European Universities have a key role to play in on normalisation and quality, it is important not to leave the leadership to North American organisations. The communiqué of the Conference of Ministers responsible for Higher Education in Berlin 2003 is the corner stone of this construction and give us the background of our project. One paragraph is dedicated to 'Quality Assurance'.

The Ministers declare first that "The quality of higher education has proven to be at the heart of the setting up of a European Higher Education Area" and they "commit themselves to supporting further development of quality assurance at institutional, national and European level". The first issue the Ministers stressed is "the need to develop mutually shared criteria and methodologies on quality assurance".

The Ministers fixed a very precise agenda, arriving at its first rendezvous this year 2005. During this year our national quality assurance systems should include:

- A definition of the responsibilities of the bodies and institutions involved.
- Evaluation of programmes or institutions, including internal assessment, external review, participation of students and the publication of results.
- A system of accreditation, certification or comparable procedures.
- International participation, co-operation and networking.

e-Quality project: in line with the Berlin Communiqué

ODL, as part of the teaching activities of some higher education institutions, must follow the same rules. Our project is directly addressing theses four issues above:

1. ODL is not an individual project, managed by a sole teacher; it implies that all the 'student life cycle' is focusing on the student's success, starting with the welcome and advise before the registration to the exam assessment, through all a tutoring and monitoring follow up. Such process involves several bodies and needs several roles to be played by teachers, administrative and technical staff. This point refers also to a basic requirement of norm ISO 9001: management of the organism must be engaged in the quality step.
2. Our project includes a training session of teams – at least one in each partner's country-responsible of development and delivery of an ODL course to implement quality in 2 sub-processes (resources production and student support). The way these teams will apply their new competencies in quality will be evaluated later on, including the participation of students.
3. We define quality indicators and criteria to measure quality implementation in the 2 sub-processes mentioned above, practical and adapted to the different possible roles played in the teams.
4. The international partnership allows us to build a representation of the sub-processes – called e-Lup – based on a comparative approach of models, associated with a Best Practices database. We also elaborate an analysis of the situation of quality representation and implementation in our 5 countries, including a synoptic table of blocking factors from the different cultural and organisational environments.

Within the project, we keep aware of the evolution of norms and standards in the quality field as well as we keep in touch with the other European projects working in the same area as EQO (European Quality Observatory) project.

Intercultural approach

The project tries to conciliate an apparent contradictory goal. It should try to build a global vision, with the risks that standardisation of processes could flatten the original vision of the 5 different countries which take an active part in the project. Every country has its own vision, its own characteristics, its own goals and attends for an efficient e-learning application. Thenceforth the leaded researches within the project have to be organised to smooth the whole e-learning process without excluding the countries particularities and cultural specificities.

To fulfil this objective different measures have been taken:

- Develop every project's block integrating a participative, collaborative approach. Every participant is asked to get involved into every work package and has to give his own vision of the current developed tasks. This has a strong impact on the project, with sometimes difficulties and pulling that enrich the whole project vision.
- Use of a common platform to exchange resources, remarks through forums and directories.
- Implementation of a survey gathering different countries' e-learning policies.
- Switzerland (HEVS) is in charge of collecting and pointing the specific intercultural nodes, contributions and inputs particularly during the future training session testing the e-quality method.

The consortium intends to build a coherent vision including a horizontal method based on the systemisation of collected best practices and introducing vertical elements belonging to cultural aspects. The systemic vision that underlies the project helps not to move away from the initial objective: include differences without erasing it.

The national environment: cultural and organisational issues

National studies have been conducted in the 5 countries and reports have been written on the situation of quality implementation, especially in higher educational institutions, including cultural and organisational factors able to influence such implementation. They also gather statistical data e.g. on rates of equipment and access to Internet.

The analysis of the national reports show some similarities, for instance, in the evaluation process of universities, which can be seen as a favorable factor for quality implementation:

- a compulsory process in all the countries;
- a process defined by the state;
- a process including a national agency;
- internal & external evaluation;
- quality is an explicit or implicit objective.

In terms of blocking factors, some of them are common to the 5 situations, for instance:

- high focus on teaching instead of learning;
- to design quality ODL material is time consuming;
- the quality system is not integrated in the management system of the institution.

But some other are concerning only some countries but not all:

- lack of technical assistance for the staff (Fr, Pl, Sp);
- 'you can teach face-to-face when you know the content, and you can teach at distance when you can teach face-to-face' (Fr, Pl);
- teachers are reluctant to be evaluated (Fi, Fr, Sp, Sw).

These similarities and differences will be taken into account when preparing the training material.

The 'lifecycle student' model

After considering 5 European country scenarios plus the state of the art underlined by the EFQM and ISO background, from different approaches 'The Student's Life Cycle' was obtained. The model considers the student needs in a timeline, from the very beginning until the end of the training actions and it is focused to facilitate the optimisation of quality in two senses. On one hand the maximisation of student's satisfactions with a wide range of issues such as communication with counsellor, tutors, peers, administrative and technical staff etc., or having excellent learning materials, educational resources, etc. On the other hand 'The Student's Life Cycle Model' contributes to establish key success recommendations through a set of quality criteria and indicators for the learning effectiveness. In this sense, another remarkable output is the elaboration of charts that interconnect four main categories, which are roles, activities, artefacts and additional elements. The idea is to show how to face actions, in quality terms, for the continuous improvement of ODL trainings.

The e-Lup editor

Conceptual model is materialised by a general quality process charter, references to norms and standards, a data base of good practices, and a methodological guide of the e-learning quality process. The guide supplies to every actor (the tutor, the author, the administrative staff, the financial staff, the technical staff…) a common methodology and specific guides in their activity. These various resources – guide, charter, norms and standards, good practices are linked together to facilitate a global point of view. Cultural variations are also indicated. The methodological guide is implemented in an interactive document named 'e-LUP: e-learning Unified Process'.

The name 'e-learning Unified Process (e-LUP)' was chosen by analogy with the Unified Process, implemented in Software engineering for the software development [Jacobson and al. 1999, RUP 2003] based on the modelling language Unified Modelling Language (UML) [Rumbaugh *et al.* 1999].

The modelling language is very general. As in RUP, activities, roles, artefacts and workflows are used. Activities are described by step by step procedures, artefacts (input data and output results). The modelling language fits our needs: to describe a concrete implementation of a general quality approach. The e-LUP editor is a collaborative editor helping users to capture and to validate roles, activities, artefacts and workflows.

The Best Practice database

The objective of the best practices database is to offer e-learning designers and developers some references and examples of successful implementation – in term of Quality – easily adaptable and reproducible in other contexts.

A 'best practice' can be seen as an efficient solution to a problem encountered in e-learning or an improvement issue. It has been implemented and positively evaluated, demonstrating an effective means of satisfying the users' need, based on explicit Quality indicators. The user may be a student, a trainer, a tutor, or any stakeholder. To be useful, a 'best practice' must be described in a way an external reader can understand the context, the conditions of implementation, and receive advice on how to implement it, the needed resources, on what difficulties have to be solved, and how to do it, and what advantages are gained for the different users. Difficulty here means the specific situation that may appear when implementing the 'best practice' and that must be anticipated. For each difficulty at least one solution must be available. The advantage refers to an effective solution to a problem widely encountered in e-learning or to an effective improvement.

The training sessions

The main objective of the training materials produced in the project is to enhance the trainees' awareness on the quality issues and their importance in the context of his/her own work. This is achieved with planning and generating materials on two levels, the general and the role-based levels.

At the general level are introduced the core concepts, which are necessary for the understanding and achieving quality ODL. The conceptual clarification aims at the comprehension of the meaning of core concept, like ODL, student-centeredness and student lifecycle, and their special characteristics with implications on quality. Quality is examined on the institutional, national and European levels. On the contextual level the objective is that the trainee understands the impact of cultural and institutional characteristics on quality in ODL. The aim is to combine the general knowledge of quality into trainee's own experiences and contexts. This enables trainee's awareness of special characteristics that has an impact on quality in his/her own institutional setting, and can situate his/her own role/roles into context of the student's lifecycle.

At the role-based level the material describes and defines the essential roles in the ODL. At the focus are different indispensable duties, not professions, which comprise the content of a role necessary for the quality ODL. Roles introduced in the materials can be roles of the one person, for instance a teacher. The roles can also be carried by a group of people, a team involved in ODL process and roles and activities are shared with team members. Important is that trainee understands all the required roles and their relations in implementation of quality learning event. The roles are described with the connected activities and the artefacts to be used in order to achieve good quality. The objective is that the trainees can on basis of the materials identify the necessary roles they have to perform, select the activities they have to take and choose the artefacts to be used to enhance quality in ODL.

Conclusion

Quality is a strategic issue for the success of ODL (Open and Distance Learning) services. In the *e-Quality* project, we aim to build a common model for ODL quality where we unify the core concepts without erasing cultural differences. For this purpose, we are currently building a methodological guide and training materials which will be validated *in situ*. To train the ODL actors, we choose to address the training of both the whole team and specific actors.

We will draw up a first assessment after the training sessions which will take place till June 2005.

The partnership

The project is supported by 6 institutions from 5 European countries:

- The Pőle Universitaire Européen de Montpellier-Languedoc Roussillon (France), that is in charge of the management of the project, on behalf of the UO-MLR (Open University – Montpellier-Languedoc Roussillon);
- The University Montpellier 2, France;
- The UOC (Open University of Catalunya), Spain;
- The University of Tampere, Finland;
- The Technical University of Szceczin, Poland;
- The University of Applied Sciences Switzerland (Haute Ecole Valaisanne Spécialisée);
- The University of Lausanne, Suisse.

The external evaluation is lead by the Belgian company ATiT.

The public project website: www.e-quality-eu.org

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FINNISH QUALITY MANAGEMENT IN WEB-BASED LEARNING

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Introduction

Quality Management in Web-based Learning (VOPLA) project is a joint venture between three Finnish universities, University of Helsinki, University of Kuopio and Lappeenranta University of Technology, to create national quality criteria and standards to web-based learning. The aim of the project is to support and enhance quality management in web-based learning, and to develop quality consciousness and expertise among the university personnel and their commitment to the quality management work. The project started in 2004 and will continue until 2006. A preliminary study has been carried out in 2004 to establish the current quality management situation in e-learning in Finland. During 2005 the project aims to develop e-learning quality criteria and standards in national workshops. The project team will build up an online service and quality criteria tools into the Finnish Virtual University (FVU) portal. The developed criteria and standards will be tested during 2006 in pilot projects in the universities[1].

The need for quality management in web-based learning has risen in European[2] and national educational policy discussions as well as in quality surveys and questionnaires targeted at university students and teachers. Web-based learning has established itself as part of the everyday operations in the universities. However, expanding the use of e-learning has put pressure in changing the organisation, processes and services in higher education. In this situation, more emphasis has to be put on the quality of operations and contents of teaching and learning, online learning materials and pedagogical and technical support services for web-based learning.

At present, some quality management work has already been started in Finnish higher education. However, it is yet to be systematised. Quality systems are built on already existing quality models or on self-developed quality principles. Those quality models that are in use in the universities are based on, for example, ISO 9001:2000 standard, EFQM model or EQUIS model. Balanced Score Card criteria have also been used as a basis for quality control. Until now, higher education has used corporate quality criteria in their quality assurance work. However, according to Parker[3], we have to take a step back to evaluate these criteria and determine whether they fit into the academic field. Thus, corporate quality criteria must be adjusted and modified to suit the purpose in higher education. And the work must be done by the academics, not corporate consultants.

Problems relating to terminology

One of the problems in web-based learning and quality management work is that the terminology is still quite unclear. People are using the terminology ambiguously, without defining the terms. Thus, terminology has to be clarified before the quality process can continue. Here ***quality management*** is seen as creating quality systems, ***quality assurance*** is applied to processes and criteria. ***Quality management procedures*** are the practical steps in enhancing the quality systems inside university operations.

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[1] www.helsinki.fi/vopla
[2] Dumont 2004
[3] Parker 2004:393

In view of the international quality management work, some e-learning criteria have been developed in open and distance learning (ODL)[4]. Often quoted learning quality criteria are, for example the factors relating to the educational organisation, curricula, learning and teaching, infrastructure and student service, and evaluation methods. Quality criteria are always developed for a certain country or institution. This is also visible in the criteria and terminology. The emphasis on quality management and criteria is shifting from teaching and planning the courses onto learning results and more student oriented quality management. Therefore, students must be remembered in building quality management systems. There has to be a "shift" from a "provider focus" to a "learner focus"[5] to accommodate students, universities' clients. This change of perspective has to be accounted for when creating quality criteria for web-based learning.

The challenges of quality management in web-based learning

Over the recent years, the main goal in university personnel training in Finland has been to develop best practises and wider knowledge of online teaching, online learning material production, and pedagogical and technical support services as well as developing university personnel's knowledge in e-learning in general. Now that web-based learning has been more or less established as part of universities' basic function, the emphasis is shifting more on quality. In Finnish higher education the following questions have been considered:

- How quality is defined in universities' main functions?
- How quality can be assessed?
- How quality is integrated in the existing operational procedures in the university?
- What kind of quality management system there should be in higher education?

In Finland, quality management work has developed rapidly in recent years. Finnish educational authorities have taken an active role in guiding the quality work. Higher education sector is urged to consider quality as a wide phenomenon, covering all the functions in the universities. Teaching and research, administration, management and infrastructure must all be included in the quality process.

The quality criteria of international quality organisations, such as Quality Assurance Agency, Canadian Recommended e-Learning Guidelines, and Qualifications Framework in Australia, have developed various quality criteria that can help in defining more specific criteria and scope for web-based learning and teaching, online learning materials and pedagogical and technical support services. Student evaluation is an important part of assessment for quality in university education. However, it should not be the only assessment tool for development. Universities and local authorities must work together in creating self-assessment, auditing and national qualifications schemes to establish quality in web-based learning.

In Finland, Quality Management in Web-based Learning (VOPLA) project takes up this challenge by:

- building internationally comparable quality management models and criteria for e-learning;
- strengthening e-learning quality network and expert co-operation in Finnish Virtual University (FVU);
- planning and developing high-quality e-learning service in Finnish Virtual University Internet portal;
- connecting quality management of e-learning to the overall development of teaching quality, university quality management work and resources allocation negotiations inside universities and between the universities and the Ministry of Education.

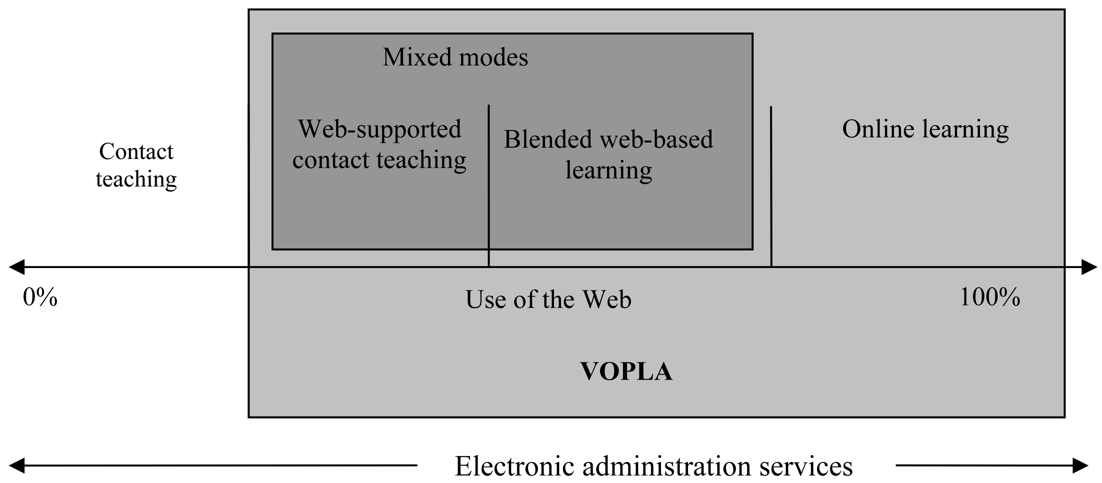
[4] Sangra, Albert. 2004

[5] Parker 2004:390

Quality criteria for web-based learning

The same principles apply to web-based learning as in the quality of teaching and learning in general. However, there are some special characteristics in e-learning that need to be specified. In its first report, the Quality Management in Web-based Learning (VOPLA) project team has emphasised quality management and assurance in three areas of we-based education, namely 1) teaching and learning, 2) online learning materials and 3) pedagogical and technical support for e-learning including equipment, facilities and training.

As well as defining the terminology in quality management work, it is essential to define the terminology of web-based learning. The project team in its report[6] (VOPLA) has defined e-learning in the following way:



Anthony Bates's[7] and Tiina Ojala's[8] researches have been the basis for the definitions in the picture above. Web-supported contact teaching refers to teaching where part of the course – course planning, course management, implementation, studying or evaluation – is transferred into a web-based environment. Most of the teaching, nevertheless, is administered face-to-face. Blended web-based learning means teaching and learning where contact classes and online sessions alternate, for example, a course starts with contact session then there is a 3-week online period and then there is one contact session again. Online learning, here, means education which is given totally online. Electronic administration services cover course information and registration of students and course results, i.e. administration that has been put online.

Quality of learning and teaching

Quality of learning and teaching is a complex phenomenon. Therefore, it is difficult to define it unambiguously. Key factors in quality of teaching and learning are:

- how do we define quality;
- from whose point of view quality is examined;
- in which stage of teaching quality is developed;
- in which context quality is measured.

We can look at quality as exceptionality, flawlessness, appropriateness, cost effectiveness or change. The possible stakeholders in quality measurement are students, teachers, university administration and online teaching facilities (part of the infrastructure). When defining quality criteria for teaching

[6] Sariola 2004 (ed.)
[7] Bates 2000,28.
[8] Ojala 2004

and learning, different phases in teaching, i.e. prerequisites of teaching, planning, implementation and evaluation, must be taken into consideration. Also the different roles of the teacher and the student must be remembered. The roles of the teacher and the student change in an online environment, thus, demanding new skills both from the teacher and the student. Teacher's role online is one of facilitator and tutor, guiding the student on the path of discovery and learning. The student is in a role of independent explorer, who receives help from his/her tutor and peers. The student has to take more responsibility for learning, thus demanding more from the teacher who has to give implicit and clear instructions, develop logical and balanced e-tivities[9] i.e. online activities.

Quality of online learning materials

Before defining the quality criteria of online learning materials, we must define the terminology in the field. In the first report of the VOPLA project team online learning materials are understood to cover various digital learning materials, which have a close connection to goals of the learning tasks and can be utilised in web-based learning. It has its own content demands, and set goals for learning, and is available online. For example, material, which is online but does not include a learning task, is not considered an online learning material, it is only a resource material. There is no one set of criteria for online learning materials, but a combination of different models must be used, for example learning object model, usability model, process model, content model and meaningfulness of learning model. Different stakeholders vary the point of view taken on quality criteria. For example, from the point of view of a teacher and a student achieving the goals set for learning and effectiveness of teaching are central. From the point of view of producer, i.e. teacher or online content developer, production process modelling is important, and standardisation of learning materials is vital from the standpoint of the publisher, in this context it means the university or FVU portal. (www.virtuaaliyliopisto.fi)

Quality of pedagogical and technical support services

Pedagogical and technical support services are important in the quality of web-based learning because online teaching and learning require new skills both from the teacher and the student. Quality management of this type of infrastructure in web-based learning has just begun in Finnish universities, and is seen as a natural part of the quality management of other teaching and learning support services.

Support is given in the form of training on using online facilities, tools, equipment and software as well as supporting the teachers in creating web-based courses in a pedagogically sound way. All Finnish universities offer this kind of infrastructure and support in e-learning. Support is provided by centralised or divided model, i.e. there is a special unit or department giving and organising the support, or support is found in various departments, but it is not centralised. How the service is organised depends on each university in Finland.

Process descriptions of pedagogical and technical support services or quality criteria have been defined so far only in few universities, but the need for a process description and criteria is great. However, there already exist various support materials and instructions, which can be utilised in quality management work. Universities can use existing models, for example EFQM with which an organisation can measure its current situation, follow progress, find development areas and improve its operations. The model should be open, flexible and adaptable to different organisations and their functions.

Recommendations for further development of quality management work in Finnish higher education

The main challenge in the future will be how best practices and acquired knowledge in quality management work can be infiltrated in the universities' main functions, and how to commit all stakeholders to the quality management work. Quality Management in Web-based Learning (VOPLA) project suggests the following procedures in future quality management work in higher education in Finland.

[9] Salmon 2002

1. *The quality of web-based learning has to be placed in the perspective of overall teaching and learning*
   The quality management of web-based learning has to be connected to the overall university quality management, and as part of the quality management of teaching and infrastructure. Quality management of e-learning can serve as a catalyst of the overall quality management as well as an innovator of new quality methods. Furthermore, an important challenge in the next phase is the evaluation aspect of the goals of learning and acquired skills, and the effectiveness of teaching.
2. *The development of quality thinking is crucial in the quality management of web-based learning*
   Quality thinking is a conscious choice in quality management and the justification of the viewpoints taken in the quality management work in e-learning. Quality management has to be systematised. This means defining e-learning processes and criteria, and putting them into active use in the universities.
3. *Client and process perspective has to be taken in quality management work*
   The basic element of quality management is taking the viewpoint of the client and the processes. We have to examine operational quality and processes from the point of view of e.g. a student, a teacher, a researcher and a manager.
4. *The quality assurance of web-based learning has to be part of the strategic steering and management system*
   Quality management and assurance must be connected to operational steering and management system and integrated to universities' basic functions. Finnish universities have just recently started building up these processes and in most universities the process is yet to be finished. Thus, it is important to finalize the quality management work and start implementing the systems in the universities.
5. *A national quality network must be founded to support development and exchange of experiences*
   In order to fully utilize the best practises and experiences of quality management in national higher education, all the stakeholders, i.e. the national universities, the Ministry of Education, Finnish Higher Education Evaluation Council, and Finnish Virtual University, must create a common discussion forum and a working network on quality management in e-learning[10].

The work of the Quality Management in Web-based Learning (VOPLA) project team is twofold. Firstly, it supports the universities' internal quality management work by providing information on quality issues, developing quality criteria and processes in various national workshops. Thus, answering to the first and third recommendations of linking e-learning quality in teaching and learning as whole and taking the perspective of client and processes in universities and its stakeholders. Secondly, the project team promotes the national quality efforts by co-operating with the Ministry of Education, Finnish Virtual University (FVU) and Finnish Higher Education Evaluation Council (FinnHEEC) to implement quality thinking in universities' basic operations, and to ensure that e-learning aspect is recognised in the overall quality management work. Furthermore, a network for quality issues is founded to promote and support quality management in universities. This task relates to the other points in the recommendations for further action.

To achieve the tasks listed above, it is important to clarify the main roles in the quality process. The different forms of co-operation have to be described as goals and procedures and resources must be allocated. The main task of the quality network is to produce common knowledge about the quality issues and recommendations for quality management in e-learning. University stakeholders are supported in the future by co-operation of the national working groups and by a web-based service for quality assurance. The service provides not only the quality criteria but also tools for describing and using quality systems and processes.

Quality Management in Web-based Learning (VOPLA) project is starting the next phase in its project scheme by developing quality criteria, processes and models for e-learning from the viewpoint of learning and teaching, online learning materials and pedagogical and technical support services. If we

[10] VOPLA report 2004

look at quality as continuous improvement, we need to open up the processes and criteria to develop a practical quality management process. The VOPLA project team is responsible for organising various workshops and seminars on quality management issues in e-learning in Finland during 2005 to raise quality awareness in university stakeholders. The aim is to engage university personnel interested in e-learning to work together compiling quality criteria, processes and models for different universities to use in their internal quality management process. These workshops and seminars will also help form national quality networks, which will enhance quality thinking in various universities.

In the third phase of the project, dissemination and implementation of quality criteria and processes will be done through pilot projects during 2006. They are to test the developed quality criteria and service and report on results of using quality assurance criteria in their web-based learning projects. This information will be used to further develop and refine the criteria and the quality service portal.

It is important that the quality management tools and service is regarded practical and that it is easy to take it into everyday use in the universities. The goal is to help universities and its stakeholders improve their performance and continuously review their teaching, online learning materials and pedagogical and technical support services, as well as strengthening quality consciousness in all functions inside the universities. It is also good to open up the processes and evaluate universities' effectiveness and performance nationally and internationally.

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PEPCAA – PEDAGOGICAL PSYCHOLOGY COMPUTER-ASSISTED ASSESSMENT SYSTEM TO SUPPORT INITIAL AND LIFE LONG TEACHER TRAINING: A SOCRATES MINERVA PROJECT PROMOTING NEXT GENERATION COMPUTER-ASSISTED ASSESSMENT

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Abstract

It is generally agreed that improvements in initial and continuing teacher education are essential in order to achieve higher levels of pupil attainment, which are needed in the knowledge economies of the 21st century. Too often, however, educational psychology is either being neglected, or it is being taught as an academic subject, disconnected from its practical application in the classroom.

It is necessary to qualify teacher students and in-service teachers in a way that enables them to develop an effective, motivating, and reflective self-managed learning process with special emphasis on constructive and individualised feedback. Things that can be achieved in a perfect face-to-face teaching/coaching situation by means of immediate, competent, and constructive personal feedback, have to be modelled as identical in function in an e-learning environment, by means of a virtual dialogue between learner and real-time computer-assisted assessment (i.e. assessment that is permanently available and reacts immediately to learner performance).

PePCAA (Pedagogical Psychology Computer-Assisted Assessment System to support Initial and Life long Teacher Training) was a SOCRATES (MINERVA) project supported by the European Commission. It focused on key qualifications in educational psychology. Based on long-term leading-edge work of its European consortium members in the fields of innovative models for eLearning, LLL strategies, learner-centred competence development, and different aspects of metacognition, the MINERVA project PePCAA was successful in developing first prototypes of a reflective 'next generation CAA', assessing competences of adequate behaviour by means of the concept of so-called 'micro-scenarios', based on the reflective use of scientific knowledge and methods.

After mapping a European core curriculum on educational psychology, mental learning processes (PePCAA Learning Assessment Circle [PLAC]) were identified in order to construct suitable assessment steps and questions. Based on this background, it is possible to give feedback to the user that reflects which contents it would be useful to deepen, and how – using a metacognitive perspective via the implementation of confidence measures – the individual learning process could be improved.

PePCAA aims to bridge the gap between theory and practice through the use of scenarios that illustrate the link between theory and teaching practice. To facilitate the transfer of learning content to its classroom application, scenario-orientated computer-assisted assessments have been developed and successfully tested in five European countries (UK, ES, BE, DE, SE).

Background and relevance concerning the conference themes

Substantial improvement in teacher training is commonly agreed to be the prerequisite for the profound and sustainable innovation that society needs for our schools and the educational system.

To support and speed up the ongoing shift from a teacher-centred unilateral delivery of information to a learner-centred process of individualised acquisition of knowledge and competences (supported, consulted, guided, and coached by the teacher in a new understanding of his or her role), initial and also continuous teacher training have to shift their priorities from subject-led presentation of the practitioner's experience-based rules to competences, the ability to analyse and assess new situations and demands, and to develop adequate, scientifically well-based intervention strategies.

Any real learner-centred approach to innovate educational methods and systems has to include substantial progress in learner feedback on existing knowledge, competences, and the status of the actual learning progress and potentials. Therefore it is necessary to use a software tool to present formative scenarios and questions to the learner, to record answers for analysis, and to provide feedback. Things that can be achieved in a perfect face-to-face teaching/coaching situation by means of immediate, competent, and constructive personal feedback, have to be modelled as identical in function in an e-learning environment, by means of a virtual dialogue between learner and real-time computer-assisted assessment (i.e. assessment that is permanently available and reacts immediately to learner performance).

In order to support individual learning paths, improved diagnostic tools for monitoring and guiding the process of acquiring competence are needed:

'First generation CAA' (characterised by multiple choice and right/wrong identification) was limited to assessing the successful storage of information presented before in a defined, 'learning objectives-centred' process. The broadly observed flattening of learning outcomes triggered by this assessment method was seen as the inevitable price for immediate feedback and substantially lowered costs. 'Second generation CAA' – enabled by an interaction between more constructivist concepts on learning and more powerful hardware and software solutions substantially broadened the span of tools to matching, ordering, elements of logical and linguistic analysis, graphical and spatial reactions, tracing of motor responses, etc. The complexity of response behaviour and of the underlying processes of reasoning, planning, and comparing grew substantially. But that generation of CAA is still limited to terminology and to knowledge related to a specific learning process and the curriculum and methods it is based upon.

Today, we need means to better address the purpose of learning beyond the immediate learning outcomes: the competences (in a rather broad and psychological sense of the term) required for work, social cooperation, citizenship, and personal development and satisfaction.

Based on the many years of leading-edge work of the members of its European consortium (FIM NeuesLernen, Universität Erlangen-Nürnberg, Germany; Support Lab for Telematic Learning, University of Liège, Belgium; Open University of Catalunya, Spain; Faculty of Education, Gothenburg University, Sweden; University of Cambridge Local Examinations Syndicate and the Faculty of Education at the University of Cambridge, United Kingdom) in the fields of innovative models for e-Learning, LLL strategies, learner-centred competence development, different aspects of metacognition, the MINERVA project PePCAA 2002-2004 was successful in developing first prototypes of a reflective 'next generation CAA', assessing competences or adequate behaviour by means of the concept of so-called 'micro-scenarios', based on a reflective use of scientific knowledge, methods, and metacognitive strategies.

PePCAA – project description

PePCAA (Pedagogical Psychology Computer-Assisted Assessment System to support Initial and Life long Teacher Training) was a SOCRATES (MINERVA 2002-2004) project supported by the European Commission. It deals with key qualifications in educational psychology (further project information is available on the PePCAA website at http://www.pepcaa.odl.org/).

Using Computer-Assisted Assessments, PePCAA is intended to be a self-learning tool to support teachers and student teachers with actualising their learning potentials concerning pedagogical psychology, to initiate a learning process by using PePCAA assessments, and to demonstrate the relevance and impact of scientific results in this field for daily school life.

In order to bridge the gap between theory and practice, a scenario-orientated case description introduces each assessment, and the subsequent questions illustrate the link between theory and teaching practice. This scenario-oriented approach facilitates the transfer of learning content to classroom application. The use of computer-delivered assessments provides flexible, motivating material, which can be used in a variety of ways. The assessments are intended to stimulate interest in the psychology of education and to help to:

- develop knowledge and understanding of the psychology;
- apply the psychology to realistic classroom situations and to the role as a teacher;
- increase awareness of one's own knowledge and thinking processes (metacognition);
- reflect on the ability to apply knowledge.

Assessment development steps

European core pedagogical competences

The European consortium started to compile a 'common' European curriculum map on educational psychology by gathering existing curricula and official documents (from departments of education, governments or regional entities) from the partners' countries. This pool of items formed the basis for a specification of metadata to be entered into the question database. Then 400 keywords were presented, defined, and linked to 40 concepts, grouped into 4 issues (Objectives, Methods, Assessment, Processes – OMAP), generating three levels of metadata (keywords/concepts/issues). Based on these key concepts, scenario-oriented assessments were constructed.

PePCAA learning assessment circle

To foster a competence and behaviour oriented learning process, independent from the way of learning (i.e. providing equal opportunities for outcomes of formal, non-formal, and informal processes), and to provoke as well as to assess a reflective, critical use of knowledge and competences, mental learning processes (see Figure 1) have been identified in order to construct assessment steps and questions according to these processes. One assessment usually requires several of these mental processes but is unlikely to require all of them. Based on this learning and competence process, phase separation feedback can reflect back to the user which contents would be useful to deepen and how – by using a metacognitive perspective – the individual learning process can be improved.

Metacognition in CAA: confidence degrees

Metacognition is knowledge or awareness about one's own knowledge (e.g. Flavell, 1979). Driscoll (1994) wrote that "metacognition refers to one's awareness of thinking and the self-regulatory behaviour that accompanies this awareness" (p. 104). In other words, metacognition is awareness of one's own knowledge *and* being able to evaluate that knowledge. Metacognition is important because being able to distinguish between knowledge that you are more and less confident about allows you to use your knowledge effectively (Hunt, 1993, Leclercq, 1983). Metacognition is thought to have benefits in learning contexts since awareness and reflection on current abilities and areas of weakness are likely to improve study decisions and to hence have a positive impact. As the PePCAA project aimed to develop a formative assessment tool, developing users' metacognitive awareness could help to fulfil this aim. The combination of a question, its answer, and the question of how confident (confidence degrees in percent) the learner is with his or her answer (sometimes combined with a possibility to justify the answer) allows them to draw conclusions on where during the learning process difficulties have appeared and to raise the awareness of these learning potentials.

Various researchers have developed methods to measure metacognition (e.g. Gardner-Medwin and Gahan, 2003; Leclercq, 1983; Leclercq, 1993). Dieudonné Leclercq brought his experience in this area into the PePCAA project and Fred Neumann developed a Java add-on to the Perception software to allow confidence ratings to be added to questions where required, and also to provide a feedback report on the student's confidence indices at the end of the assessment.

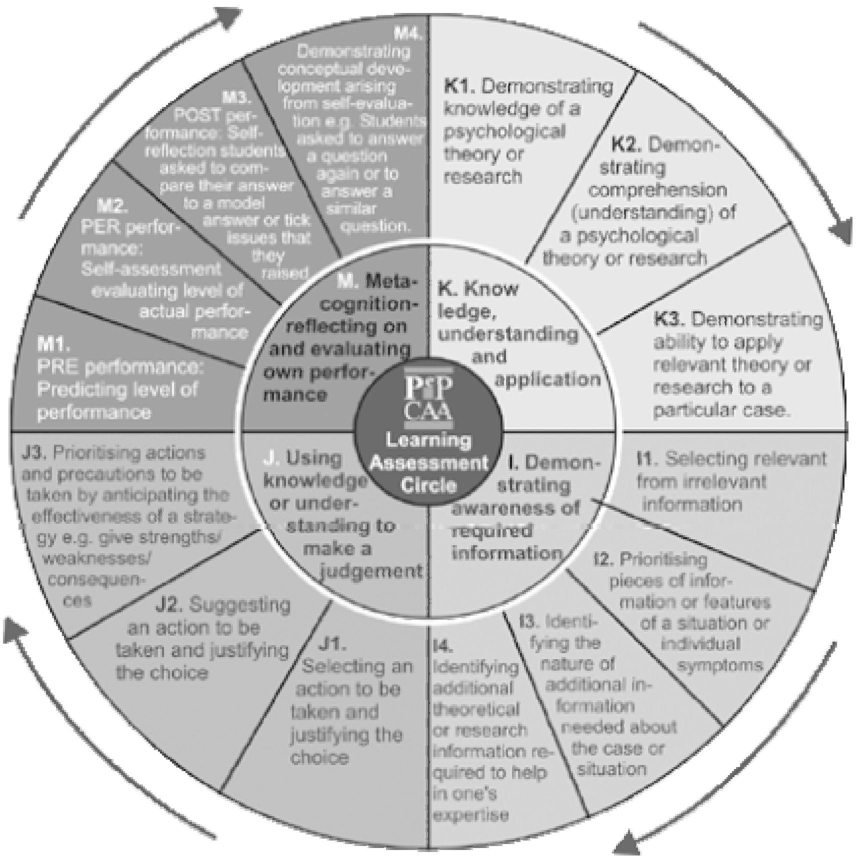

Figure 1. PePCAA learning assessment circle

Assessment evaluation

One of the basic conditions for an effective evaluation is that it leads us to a point where decisions for improvement can be made. For this reason, the assessment evaluation was carried out in two steps: a first, consortium-internal evaluation, and a second, trialling, with real learners in the respective countries.

Consortium-internal evaluation

In order to identify key characteristics of quality, we defined which advantages and disadvantages of such a product should be, and what is considered to be good with respect to each indicator and type of situation in which the indicator must be considered. The identified list of quality indicators was grouped into five blocks, which allowed us to progressively structure the information: scenario as a whole (pedagogical considerations, operational considerations), scenario description, individual questions, scoring and feedback, and transnational suitability. In order to obtain this information, every partner reviewed the assessments of the other partners according to the previously defined quality indicators.

Evaluation in a test bed of student teachers and in-service teachers

With the objective to obtain useful hints and estimations concerning desirable improvements and the general usefulness of our product, a feedback form was implemented after each assessment. It was divided into three parts: questions about the learner, questions about the assessments (see table 1), open questions. Users in all partner countries worked through the assessments and reviewed them using the feedback form.

The outcome of the trialling was, in general, very positive in all countries in terms of the methodology and specific scenarios. Participants reported that the cases were easy to understand, representing a real-life situation, relevant for teachers, well structured, stimulating and helpful. Some participants were not familiar with this kind of tool; however, they appreciated it as a very useful one.

Table 1: Statistical results per partner institution

Table 1	Average	Germany		Sweden		UK 1		UK 2		Spain	
		N	*Mean*	*N*	*Mean*	*N*	*Mean*	*N*	*Mean*	*N*	*Mean*
Knowledge of pedagogical psychology is very important to me	**1.19**	48	1.4	6	1.1	6	0.64	7	0.46	6	1
My current knowledge of pedagogical psychology is very good	**-0.09**	48	-0.13	6	-0.1	6	-0.39	7	-0.46	6	1
The assessment is easy to understand	**0.46**	15	0.4	6	0	6	0.88	7	0.04	6	1.2
The assessment is about a concrete real world situation	**1.16**	46	1.3	6	0.9	6	1.22	7	0.54	6	1
The assessment is about a relevant situation for teachers	**1.15**	46	1.28	6	0.9	6	1.36	7	0.54	6	0.9
The assessment is well structured	**0.71**	43	0.72	6	0.2	6	0.88	7	0.14	6	1.7
The assessment is too long	**-0.26**	46	-0.67	6	0.2	6	-0.33	7	-0.43	6	2
The assessment is stimulating	**0.84**	46	0.9	6	0.7	6	0.87	7	-0.04	6	1.5
Working on this assessment was helpful	**0.58**	46	0.43	6	0.9	6	0.95	7	0.04	6	1.6
The feedback given was helpful	**0.78**	46	0.78	6	0.5	6	0.97	7	-0.21	6	2

Values are sum of: +2 for strongly agree, +1 for agree, 0 for neither agree or disagree, -1 for disagree, -2 for strongly disagree

These results are encouraging, since all values for desirable statements (e.g. 'the assessment is stimulating') were positive and almost all values for the undesirable statement (i.e. 'the assessment is too long') were negative. The responses also tell us that most students thought psychology relating to teaching was important, but that they were not confident of their knowledge in this area.

Students seemed to like the concept of such a formative scenario-based assessment tool focussed on psychology relevant to teaching. However, a number of general issues were raised about the tool as well as more specific issues about the individual scenario-assessments. Changes were made to the individual assessment scenarios in the light of the above findings and the responses to the open questions in the questionnaire.

With regard to the types of questions available, some students liked having open-response questions even though they were not automatically marked, because they felt this made them really think about the question and formulate their own viewpoint. However, others felt it was not worth their time composing an answer if it was not going to be marked. Some students liked the multiple response questions which sometimes made them think about advantages, disadvantages or outcomes of a teaching strategy that they would not have thought of on their own. Other students were sometimes critical of the way that marks were assigned to such questions, arguing, with some validity, that there is not one definitive answer to such questions because the topic is somewhat subjective. In addition, some argued that the options provided in the multiple response questions did not provide the answer that they wanted to give. This is one advantage of using some open answer questions. With such mixed opinions and various advantages and disadvantages of the different question types, it is probably sensible to use a mixture of question types.

Some students reported that they would have liked to know how many questions an assessment was going to contain from the start. In some scenario assessments, in which we felt this might be a problem, a sentence was added at the beginning of the scenario during post-trialling revisions stating how many questions there would be in total and into how many sections these would be separated.

Some students (especially in Germany) reported that they sometimes found the psychological language that was used difficult. Since the aim was to improve their knowledge on relevant psychology, which would involve becoming familiar with such terminology, few post trialling changes were made with regard to the language used. Nevertheless, the students' comments highlighted the need to use technical language with care when preparing such assessments.

In order to make the assessments more formative in nature, and to respond to a few criticisms that not enough feedback was provided for some questions, more links to useful websites explaining relevant psychological topics were added to the assessments after the trialling. This will allow students to follow up on areas of interest or topics that they realise they do not currently know enough about.

The initial assumption of the project was that it would be possible to share scenario assessments between the partners from different countries, subject to translation and with only minor adaptations for language and detail. Experience from assessment development and trialling showed that transferability was in fact much lower than expected. Differences in the structure of school systems, differences in teaching approaches and priorities in teacher curricula lead to more extensive cultural localisation work of the assessments. For example in Sweden, educational psychology is not generally included as a subject in the curricula of teacher education programmes; however, other countries (e.g. Germany) have a much more theoretical approach to teaching the psychology of education.

Future perspectives

PePCAA made first steps to an innovative use of CAA to promote metacognitive scientific reflective eLearning and to integrate formal, non-formal and informal learning outcomes into performance-orientated competences. However, many other questions certainly still remain to be answered and also new technical solutions are required to accomplish next generations needs.

The project focus was limited to the field of educational psychology as an important element in the initial and continuing training of teachers. This work needs to be continued and expanded, including a broader conceptualisation, development, and pilot testing of the methodology in different European 'educational cultures' and languages. The potential could be explored in order to identify European commonalities in teachers' needs and teacher motivation and, at the same time, find out how to combine micro-scenarios on commonalities with scenarios and scenario-elements tailored for a specific culture, country, region, type of school, teacher subject, etc.

On the basis of PePCAA, new projects can aim at taking a substantial step forward towards developing a piloting tool that is sufficiently broad, mature, and important to open the door towards mainstreaming its development, and the integration of 'next generation CAA' into innovative eLearning in general.

Conclusions

In a period of constantly growing awareness on the importance of lifelong learning, in which informal learning is seen as a way to develop competences similarly important as formal and non-formal processes, in which the aims of education shift from reacting correctly towards behaving proactively and responsibly, reflecting also on goals, values and effects, learning assessment has to cope with those challenges in a provable way. It needs to be competence- and behaviour-oriented, independent from the way of learning (i.e. providing equal opportunities for the outcomes of formal, non-formal, and informal processes), provoking and assessing a reflective, critical use of knowledge and competences, accepting that a learning outcome as the process of learning itself is constantly changing as a dynamic portfolio, combing a reward for successfully mastered elements with the challenge and joy of new opportunities to set future goals.

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A SELF-ASSESSMENT AUTOMATIC SYSTEM FOR LIFELONG E-LEARNING

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Introduction

From tools' and targets' point of view, an e-learning system can be shown as a complex Informatics' System, in which software objects, communication tools, different professional profile resources and different typologies of network are integrated together. To realize a highly usable e-learning course, making learner skilful to build its metacognitive path it needs to arrange a set of dynamic properties during the (use and) training. So, through such dynamic properties, the learner is able to communicate with the system. One of the important dynamic functions in e-learning course management is the self-assessment, because it helps the learner in building her/his cognitive path.

This paper shows a building of a self-assessment automatic system, realized at ENEA using the KM^2 methodology [1]. The KM^2 methodology was developing to design asynchronous distance e-learning courses devoted to human and social capital development [2] that is to lifelong learning. In particular KM^2 methodology has been used to build training paths oriented to Diffusion of Scientific Information and to Technological Transfer.

Self-assessment as a training path

The self-assessment of a learning process is the measurement of acquired knowledge level growth made directly by the learner. The self-assessment is a very important step in the learning process, because the learner, during her/his self-assessment, catches the level of his/her own developed knowledge and measures the gap from the learning goals.

Into the personal learning plan, the self-assessment results drive the learner in the choice of learning process into her/his learning path; the awareness of own knowledge level makes the learner more confident of the next path choices useful to reach higher knowledge levels.

The learner has previous knowledge that forms his own knowledge heritage; this knowledge heritage interacts and integrates with the new knowledge acquired during the learning process through the cognitive-perceptive experience, causing a subsequent modification of her/his knowledge. The learner is aware of this modification through the self-assessment test [3].

The self-assessment into the KM^2 methodology

The KM^2 methodology considers the implementation of independent didactic resources that are planned to be used into a dynamic process driven by user requirements. The use of KM^2 methodology leads to the implementation of a learning system which is flexible and full of modular resources. These resources could be integrated into each other so the learning system can be based on a personal learning plan and can be driven by the self-assessment results.

The KM^2 methodology combines the didactic resources into courses. The methodology atomizes knowledge and structures it in modules, lectures and units, so the learner can better understand the content and can respect his own learning rhythm.

At module level, the KM^2 methodology defines as well:

- *learning goals*: they represent fixed goals in the didactic planning and they refer to specific contents in several lectures and units contained in a module; they are important to prepare aimed self-assessment test;
- *key concepts rucksack*: it contains atoms of organized information coming out from module subject splitting; the module is split into its semantic particles, so the teacher and the learner can manage and are in control of the content; every semantic particle is connected with a key concept and the concepts rucksack contains key concepts included in the module;
- *self-assessment test*: the test is used in the course as an important methodological learning tool addressed to the user; the test not only assess the learning but most of all helps it.

Learning goals, key concepts rucksack and self-assessment test represent indicators which help the learner to:

- steer herself/himself during the learning path;
- sum up the learning path content;
- measure the knowledge of a topic.

Learning goals, key concepts rucksack and self-assessment test are represented in the module through an iconic language as shown in Figure 1. The icon location keeps taking into consideration spatial guideline theory [4]. Figure 2 underlines the meaning of icon location which is linked by metaphor value.

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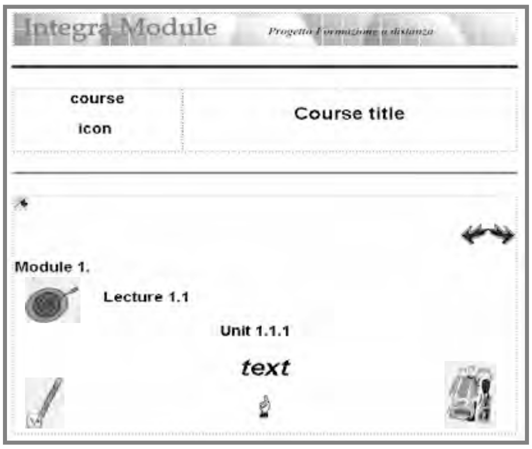

Figure 1. The structure of the ENEA KM^2 template

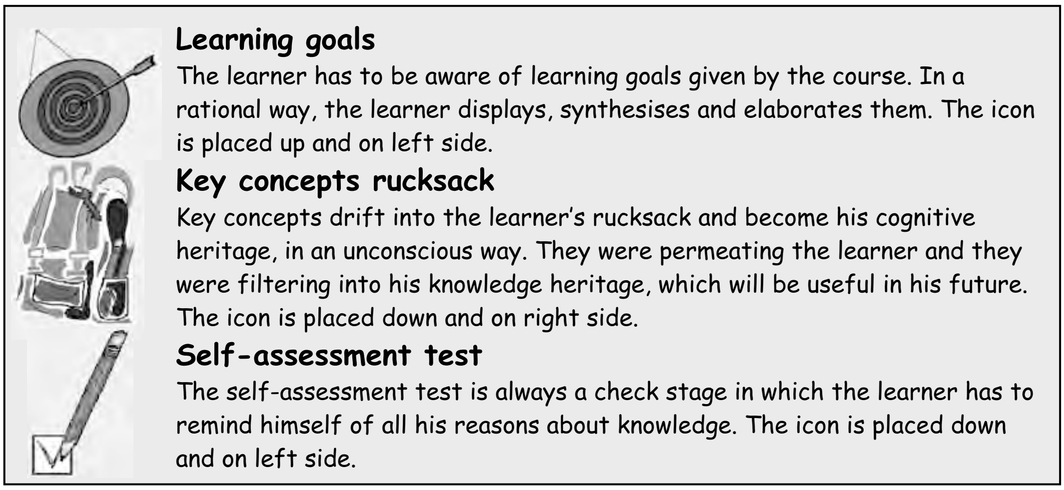

Figure 2. The meaning of icon location in the ENEA KM2 methodology

The self-assessment question

The question general formulation of the self-assessment test provides for management of two types of questions: multiple choice and true/false. Each question proposed has a single right answer. The multiple choice questions respect guidelines that meet some criteria, as: in each question a single problem is proposed; there must be syntactic and grammar continuity between question and answers; the alternative answers must be homogeneous in length and language used; the used words in the alternative answers must have an exact and clear meaning; it always needs to write assertions and not negations; assertions must be short.

Each question in the self-assessment test can be classified by kinds and by classes, in accordance with obtained knowledge level obtained from the learner and the type of transmitted information. So we can define a self-assessment matrix Kind per Class (Table 1). Kind and Class descriptions are given in the Table 2.

Table1: The Kind per Class matrix

	Class I	Class II	Class III
Kind 1			
Kind 2			
Kind 3			

Table 2: Kind and Class descriptions in the ENEA KM^2 methodology

CLASS & KIND	
Class I:	Questions in which the answer is directly obtainable by the test
Class II:	Questions in which the answer wants a lowest elaboration about course content
Class III:	Questions in which the answer wants to try out if the learner is able to work out the learned knowledge and methods in a more complex way.
Kind 1:	Information
Kind 2:	Understanding
Kind 3:	Skill

The self-assessment system

The automatic self-assessment System, implemented at ENEA [5], is articulated into three different areas, by following the different user's profiles:

- Administrator area
- Teacher area
- Learner area

Figure 3. shows the functions realized for each user's profile.

The System was implemented using open source software that complies with requirements of robustness, portability, adaptability, integrability. Moreover, the use of open source software frees the project achievement from budget constraints.

A Data Base that manages data related to didactic resources and data related to self-assessment path supports the System.

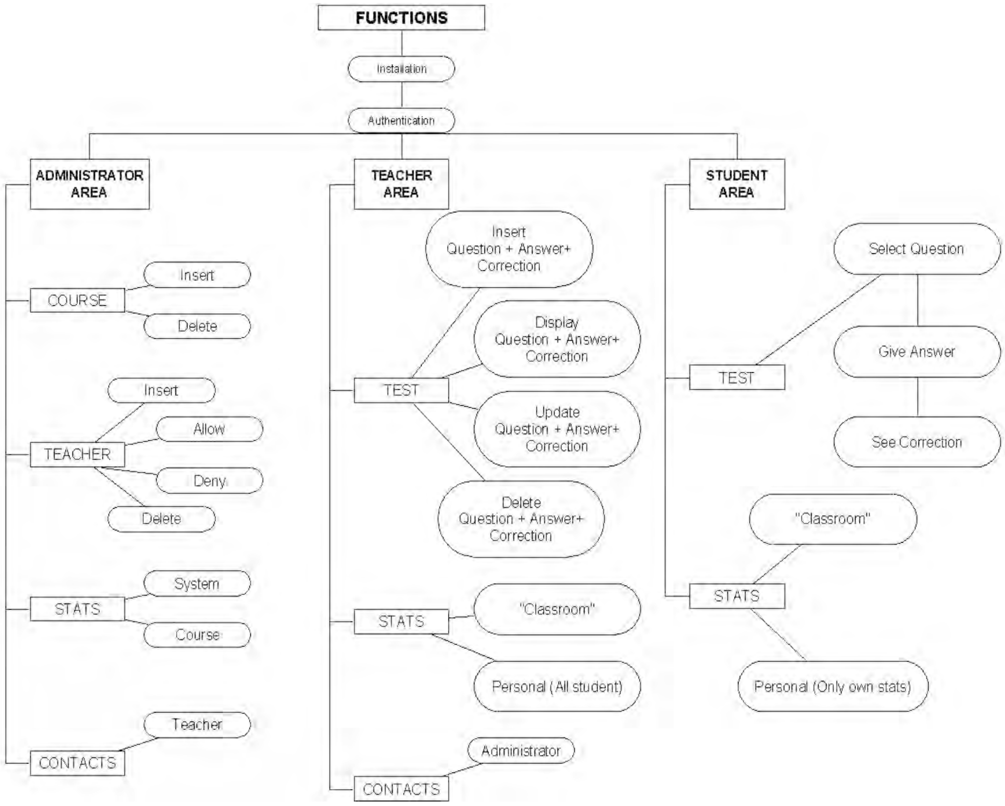

Figure 3. Self-assessment System Functions

The interactive self-assessment test is directly drafted by the teacher. The teacher can insert and update questions, answers and corrections using a friendly interface. The corrections can be expressed in multimedia forms: text, audio, video. The teacher chooses the type of correction more suitable for the question proposed.

The correction forms studied in the KM^2 methodology take into account the different cognitive styles of learners [6]; the KM^2 methodology proposes again:

- the web page of the course that contains all the elements needed to formulate the right answer. This web page doesn't appear in the same way as shown during the lecture, but contains underlining, highlighted parts, arrows and notes in the margin. All of this to point out the learner attention to the text parts needed to be reached the right answer (narrative cognitive style);
- the subject using a different learning tool, as video-clips and audio recordings, where the teacher itemizes the contents. The use of different tools stimulates other cognitive channels at different attention levels (kinaesthetic-emotional cognitive style).

The self-assessment path automatically managed by the System, is accessed directly by the course page module clicking on the self-assessment icon (Figure 4).

Figure 4. Self-assessment path

The learner, who during the course has observed the content from outside, during the self-assessment test examines the content from inside, he/she discovers the content organization, orients him/herself, revises pieces of information and builds him/her own knowledge usable in other context.

The self-assessment path verifies the achievement of course goals. The learner knows the goals because they are shown at the beginning of each e-learning module. With the self-assessment tests the learner can verify during (*in itinere*) the learning path own know-how and can highlight gaps, weak points or can strengthen the acquired knowledge.

Following the test results, the learner can continue the course or go back to analyse the unclear lectures, units, text portions.

The learner can give three kind of answer to the self-assessment system:

- Correct answer;
- Incomplete answer;
- Wrong answer.

The correction paths depend on the kind of the answer.

The automatic self-assessment system implemented at ENEA uses the 'traffic lights' metaphor to suggest the correction path, to the learner.

Right answer: the learner shows he/she had a good comprehension of the subject proposed, and then he/she can go to the next question.

Incomplete answer: the learner shows he/she had some difficulties with the subject, then the System proposes a revised didactic resource containing underlining, highlighted parts, notes in the margin (Figure 5).

Wrong answer: the learner still does not know and then the System proposes a new form of didactic resource contains videos and images (Figure 6).

The System collects and processes the results of every self-assessment path. The learner, identified by a nickname, remains anonymous.

Data and statistics concerning every questionnaire compiled for a course are accessible in the teacher area and statistics concerning the questionnaires of all courses are accessible by the administrator area.

At the end of the questionnaire the learner can ask the statistics of their own self-assessment path and can ask the System to display the general statistics to compare his/her own preparation with the virtual classroom level.

Figure 5. A revised didactic resource

Figure 6. Video correction

Conclusion

The KM^2 methodology considers the assessment as a knowledge tool: the learner learns also, and above all, through his mistakes. When the learner is reading the teacher's answer, the learner is ready to receive new knowledge; he is ready to understand where and why his answer is not right. We think that the self-correction process is the best way to offer again a support in knowledge path.

The self-assessment tool, integrated in the field of an interesting knowledge background about contents and usable conditions, develops the important task of motivating the learner to learn through reorganisation of reward systems.

The feedback, given by the self-assessment test answer, works as a support role about learning [7].

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EVALUATION AN INDISPENSABLE TOOL FOR IMPROVEMENT, IMPLEMENTATION AND ADVANCEMENT IN AN INTERNET-BASED PLATFORM FOR MEDICAL EDUCATION AND LIFELONG LEARNING

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Abstract

In recent years the development of computer-based programs for educational purposes has gained broad attention and a variety of commercial and non-commercial products are currently available. Evaluation has been an important part of the development of computer-based programs. However, the educational aspect of the programs was subordinate to the actual problems of technical possibilities and usability. Therefore, thorough evaluation of educational features seems indispensable.

In this paper we will investigate the role of evaluation as a perpetual tool in the use of e-learning instruments. We will furthermore scrutinize potential strategies for the implementation of e-learning in university teaching and lifelong learning.

Using the web-based program PROMETHEUS for the education of medical students and staff, we applied different methods of evaluation. A framework for educational technology was used to search for educational categories in the program. An online questionnaire was used to evaluate demographic data and acceptance by the user. Furthermore, statistic online-tools of the program were used to gain additional information about the users as well as performance and time spend with the program. A study success test was used with one of the student groups and finally, a questionnaire was implemented to acquire information about presence in the virtual environment provided by PROMETHEUS.

We were able to adapt the program to the educational framework of Laurrillard, the users rated the program very positive and we were able to show that working with the program established a comparable feeling of presence as in the validation group. The study success test showed improvement after working with the program. The user monitoring data showed the effects of changing the browser compatibility and the effects of the implementation of the evaluation results. Evaluation as a constant feature in computer based programs supports improvement, advancement and implementation.

Introduction

In the past years evaluation of computer-based educational programs was an important issue in publishing, but the results were often unsatisfying [1], [6]. Comparisons between e-learning programs and other teaching methods showed no or little difference [3]. Usability and acceptance do not offer data about efficiency and learning success, user monitoring cannot give us information about acceptance and motivation. Evaluation should not be based on one aspect. In principle, the instruments for evaluating computer-based learning should be tailored to the specific goals or learning scenarios defined for the specific computer application.

Steele [7] and Thorpe [8] suggest that there is not a single right way for evaluation. Instead, individual situations and tasks of computer-based learning require specific instruments of evaluation. Furthermore, according to Laurillard many evaluation studies produce predictable findings such as enthusiasm of the computer user, failure to show significant differences in the outcome of computed-based learning as contrasted to conventional learning, or potential for educational effectiveness [5]. These findings underscore the need to develop and use task-oriented instruments of evaluation in order to come up with meaningful and practicable results. This appears to be the only reliable way to analyse in detail the benefits and potential draw-backs of computer-based learning in comparison to conventional strategies of education.

At the University of Tuebingen we have recently developed the computer-based system PROMETHEUS for medical education funded by the Federal Ministry of Education and Research. Parallel to the construction of the web-based platform we have systematically developed instruments for evaluation of the program. The paper presented here reports our preliminary experience with the platform, its evaluation and provides the basis for a model of continuous lifelong learning.

Different methods for the evaluation were applied. A system analysis by the evaluator to find out about the educational aspects of computer based teaching methods, to define features for an administration and editing tool and to meet the technical requirements. For the educational aspect we used a framework for teaching with educational technology developed by Laurillard [4]. Britain and Liber used the framework to evaluate virtual learning environments through the tools offered in programs [2].

Table 1: Methods of evaluation

Methods of evaluation	
Evaluator	**User**
Educational framework	Formative Evaluation (Acceptance)
Technical features	Presence in virtual Realities
Administration and editing features	Study success test
User monitoring	

User based information was obtained through two questionnaires, one for user based formative evaluation and one for the quality of virtual environments and presence in virtual realities. Further information about effectiveness of the program was explored by a study success test we have developed. Both questionnaires were placed online on a server provided by one of the funding group participants, Singer from Heidelberg [9]. The first form provided information on soziographic data, acceptance like pleasure, quality and amount of content, relevance a.s.o. Technical features like usability, optical design and performance.

The second questionnaire we adopted from R. Scheuchenpflug in order to quantify and assess the degree of immersiveness and presence the user experiences while working with the virtual clinic. Reading a book may keep people from answering questions, children watching movies move according to the action on the screen. They feel present in the virtual environment and to a certain degree experience the action as real. The quality of a virtual experience is influenced by the ability of the interface to allow the feeling of being in the virtual situation.

Scheuchenpflug states that the degree of perceived presence depends on system properties. He developed a tool to measure presence as well as the users tendency to get immersed in alternative realities. Originally, this questionnaire has been designed by Wittmer and Singer and was adjusted by Scheuchenpflug for virtual programs validated on a group of ego shooter players. These games have a high tendency for presence and immersion.

Methods

The program

PROMETHEUS is an instructing and learning platform for medical education presenting itself in form of a hospital case simulation. It is a database-driven web application for medical students and faculty of the University of Tübingen in cooperation with eight leading German Universities. Built around SQL server databases (MySQL) and driven by Java programming this application enables students and faculty to interview and examine authentic, virtual patients. Interdisciplinary cases are presented in different clicical settings and can be followed up completely by the user. The objective is the improvement of medical education and the development of some expertise by the user.

The user is supported by a virtual expert and self explaining navigation tools. An Internet Cafe offers tools for discursive and reflective learning. A web based evaluation questionnaire supports the assemblage of evaluation data.

In addition to problem based learning, the embodied virtual library allows methodical learning.

PROMETHEUS provides an examination tool, which has been developed in analogy to an objective standardized clinical examination (OSCE). The actions of the user are documented and rated according to the requirements of the teacher.

Initial evaluation

In 2001 a group of student was interviewed with a paper form after solving a testpatient presented over a prototype program. A questionnaire, developed by a specialist group recruited from the participating universities was used for a formative evaluation. The users were asked about usability, layout and were given the opportunity for freetext feedback.

The overall acceptance of the design and set up of the program was very good.

Evaluation of the educational model

PROMETHEUS was analysed for tools and methods to accomplish the needs for the four categories stated by Laurillard. Through a program analysis, based on the educational framework and the checklist for the analysis of teaching media, the system was adapted to fulfil the needs for effective teaching with multimedia methods.

We used the framework categories to search for instruments to implement discursive, interactive, adaptive and reflective elements. For example we explored the platform to where in the system can the teacher set task goals, where are possibilities to reflect on action, where can the student act to achieve task goals?

Table 2: Activities necessary to complete the learning process

1. T can describe conception
2. S can redescribe conception
3. T can redescribe in light of student’s conception or action
4. S can redescribe in light of teacher’s redescription or student’s action
5. T can adapt task goal in light of student’s description or action
6. T can set task goals can act to achieve task goal
7. T can set up world to give intrinsic feedback on actions
8. S can modify action in light of feedback on action
9. S can adapt actions in light of teachers description or student redescription
10. S can reflect on interaction to modify redescription
11. T can reflect on student’s action to modify redescription
    from Diana Laurillard

Evaluation of acceptance

To acquire some demographic data on the users and to document the acceptance of the program by the user, a questionnaire was developed by an expert group out of the original participants of the funding program. The questionnaire is placed on a server and can be used online. CSV data simplifies the transfer and the interpretation of the filled out forms. We have used the form on three student groups in blended learning sessions (n=25).

Evaluation of effectiveness

During the summer term 2003 a group of twelve students volunteered for an evaluation setting. The setting was a blended learning situation with alternating online and presence sessions. The study ran over five weekday mornings including an introduction meeting before the study.

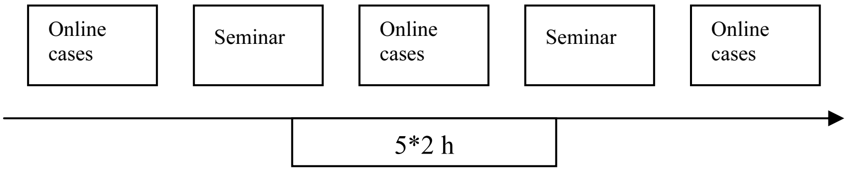

Figure 1. Evaluation setting

The study on effectiveness was designed as a pre-, post-assessment. The students were given a paper case and a long list with four categories: medical history (94 Items), physical examination and technical diagnostics (93 Items), laboratory work (85 Items) joining the information meeting. They had to mark a given amount of items they thought to be relevant in the paper case and on the last sheet state a possible diagnosis.

On the last day of the blended learning week they were given another paper case and the same long lists. The cases had been rated (unimportant, important very important) beforehand by a specialist. The results of the pre- and the post-assessment were compared.

Evaluation of presence in virtual environments

For our purpose to inquire about the quality of the interface in matter of virtual presence the questionnaire from Scheuchenpflug was used on student groups during three different blended learning seminars (10, 6, 9 students).

Our student groups filled out the online presented questionnaire after the second online day. Irritations by the use of a new program and handling difficulties because of inexperience with the system were to be avoided by this strategy.

Evaluation through user montoring

In order to assess the time spent in the system by non student users and to log their actions in the system we implemented awstats. This freeware tool easily allows for the statistical data available in the computer system to be interpreted. The logfiles of the checked in users can additionally be evaluated through the systematically logged data. The evaluation of the user files will lead to completely new aspects of evaluation, when the system will be used in different countries, as country specific learning behaviour and problem solving strategies.

Results

Evaluation of the educational model

The system analysis showed that the platform already provided many features for educational quality. A notebook tool for reflective working and a discursive tool for discussion was still missing. In the PROMETHEUS 2 version we included the notebook and a forum tool to enable course information to be posted. A handout was distributed to the students to clarify objectives and to explain the system and technical standards. We chose the combination of online work and seminar to discuss the cases offered in the system. In this blended learning setting we were able to include all elements of the educational framework. In the PROMETHEUS 3 version a course management tool will be added to complete the educational standards. The platform will be built on a valuable educational frame to meet highest standards in education.

Evaluation of acceptance

We obtained data from 25 users. The results are shown in Figure 2.

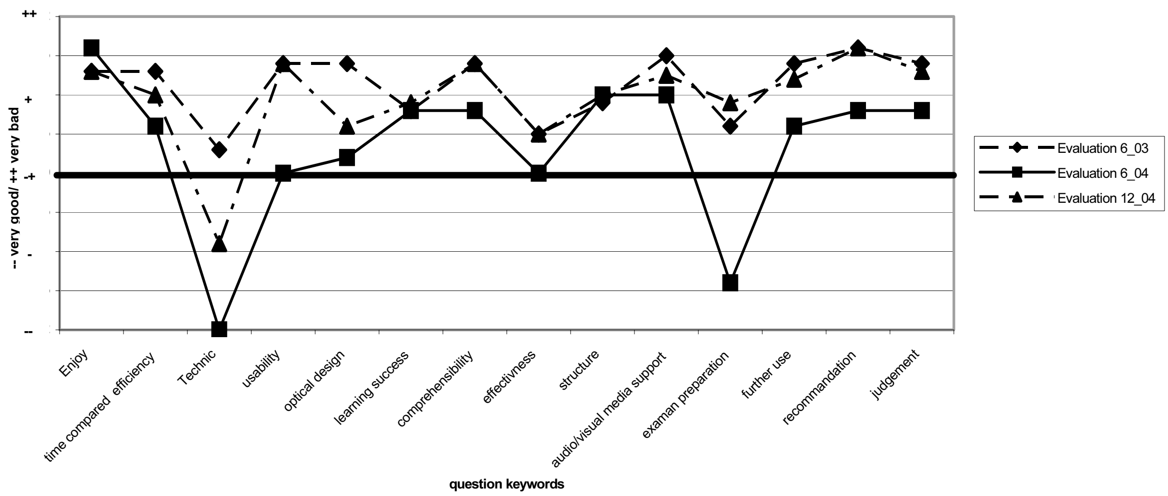

Figure 2. Summary of user formative evaluation

Technical problems occurred during the seminars because of problems with the first PROMETHEUS version. The seminars with the second version ran problem free. The students enjoyed working with the system. The overall judgement was very good.

Evaluation of effectiveness

Gain of learning success, is the student able to diagnose more sufficient after using the case simulation (faster, more focused handling of medical history, examination and lab work): development of experience and expertise.

We found an improvement in the pre/post setting. The light columns show the results of the test before, the dark columns after using PROMETHEUS, splitted in medical history, examination and laboratory work. We still have to test with a control group.

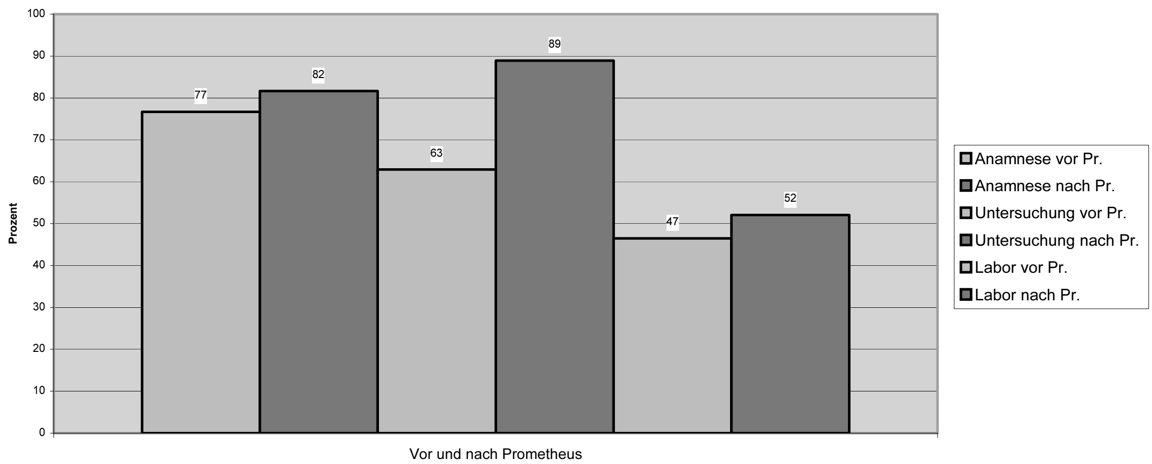

Figure 3. Comparison of student results pre/post use of PROMETHEUS

Evaluation of presence in virtual environments

The results of two student groups were evaluated. During the session with the second group we had technical problems. We expected the development of virtual presence to be less in this group. The data confirms this. The presence was disturbed in Evaluation 2 by technical problems.

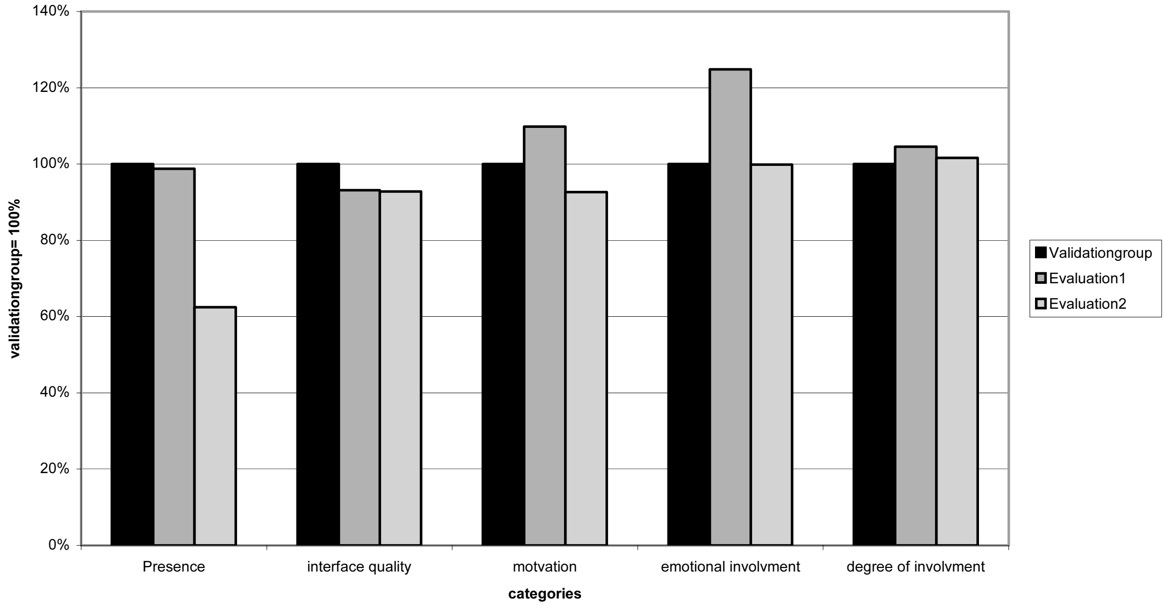

Figure 4. Results of presence questionnaire

Evaluation through user monitoring

Many different aspects of user monitoring deliver information about the users behaviour. We can obtain the patient files of every user and therefore will be able to monitor the way of diagnosis the user went. The patient file covers a complete feedback on each case, cost and time expenses, diagnosis and rating of the examinations. The awstats statistic tool allows us to acquire information about all online users. Error logfiles give detailed information about every occuring on the server. These information are used to permanently improve the system quality and data consistency. The numbers of users is used to control the system performance combined with a real time performance monitoring (cpu load, memory usage, network traffic). Figure 5. shows the large increase in visitor numbers after the implementation in the internet explorer (PROMETHEUS version 2).

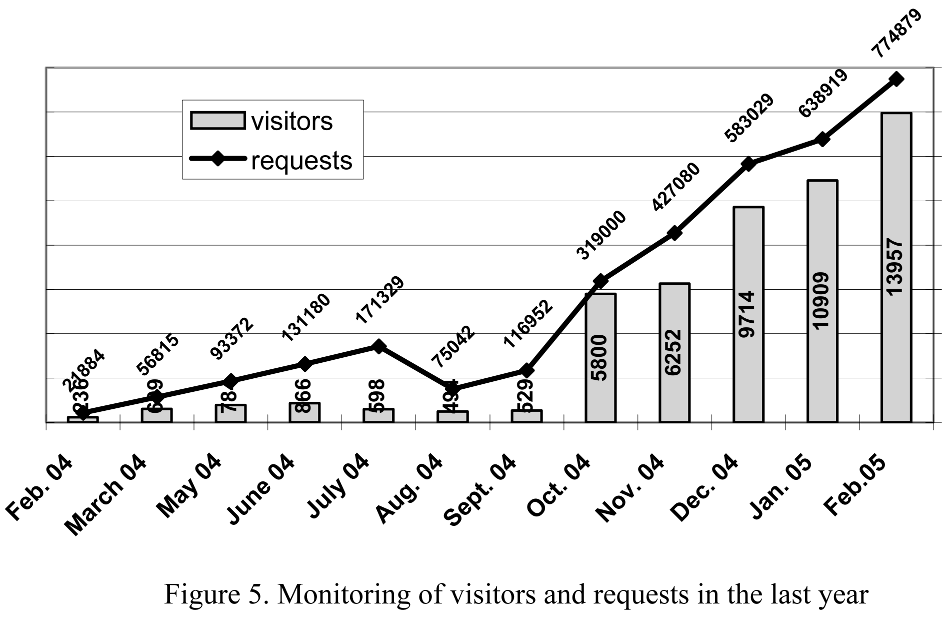

Figure 5. Monitoring of visitors and requests in the last year

Discussion

The aim of evaluation is to improve the teaching technology to perform effective teaching and match or overcome traditional methods of training with educational technology. Advantages like time and place independent settings, working at own pace and motivation through case based problems are evident. We found that an educational base of the program is imperative to successful implementation. Studies have shown little or no advantage in training with computer based applications against traditional methods, we found that these studies neglected the educational options and abilities of the computer technologies. The educational frame of the program is essential to the acceptance by the user. The blended learning setting added to the educational value of the problem based approach.

The self-explaining, intuitive interface and the general and continuous design used in the program delivers a high possibility for the user to get immersed and feel a high degree of presence in the system. The negative influence of technical failure on the realisation of presence was supported by the results of the questionnaire on presence.

Effectiveness of the program still has to be proven but the developed tool for monitoring learning success was practicable and showed improvement after solving five online cases.

We encountered some reservation by the student users, who stated that such a virtual tool might minimize bedside teaching and patient contact. The blended learning setting was able to diminish these fears, but care must be taken that students are not left alone with their virtual experience.

The future challenge is to provide an evaluation model to support and improve the continuous changes in program development with a strong objective on educational value and effectiveness. Implementation will happen as the fellow teachers will realize the advantages of educational technologies as a time and source saving tool with high educational value. The results of the different aspects of evaluation support the interlocking of educational, technical and usability criteria.

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POST-GRADUATE STUDENTS' INITIAL RESPONSE TO E-LEARNING: A QUALITATIVE INVESTIGATION

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Abstract

A new post-graduate program was launched during the academic year 2004-2005 at the University of the Aegean, Greece, entitled "Gender and the New Educational and Employment Environments of the Information Age". This program is distinct from other programs presently offered in the country, as well as abroad, in a number of aspects: (i) it is *multi-thematic*, (ii) the modules are *interdisciplinary*, (iii) they are *co-taught* by experts from various disciplines, but most importantly, (iv) the program is implemented through *distance learning* and (v) which is implemented in an *e-learning mode*. As a result of these features, this innovating program of study offers a good case for evaluating both the *pedagogical* and the *technical* aspects of new, technologically enhanced educational structures and processes. Part of this ongoing evaluation is the present qualitative study of the students' initial responses to the novel e-learning, distance learning situation.

Introduction

The traditional theoretical controversy over the mutually exclusive use of *quantitative* vs. *qualitative* approaches in evaluating social phenomena has been in recent decades moderated. The main criteria for carrying out an evaluation scheme have become the degree and the manner with which it is carried out and the contribution it makes to the people actively involved in the project (utilization-focused evaluation). In this framework, the evaluation process has come to be viewed as a *learning strategy* for the institution, as well as for the people participating in the program and its evaluation processes.

The relevant research on the *evaluation of educational programs* in particular, has primarily focused on efficiency measurement, which however goes beyond describing the phenomena under study, analyzing processes and procedures and the reasons for which they are undertaken. [26] This leads to a more "qualitative" approach to educational procedures, actions, reactions and interactions among program participants. In this paper we focus on *students' responses* to structures, internal processes and overall functioning of the e-learning process. The evaluation of the IT infrastructure and system operations, in relation to the pedagogical goals set out by the program, coincides with the appraisal of the systems' value and suitability to participants' goals and needs [1] [13] [5] [23] [11] [19] [20].

Our *qualitative approach* of investigating this e-learning initiative has come to be a very important aspect of a multi-faceted evaluation model which includes both quantitative and qualitative measurements. In this approach, we are interested in the students' initial response to the overall design of the program and their views on the daily procedures or learning situations they become engaged in. Given the innovativeness of the program as a whole, but more importantly, given the use of ICT in its implementation, we expect that the evaluation of the project will serve as a good case for establishing the viability, as well as the effectiveness of maximizing the use of ICT in Greek tertiary education. In the remainder of this paper, we first briefly describe the program and then we present the findings of our preliminary investigation.

The Post-Graduate Program and its Participants

The post-graduate program "Gender and the New Educational and Employment Environments of the Information Age", was launched by the University of the Aegean, Greece, during the academic year 2004-2005, within the context of promoting and implementing European Union policies on new educational structures as well as on gender equality. This program is distinct from any other programs presently offered in the country, as well as abroad, in a number of aspects: (i) it is *multi-thematic*, as it is comprised of modules that focus on new forms of education, new forms of employment and new technologies in the new information age, as autonomous study units but also as they all relate to diachronic as well as new forms of gender inequality, (ii) the modules are *interdisciplinary*, drawing upon diverse disciplines, such as sociology, anthropology, psychology, economics, etc., (iii) each module is *co-taught* by an average of three experts from these various disciplines, but most importantly, (iv) the courses are taught by means of new educational technologies of *distance learning,* (v) in an *e-learning mode*.

Forty students were accepted in the course during the first year, most of them employed as full-time professionals in education, public service, IT sector and engineering. The age range varies from 23 to 50 and they reside at different areas of the country (urban, rural, islands, etc.). Most of them had no experience on distance learning procedures, let alone on e-learning situations. For most, this program was their first attempt to participate in alternative forms of education. Students' experience on computing and network applications diverges from very experienced users to less experienced ones. Through an on-line delivered questionnaire it was revealed that the particular program was chosen for a variety of reasons that had to do with the content of the program, the method by which it was offered and with personal motives and interests.

The E-Learning Structure of the Program

The postgraduate program was designed as a full time e-learning program with extended use of e-content and advanced network-based interactions, supported by a modern academic enterprise system [3] [8] [14] [16] [24]. This architecture has come to be a "one-way road" as students and instructors are scattered throughout the country [15] [21]. Moreover, most of the students are employed full-time and flexibility was a critical issue for them [6] [7] [9] [12]. Below we expose some of the most important elements of this e-learning setting. Apart from the traditional ways of delivering learning material in a typical distance education program, the program emphasizes modern educational processes, supporting (i) *collaborative* learning and *group work*, (ii) *independent* studying, with the tutor acting as a facilitator to the learning process and (iii) learning through self-directed *inquiry*, supported by the appropriate methodology and access to resources [2] [4] [10] [17] [18] [22] [25].

"Lessons" are distributed through the internet as e-packages [11] (or "learning modules" according to the platform's terminology), consisting of different types of learning *items*, the most important of which are: (a) Course Introduction and analytic Syllabus in the form of html, slide-shows, multimedia files, etc., (b) Teacher's supplementary texts and notes, (c) Assigned readings (in full-text format), (d) Bibliography, required and suggested, (e) Tests, self-tests, surveys, etc., (f) Assignments, (g) Student activities in the form of group or individual work, (h) Inquiry and research activities, (i) Discussion rooms on specific issues, (j) Chat and whiteboard sessions, etc.

Lessons are progressively published, according to criteria selected by the instructor(s), such as students' progress, time-release policies, etc. By these means, it is possible to design a customized, personalized way of study [2] [3] [18]. *Student evaluation* is continuous and is implemented in a number of alternative forms, with the professors offering systematic feedback throughout the duration of the course. The system also provides tutors with statistical data so they can monitor participation rates and time of engagement with each learning object, on an individual or group level.

Content materials are offered in a multiplicity of forms, in each case suitable for the purposes and the nature of the learning object or procedure. Hence, some of them are text-oriented (in cases enriched with pictures, audio or video), while others have a more enhanced form, supporting student-student and student-teacher interaction. Yet others have forms of content material that simulate aspects of the *in-classroom* instruction (e.g. presentations with slideshows accompanied with speakers' audio). All sorts of study material are organized in *media libraries,* which facilitate storage as well as search procedures. In addition, an extended use of hyperlinks to Internet sites (free or under subscription), offer improved capabilities for study and inquiry.

Learning activities vary from readings, writing of short or long essays, usually published on the public discussion rooms, bibliographic research reports on selected subjects, participation in group or one-to-one discussion forums, teachers' "office hours" for tutoring and personal on-line conversation with the students, etc. Students are encouraged to work in groups, to exchange information, ideas and suggestions through synchronous or asynchronous communication. In order to develop collaborative learning procedures, sub-groups are formed, with alternating participants, and they are assigned study and research tasks, which they pursue making use of their own chat rooms, discussion forums, and other collaborative tools of the platform.

Special care is taken to overcome whichever problems arise from the absence of regular personal – in vivo – communication among participants (students and instructors). Discussion rooms, chat sessions and feedback mechanism via e-mail are used to ensure the immediate and effective solutions to such problems. Instructors/tutors play an active role in these activities by following up on important issues. The aim is to ensure the effectiveness of the whole procedure from a pedagogical aspect, as well as to improve the role of the technology media used. Because the program has basically targeted employed adults, it uses mainly asynchronous techniques of communication (in order to support *independent* and flexible forms of learning) [18] [22]. Even so, we have used on-line synchronous communication tools where the instructor introduces a subject to a group of students (through slide-show or text only material) and the participants take the opportunity to exchange ideas and information. We have also introduced the practice of saving the on-line conversations and publishing them as learning material for all other sub-groups of students, a practice which all participants have found extremely useful. To supplement all of these "virtual" forms of learning activity, we organize actual in-class workshops, on the average three times per semester, when all the students and professors come to the campus and hold two-day intensive seminars on each of the modules, as well as discussion groups on the functioning of the program as a whole.

The Qualitative Investigation

A multi-faceted form of continuous program evaluation was incorporated into the program's design, as it is regarded as playing a major role on the initiative's overall success. The evaluation procedures used, include both: (a) *continuous assessment* processes, carried out continuously throughout the duration of the program, with the aim of identifying possible sources of insufficiency and/or ineffectiveness and (b) *pre- and postcomparative* analyses used to locate and measure the effectiveness of the initiative. One of the first aims was to identify and evaluate *the initial response of the students to the e-learning architecture and the learning content and procedures*, which we here focus on. The empirical data were gathered from the following sources:

1. Students' answers on a structured questionnaire, delivered anonymously on-line, which charted student goals and expectations from the program.
2. Minutes of the open discussion with students and instructors during a two-day meeting held on campus in the middle of winter semester.
3. Students' answers on a structured questionnaire completed during the above meeting.
4. Messages sent to the program's e-learning administrator and technical support staff.
5. Mail messages to the instructors, and
6. Discussions held on discussion rooms, concerning the platform and its components.

The above sets of data were processed in order to reveal the main categories of the analysis. More specifically, texts from mail messages, live conversations, and open questions from the questionnaires were abstracted in order to form the basis of content analysis, thus allowing us to theorise on the range of students' initial responses to the various aspects of the program. Students responses were coded in six distinct categories which, given the limitations of this paper, are presented in summary form bellow.

A. Students' first feelings about entering the program

Responses from the various sources described above reveal that the first feelings students had about returning to an organized educational process were that of excitement and enthusiasm. Many saw their participation in the distance learning program as an opportunity they were long seeking to renew themselves, personally and academically, without a major upset in their lives. There was also an element of excitement for participating in a novel – for Greece – e-learning program. Student excitement was retained and once they got actively involved in the actual educational procedure, as they found the e-learning platform effective and user friendly. Very early on there was a concern for issues that had to do with the need for a precise step by step syllabus and a detailed academic calendar. Moreover there was a concern for explicit evaluation policies, as well as rapid and standardized feedback mechanisms and communication with tutors and other instructors.

B. Initial reactions to participating in the distance e-learning program

Students were satisfied with the introductory package offered to them before the beginning of the courses, which consisted of an extensive description of the platform, simulations, tutorials, on-line help, information feedback, technical support, customized support, etc. From the beginning they found the overall e-learning design effective and user-friendly. However, once the "real" courses came on line, "reality hit" the students. Many of them began to express shock, as they felt swamped by "*too many texts to read*" and "*too many activities to participate in*". The technology-mediated access to the learning procedures which at first appeared "a game", came to present itself as an additional burden, especially to the less experienced students. In many cases, the difficulties were multiplied by the great amount of English-language materials which the students, Greek native speakers, had to deal with. Although English proficiency was a requirement for entrance into the program, working at an advanced academic level proved quite taxing for some students. By others, however, it was deemed a good opportunity to practice their English and improve it. The aspect of interdisciplinarity also posed a difficulty to some students, especially to some who were not at all familiar with a particular disciplinary approach. There was an overall positive reaction to the interactive forms of e-learning (group activities, chats, discussions, etc.), in contrast to essay and paper writing which was considered difficult and time consuming. As a response, many students requested close supervision and feedback by the tutors. Overall, it appears that students, coming from a strictly "conventional" educational system, needed time to familiarize themselves with the program's open, constructivist pedagogy offered by e-learning. Thus although they were motivated by the learner-focused environment, they tended to present single discipline or perspective monologues in the asynchronous *discussions*. After instructor feedback and partitioning in smaller groups, students became much more interactive, and in time critical and interdisciplinary in their work – on-line, as well as off-line.

C. Reactions to technical problems in an e-learning environment

As an on-line learning environment is always active, even minor technical problems or functional disorders become major problems in the educational process. Students in the first phase of the e-learning situation appeared quite anxious, and they needed immediate feedback and technical support on a personalized basis. It appeared that on occasion some problems could not be fixed by distance support and an on-site technical support was required. Special issues were raised because of the network-based learning environment. Students had to be always connected or in close proximity to (at least) a telephone line to resolve difficulties. Thus, it was not uncommon for some to lose their self-confidence as computer users, because of the technical problems they encountered. Students sometimes are not able to describe (by mail or phone) the technical problem or the malfunction of their system, or to assess whether they had followed procedure correctly or not (e.g. this was a common feature when they had to submit their first essay). Overall, students asked for standardized procedures and design, while even minor disorders or unexpected changes, made them worried. However, as a result of consistent and continuous support they received from the technical and administrative team on a personalized basis, almost all of technical issues that caused anxiety were resolved and stress was alleviated.

D. Communication in e-learning

Communication appeared to be a focal issue from the beginning of the course. Students were eager to communicate and act in groups, ask for technical support from more experienced colleagues, exchange relevant experiences or propose alternative modes of dealing with arising situations in the e-learning process. In doing so they were formulating informal groups of mutual support, according to specific characteristics such as the type of problems faced, area of residence, etc. The need for communication (individually or in groups) was frequently expressed and it had the explicitly stated intention of establishing closer personal relations among people who did not share the same physical space. Students saw such communication as an opportunity to work with people from different places, with different occupations and social backgrounds and to come together in facing uncertainty. A major issue that surfaced by the middle of the first semester was that students had been reluctant to contact tutors on matters related to the courses, as they considered this an uncalled for burden on the program's instructors. This has to be attributed to a peculiar ethos that has historically developed at Greek universities, whereby professors are only to be contacted in cases of immense crisis. Thus in some cases even minor problems related to course work accumulated. These student inhibitions were, however, aired and addressed in the first on campus gathering and they have not resurfaced since.

E. Strategies for managing the workload

From the very beginning of the course it became clear that students began developing personal strategies to deal with the problems which arose. The first major problem was that of managing the heavy work load, and at the same time meeting the fixed deadlines for handing in assignments or completing other activities. Most of them ended up covering only material which was necessary for the assignments, but they expressed serious concern about missing out on important material that they did not have the time to go through "properly". These problems were often magnified by the above noted reluctance to communicate with tutors. Once communication channels with instructors opened up, students started requesting greater "flexibility" in deadlines, work load, strictness in grading, etc. It is particularly noteworthy that their reaction to the above was often expressed in the form of jokes and self-sarcasm. In fact, their personal messages, with the extended use of informal language, have revealed people with a good sense of humour (something which often made them popular with the group). As it turned out, systematic use of the platform's daily academic calendar appeared to be a very useful tool in keeping students on track with the multiple activities, assignment and assessment procedures, progressively published learning modules, and so on.

F. Difficulties arising from the familiar and social environment

The majority of students at the time of their study had to comply with other responsibilities as wives, husbands, mothers, fathers and professionals. This often caused strains and conflicts between roles that had to be fulfilled simultaneously. This was particularly true for a group of working mothers, as a result of the ever-present uneven distribution of duties responsibilities between men and women in the Greek family. These people have complained for difficulties in scheduling, in synchronizing with others and limited time for study and communication. But above and beyond these problems, almost all of the students explicitly remind each other that they would not be able to pursue post-graduate studies were it not for this particular program and its e-learning methodology.

Conclusions – Policy Implications

The qualitative analysis of the students' initial responses to this novel and on-going e-learning situation prompted the immediate reaction of the managerial and technical team. In effect, the evaluation process proved extremely valuable and it has acted as a *learning strategy* for the people who designed and implemented the particular project. As all the major issues that merited attention were addressed head on, lots of tensions and anxieties were resolved, although some remained outstanding as they had to do with the very nature of the course, such as the use of theory and research in English. In any case, the qualitative analysis of the data gathered from multiple sources allowed the managerial team to act swiftly and to modify problematic areas thus creating the best possible prospects for the successful completion of the course.

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USING A CYBERNETIC LEARNING MODEL TO SUPPORT FORMATIVE ASSESSMENT AND DIAGNOSTICS WITHIN AN INTELLIGENT VIRTUAL LEARNING ENVIRONMENT

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It is arguable that the concept of a Virtual Learning Environment (VLE) and its main components and features are well understood. A number of standards define their structure, components and interoperability [1]. However there are still questions to be asked as to how such environments can be effectively used in a variety of learning contexts. In fact we can go as far as to say that in some contexts the accepted model of a VLE might not provide a feasible solution at all [2]. A VLE might not be defined for the target user group, it might make certain assumptions about the learning process or be based on a learning model or paradigm not shared by the tutors or learners. Also most VLEs lack intelligence, being largely collections of learner management tools rather than an intelligent tutoring system. Consequently both the RIME and SNCRU groups at Teesside, UK have been looking at alternative interfaces, methodologies and approaches to communication, collaboration and knowledge creation [3, 4, 5] which might provide added value to specific learning processes or user groups. The work at Teesside has largely been under the supervision of Dr Elaine Pearson and Dr Steve Green. Dr Pearson's has concentrated on the areas of accessibility, usability and the application of learning managements systems and VLEs to people with severe and multiple disabilities. Dr Green's work has centred on technical issues and those of configurable and adaptable VLE design.

In parallel with this, a group at TU Gabrovo, Bulgaria have been exploring control theory as a mechanism for developing a cybernetic model of learning and formative assessment. This has been an area of investigation over the last few years under the direction of Professors Evginiy Skopalik and Lilyana Nacheva-Skopalik. Over the last two years these groups from Bulgaria and the UK have been collaborating on the ideas of intelligent agents with a view to embedding a cybernetic learning model as a formative assessment and diagnostic tool within a virtual learning environment. This paper presents this latter concept as a new component of an intelligent Virtual learning environment (iVLE).

Forms of Assessment

Assessment is an important and necessary component of a VLE according to most accepted standards. At the same time assessment is arguably the most difficult area to realize and the most controversial part of the learning process. Assessment methods and tools should conform to the specific teaching course requirements and its learning outcomes. Certainly, the approach for technical subjects and the humanities, for an academic module or a short refresher course, and for an additional qualification would differ; this could depend on the degree of theoretical and practical elements. However what is common and important is to define what exactly the assessment procedures are trying to achieve.

Very often the assessment is used for summarizing the student's achievements. Specialist teachers and researchers working in the areas of assessment call this type of assessment *summative assessment **(SA)***. Summative assessment gives "feed-out" – namely a kind of a document: perhaps a certificate, diploma or license of some kind.

An alternative form of assessment can be used to determine the level of the learner at the current point of his learning with the aim to help define what he needs to do to improve his understanding and performance. This approach is known as *formative assessment **(FA)***. Formative assessment gives "feedback" to the student concerning his level of performance or achievements. Assessment that can diagnose and detect barriers, problems, difficulties to learning is a variety of the FA as well which we can refer to a *diagnostic* formative assessment. Diagnostic FA is very useful and of a great importance for the learners, although it is not currently common practice in higher education. Research shows that FA can really improve the learning experience.

The Cybernetic Learning Model

The most effective FA can be achieved when it is not an end in itself, but an integral part of the whole learning process – teaching, learning, assessment. It this sense, if there is a complete strategy for teaching-learning-assessment and each part is very carefully planned and thought out FA could be expected to yield good results. The learning technologies used in the VLE mostly promote what is often called active or collaborative learning. A typical feature of the use of this technology is that the learners have the active role in the learning process. The teacher is mostly in the role of consultant, arbiter or learning facilitator. Also with a VLE direct face-to-face contact between the teacher and the learner is often very limited. Contact is typically indirect via available communication tools. In most of the existing VLE the feedback loop to the learner is closed through tutor participation. However our position is that feedback should be based on "formal and objective" parameters which can be observed and measured in the context of the "virtual" contact with the learner. This can be viewed as a "black-box" model of teaching, learning and assessment.

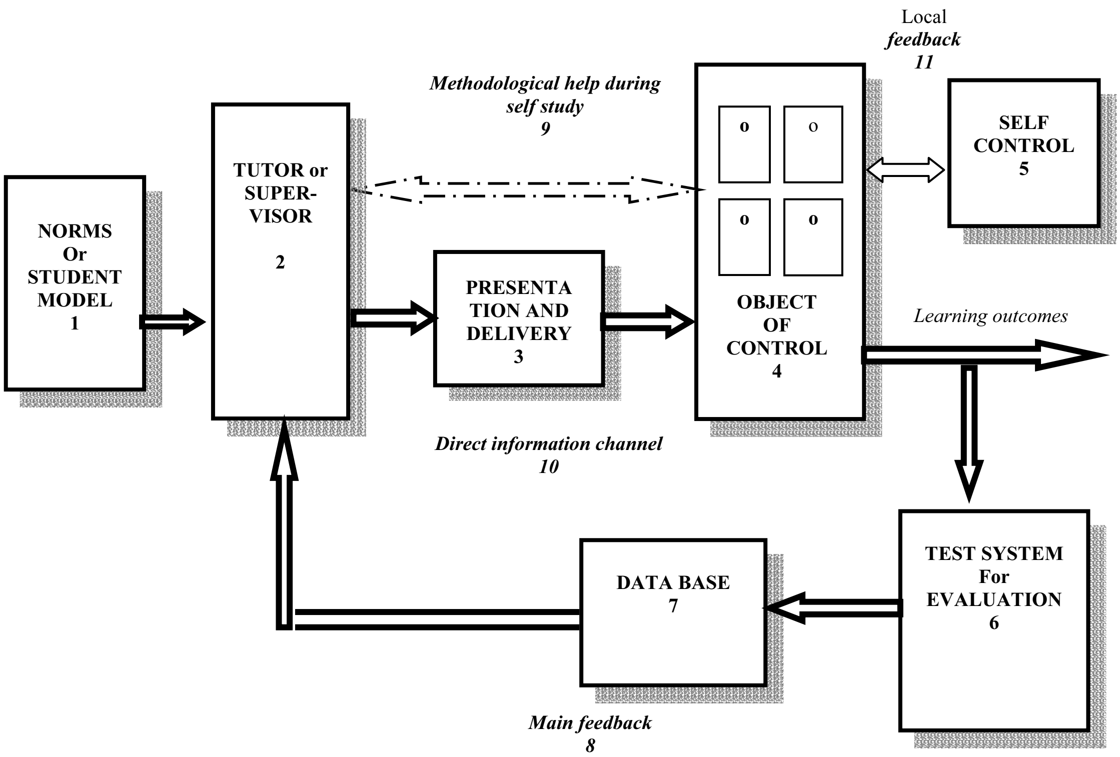

Figure 1. The cybernetic learning model

Figure 1 shows how this cybernetic learning model fits into the teaching-learning-assessment process. The main components of the system are the tutor (2) the object of control (4) which in this case is our student or group and the test system for evaluation (6). The other components such as the student model (1), delivery (3), tests for self control (5) and database of questions and results (7) represent the teaching materials and supporting elements within our model. Some of the major information, feedback and control flows (8, 9, 10, 11) are labelled to indicate the main areas of communication relevant to the tutor and student. Feedback (8 and 11) is primarily automated whereas the primary communication channels between tutors and students (9 and 10) may be indirect electronic channels, particular for distance learning or when employing a VLE. Achieving effective FA, using relatively simple tools, would be an essential positive feature of a VLE. Moreover if this FA could be automated to some extent, the VLE could be viewed as a type of intelligent tutoring system.

After analysing the education system in Bulgaria, we propose a hierarchical structure of education (the national education system, university sectors, disciplines, learner groups and individual learners). The premise for this research is also that the cybernetic model of the learning process provides a useful starting point for automated assessment:

- direct information channel – knowledge presentation;
- local feedback – self tests (FA);
- main feedback – assessment (FA or SA).

The objects of control are different at the different levels of the hierarchical educational structure. This research deals with the two lower levels which are the single learner and the whole learning group. The goal is to provide learning and teaching support using tools for FA and diagnosis of the students' status during learning (control of the learning process).

The control model

It is a well-known fact that the simpler the system the more reliable it is. Bearing this in mind the use of a very easy to approach tool is suggested for the purposes of formative assessment and control of the learning process. The first step is tracking the results and behaviour of the learner during his learning. The question is what do we need to track or measure? If the goal is achieving control of the learning process by a semi-automated process, formalization of the parameters is necessary. This is a part of the process of identification of the object of control – the learner. During the research a number of very important features (parameters) of the learning process were defined. A method from multiple criteria decision making theory was applied to define the weighting coefficients for these parameters. The results show that there is concordance in the specialists' opinion and the suggested parameters are well-grounded, objective and significant, and they can be used in the algorithm to give feedback and learning support to the learner according to their weighting coefficients.

In its basic form the control algorithm can be defined by a simple black-box model. However, as the learner is a biological object, the standard identification methods normally applied to the automation of inanimate, technical objects are not suitable or applicable. This is why an approach to evaluate objectively the subjective *experts' opinions* was used [9]. As a result a large number of parameters and variables was reduced to those most relevant. Only those parameters were selected which were essential to provide a sufficient level of diagnostic and information feedback and to form the input control actions in the system. The scheme of the chosen system is presented in Figure 2 [9]. The output parameters are: y_{1i} (knowledge evaluation mark), y_{2i} (skill evaluation mark), T (time for the learning), T_g (Total time for the course), T_i (intermediate time for each topic); the input parameters are $Q_{i,}$ (quantity teaching material), A_i (administrative influences), P_i (psychological influences); Si (disturbance influences).

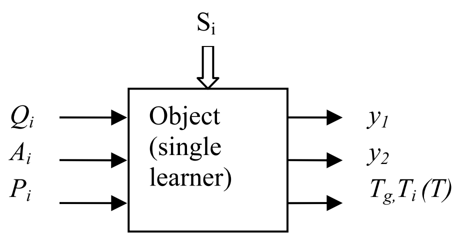

Figure 2. Learning control model black box

A main precondition for the choice of parameters was also to what extent the different parameters can be objectively and technically evaluated or measured. It should be highlighted, that there is no direct teacher-student contact in distance teaching and the teacher's intuition, experience and direct psychological and pedagogical influence cannot be applied. This fact constrains the student model and at the same time predetermines the input actions: the quantity of the teaching material depending on the student's advancing; forming of psychological influence-encouraging, warning, directing etc; administrative influence-financial sanctions, temporary stop of the education or even suspending, according to administrative regulations.

There is no doubt that the object of control has numerous, fuzzy parameters whereas the control model has to be logical. It is necessary to clarify the main regulations, criteria and requirements of the education norms (legislation). The learning and diagnostic strategy have to be based on this legislation. Our main directions are:

- objective and fast evaluation, partially or fully excluding subjective factor;
- just in time diagnostics aimed at effective and active support of the learner in order to achieve the best learning outcomes;
- active feedback and good teacher-learner contact.

Requirements which relate to the direct information content and the quality of the teaching material are not discussed here, but taken as necessary precondition. To achieve requirements above, as mentioned previously, a test system was developed [10]. The detailed description of this test system forms an outline formative assessment and diagnostic strategy.

Evaluation, Diagnostic and Assessment Tests

To gather some of proposed parameters a kind of assessment tool needed to be used. After an initial requirement and needs analysis a simple form of multiple choice test was chosen. While it is understood that for many purposes, such as summative assessment, multiple choice tests are not considered ideal, for our purposes they are adequate. The essential point for the proposed solution is not to use single tests, but a whole well planned and thought out *system of tests*. They are used to gather data for the purposes of FA and diagnosis (control of the learning process). We call the suggested test system a "crawling test system".

A crawling test system relies on a well understood statistical technique used in control engineering to monitor quality in manufacture and production. A simple moving (or crawling) average based on a subset of recent measures is used as a basis for comparison against current measures to help determine current trends. For example the mean of three most recent measures is used as the basis to determine whether the control parameters need adjusting to move the next measures within tolerance or towards the accepted norm. In our case it is used to determine a *pedagogic trend* (effectively to determine whether the student is learning).

The "crawling test system" includes: initial test, self-control tests, tests for knowledge evaluation and tests for knowledge evaluation and diagnosis.

Initial test (IT) – the goal of this test is to define the level of the learner's preliminary knowledge.

Self-control tests (SCT) – these are useful for the individual learner to have an idea about whether they are advancing in learning; these provide test results for the learner only.

Tests for knowledge evaluation (TKE) – these provide data for both the learner and the teacher. The main features of these tests are they are time limited. A new test is given after each topic in the teaching material. The tests are individual but equivalent for each student. The questions have different "weights" or difficulty levels and a random selection of questions asked based on these weightings. We apply games principles for positive and negative reinforcement. The unanswered and wrongly answered questions are registered and a "crawling effect" applied to calculate the scores. The exact tests scores and evaluation marks are not crucial to the final result for the teaching course, but they are absolutely necessary for the FA algorithms.

Tests for knowledge evaluation and diagnosis (TKED) – Evaluation and diagnostic tests allow us to detect concrete weaknesses, difficulties, problems, and individual lapses for each learner. The student poor performance can be detected using the trend of his performance. Information about the topic from the teaching material, the laboratory or practical session, the piece of homework attempted, etc. all effect the results. Additionally, to create the diagnostic tests it was suggested all questions should be classified by type. The type of questions would give very useful diagnostic information for the student status. Multiple criteria decision making theory is used to define the weighting coefficients for the suggested type of questions. The results show that there is concordance in the specialists' opinion concerning the suggested types of questions. These results are objective and well-grounded prerequisite for creating diagnostic tests based on the suggested type of questions. The received weighting coefficients should be analyzed and used in the algorithms for automatic generation of the feedback and advice to the student (learning process control).

The idea is to extend the analysis of all results from the "crawling" test system and to use them in an appropriate way as a very specific kind of FA, giving feedback to the learning group as a whole. We call this stage-learning process control at the second level (whole learning group).

This system is probably best used in technical and engineering subjects, where mastering the teaching material as a linear sequence is a common requirement: this is because topics are connected and build on each other. Other disciplines can also adopt this approach if a defined sequence can be identified. However the system has not been tested on subjects where the teaching sequence is largely arbitrary, consequently a refinement to the model may be needed for more effective learning process control in this context.

Current Findings

Initial experiments with the test system have been conducted with students on the subject "Automatic Control Theory" within the Mechanical Faculty of TU-Gabrovo over the last three years. Generally, these experiments proved successful. Results indicate that the chosen approach is appropriate and renders measurable results correlating with improved student performance. Additionally practical experience has highlighted areas to be corrected and improved. A system of tests for knowledge evaluation and diagnosis (TKED) is the most recent development. The TKED model has been verified with simulated test results. An experiment with TKED in a real learning process is expected to be held soon. It is important that during the experiments the authors collect some useful information concerning the students' attitude to the test system, their reactions while using it, some advice and opinions. The initial teacher effort to create the test questions, especially for the TKED, is rewarded by the facility to trace the students learning and to support the students effectively as an automated or semi-automated process. It is especially important for large student numbers. The questions from the test system can be used repeatedly, with periodic additions and amendments.

The next step is to extend the analysis of all results from the "crawling" test system and to use them in an appropriate way as a very specific kind of FA and diagnostic, giving feedback to the learning group as a whole. We call this stage-learning process control at the second level (whole learning group). The control algorithm for learning groups is currently being refined.

Conclusions

In their different ways both the Teesside VLE and the Gabrovo diagnostic test systems have posed a number of interesting questions, which are not fully answered; our experiences are based on limited experimental data (although supported by extensive anecdotal evidence). To understand the concepts of an intelligent Virtual Learning Environment (iVLE) further work is needed primarily in the two areas of tutor-student communications and automated student feedback. Gilly Salmon's e-moderating principles [7a] give a good insight into how to establish etiquette, communication and culture within an on-line course but generally little is said in the current literature on the role of an intelligent tutoring agent or diagnostic test systems. Most of our use of the VLE within Teesside can be considered as "blended" delivery involving mechanisms other than e-learning [7b]. While this might be considered a sensible approach we still need to develop further e-learning components to complement or replace our range of VLE facilities and to add intelligence. In particular we need to explore assessment and feedback systems in detail. This is the basis of the Bulgarian-UK collaboration. However currently we are very far away from defining the relevant components of and intelligent VLE. We believe we have started to explore some simple intelligent formative and diagnostic assessment agents. We hope that eventually this work will help us define the components and use of an intelligent VLE.

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LEARNING FINANCIAL ACCOUNTING AT A GRADUATE LEVEL AS A FULLY ONLINE ENVIRONMENT

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Introduction

While online teaching is gaining acceptance as an alternative option to the traditional campus-based experience, it also creates new challenges and opportunities for the design and delivery of post high school education. For the student online learning means increased access and flexibility as well as the combination of work and education. It may also mean a more learner-centered approach, enrichment, higher quality and new ways of interaction. For campus-based universities the main potential of online courses is to increase the cost effectiveness of education, to reach target groups with limited access to conventional education and to support and enhance the quality of existing educational delivery.

In keeping with leading universities worldwide, Bar-Ilan University (BIU) has begun incorporating internet technologies into its academic, campus-based teaching in recent years. The well-developed internet infrastructure allows for innovative learning and teaching possibilities that are neither time dependent nor location dependent. Students can attend lectures and participate in sessions from a PC connected to the internet (at home, at one's workplace, or at any other location), without having to get to a classroom or gather in a common geographic location. This enables the utilization of time-delayed educational activities, in which the instructor and the students are not limited to a pre-scheduled lecture, but can participate at their convenience.

BIU is one of the largest campus-based universities in Israel. Its student body numbers some 30,000. The university offers 6,300 different courses, taught by 1,500 members of the academic faculty

The current exploratory research focuses on a core course in the MBA program at the Graduate School of Business on Financial Accounting, which was delivered as a fully online course. Financial Accounting is an excellent course to consider as a candidate for an online delivery. Many students find it particularly difficult and have the need to review the material multiple times; others find it particularly simplistic. This difference, in our opinion, is what makes Financial Accounting a particularly good 'candidate' as an online course as it offers students the flexibility to review the materials and participate in course assignments anywhere any time.

Two main characteristics of teaching courses such as Financial Accounting are also those of conventional face-to-face teaching:

- It is customary to teach and learn the contents using separate modules. At the end of the learning process these modules are found to be mutually dependent, and form a comprehensive, overall understanding of the material.
- Focusing on theory is only a part of learning. Practice and exercises are required to reach a deep understanding and to internalize the subject matter.

The research literature describes these characteristics as central conditions for effective teaching and learning using e-learning technologies. Among other things, these technologies support the forming of learning communities (for further discussion of these and other characteristics, see Palloff & Pratt, 1999).

The Financial Accounting course was fully online (no face to face meetings) and was designed to be asynchronous, so that each student can study on his/her own and independently. The course reading material and discussions/questions within forums were online. In addition, homework was submitted by students online (and solutions were thereafter posted online). Finally, to assist students, recorded audio sessions were uploaded to the course website. The students receive frequent on-line support from the instructor both through the website as well as by email.

The main objective of the current study is to study students' attitudes toward this course including:

- their overall satisfaction with the instructor and the course;
- their opinions on the use of various technology options of learning;
- their views as to the learning process in a specific course, comparing the online environment with a face-to-face environment.

Literature

In their research, Kretovics & McCambridge (2002) discuss the extent to which student learning was influenced by one of three distinct types of instructional delivery: traditional on-campus, face-to-face (f2f) instruction; distance education (in this case, distribution of video recordings of on-campus classes combined with online faculty/student and student/student interaction), and executive education (f2f, cohort). They found that distance MBA students self reported significantly higher scores than on-campus students on the learning outcomes related to technology, quantitative, and theory skills, and higher scores on technology skills than the executive MBA. They suggest that a virtual community, if developed properly, can serve student needs as adequately as more traditional notions of classroom community and "seat-time". Additionally, the results not only support the notion that distance learning is effective, but they also challenge the "no significant difference" research findings by indicating that distance students may, in fact, learn more that the traditional classroom based students.

Similarly, Carey (2001) suggests that online students are gaining knowledge comparable to the face-to-face students and that the online students are as satisfied on most dimensions as the face-to-face students.

Researches argue that no single approach is best for the design of technology-based learning environments (Sfaard, 1998; Spector, 2000). However, Howland and Moore (2002) state that it is important to examine students' experiences in internet-based environments to provide optimal learning for successful learning outcomes. They found that learners who report positive attitudes about their learning experience exhibit higher levels of independence and responsibility for their own learning. In addition, the type of technology used in the online learning environment was particularly important in the decision as to whether to choose online learning (Rangecroft *et al.,* 1999). Thurmond *et al.* (2002) found that students are increasingly demanding multiple ways of learning.

Researchers discuss the advantages that may be achieved when using asynchronous technology for the learning process. Berge (1997), for example, notes that asynchronous communication is time independent and permits 24-hour access to other people and resources. It may be more convenient for students meeting work, family and other responsibilities. Another advantage, according to Palloff and Prat (1999) is that members have the luxury of time. Postings can occur at the convenience of participants, allowing them time to read, process, and respond. However, along with no set times for class comes the responsibility of the students to be self-motivated in their learning habits.

Data

The data is based on semi-structured (open-ended) interviews with students. Saba (2000) considers interviewing of students as one of the newer and better methods in distance education that overcome many methodological and theoretical limitations.

The interviews' qualitative analysis is based on *grounded theory procedures* (Strauss and Corbin, 1990). A grounded theory is one that is derived from the study of the phenomenon it represents. That is, it is discovered, developed, and provisionally verified through systematic data collection and analysis of data pertaining to that phenomenon. "One does not begin with theory, then prove it. Rather one begins with an area of study and what is relevant to that area is allowed to emerge" (p.23).

The data collection was done in June 2003 (after the course ended, but before the final grades were published). Complete interviews were conducted with18 students (a 75% response rate). The six students who did not complete the interview failed to do so because of scheduling conflicts. Each interview took 20-30 minutes.

Findings

Overall satisfaction with the instructor and the course

Sixty four percent (64%) of the respondents gave high positive scores to the instructor:

- *He is an organized, very "to the point" instructor. He is much better online than in class.*
- *He has a very nice (online) personality.*

The subject matter also got high positive scores (74%), mainly as it perceived to be relevant to the students' work life, and because the learning materials are well organized:

- *The subject matter is relevant to my job, I learnt a lot [...] I work in business development.*
- *The learning materials were well organized, and as the course progressed, everything connected became clearer.*
- *The course's format was simple, organized and user friendly. It can be said that the subject matter is indirectly relevant to my job. The subject matter itself was interesting.*

Flexibility of the learning process and 24/7 accessibility to study materials were frequently cited as contributors to the students' satisfaction:

- *For me the course was perfect, as part of the time I'm abroad. Even abroad I could study and post the assignments on time.*

Opinions on the use of various technologies

The study materials included textual lecture notes (in pdf format to protect the integrity of the materials) and assignments. Other study materials included audio lectures where the student hears the instructor over a power point presentation and solutions to assignments. Both the textual study materials and the audio lectures received high positive scores (56%), though some of the students said that they prefer the text over the audio:

- *I work with computers. The main advantage of PDF is that you can read the file on every computer's screen without any difference [...] I think that the current format of study materials is excellent. You can hear the instructor and go into details with the text.*

Students who preferred the textual lecture notes over the audio lectures explained:

- *It was great reading the lecture notes. I didn't use the recordings, I preferred the text [...] it's much easier for me to look at a written text [...] when you listen you might loose [...] with the text if you don't understand a word you can open a dictionary.*

Students who preferred the audio lectures over the textual lecture notes argued that the fact that they could not print the PDF files was the main reason for their preference of the audio lectures:

- *I tried to read, but the files where too long and couldn't be printed [...] the audio lectures helped me understand the overall subject matter, and were the main learning source for me.*

Comparing the online environment with a face to face environment

Sixty percent (60%) of the students said that they prefer a face-to-face course over an online course. The main reasons indicated for their preferences were: the need to get used to a new method of learning, and the lack of immediate interaction with instructor, as it happens in a face-to-face class:

- *I prefer a face-to-face course. I am conservative […] it is hard for me not to be able to stop the instructor while he is talking, and get an immediate answer. It is hard to learn like this […] it takes more time to learn online.*
- *Some students asked questions, and until we got answers it took time. Sometimes the answers were too concise. Once I sent an e-mail to the instructor and it took him too long to answer.*

Having said that, even the students who preferred a face-to-face course repeatedly said that they acknowledge the enormous advantages of an online course: the opportunity to learn anywhere, anytime, and the accessibility of study materials.

Summary and Future Research

The current research aimed to study graduate students' perceptions toward learning in a core course in the MBA program at the Graduate School of Business on Financial Accounting, which was delivered as a fully online course. We studied their overall satisfaction with the instructor and the course, their opinions on the use of various technology options of learning and finally we asked them to compare their learning process in the online environment with the face-to-face environment. The data is based mainly on qualitative analysis of semi-structured interviews with 18 students. Overall, the results documented positive experiences and opinions of students and it demonstrates the potential for using the online mode in higher education. The research described here is the first phase of two. In the second phase, which is currently in progress, we study students' perceptions in the same course delivered in the following year. This phase is based mainly on quantitative research methods. More than 100 students were interviewed using a structured questionnaire, which included open and close-ended questions. In the near future, we hope to report the final results on both phases.

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BLENDING METHOD, MODE AND MEDIA: PILOTING RICH AND LEAN COMMUNICATION MEDIUMS FOR ON-LINE AND DISTANCE LEARNERS

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Abstract

In 2002 Liverpool Hope University College successfully bid for European monies to co-ordinate and manage the EEEYMS project – European Enhanced Early Years Management Scheme. This project is set to design and pilot an on-line/distance learning degree programme for professional managers in the Early Years sector across Europe. This paper will report on the project's evaluation of a range of learning technologies and media with two pilot groups. It will question the received wisdom that e-learning with its 'lean' communication processes (Daft and Lengel, 1984, 1986) is an inferior environment for learning when compared to more traditional modes. It will describe two separate cohorts of professional managers all working in the UK's Early Years sector, one of whom were exclusively 'on-line' learners and another who commenced their studies in a traditional face-to-face 'taught' mode. The learning and teaching methods and modes experienced by the 'traditional' students were changed as a direct result of our experiences with the 'on-line' group but these changes were generally poorly received. The method and mode approaches used with the 'on-line' learners did not change dramatically, but the media did, as they moved from some synchronous communication in chat rooms and predominantly asynchronous discussion in on-line 'forums' to 'richer' more innovative communication mediums including audio-conferencing, narrated PowerPoint on-line lectures, e-books and CD-Roms. The paper will analyse student evaluation of these new media and their appropriateness as a means of learning. It will also compare the reactions of the 'traditional' and 'on-line' groups to the adopted learning and teaching methods, modes of delivery and choice of media and consider the implications of this research for the future design of on-line and distance programmes.

Introduction

In 2002 Liverpool Hope University College was awarded a European funded 'Leonardo' grant to co-ordinate and manage the EEEYMS project – European Enhanced Early Years Management Scheme. This project is set to design and pilot an on-line/distance learning degree programme for professional managers in the Early Years sector across Europe. New modules were written for this project and they have been initially piloted with two groups of Early Years Management students, studying on the B. A. Nursery Management programme at Liverpool Hope University College.

Of the two pilot groups one group were exclusively 'on-line' learners. They had met face to face at their initial weekend induction in 2003. At this event they were trained in the use of our virtual learning environment (Learnwise) and introduced to the chosen method of learning and teaching adopted by the programme team – problem based learning. The students henceforth commenced their studies working in virtual teams on given sector-related problems.

The second group commenced their studies in September 2002. These students were professional managers working in the Early Years sector and living in, or within travelling distance of, Liverpool. They met weekly and were initially taught using traditional methods, using lectures, seminars and visiting speakers. Following the teaching team's evaluations of programmes using problem based learning (pbl) however, it was decided to introduce these methods into the existing 'traditional' B. A. Nursery Management students' programme. This commenced in September 2003.

The team were well aware that a change to pbl can be an unsettling experience for many students as it amply found in the literature. There was indeed some initial disquiet at this change; however all students remained on the programme and their previous grades appear to have been unaffected by this change. Both groups of students were constantly monitored and evaluated and it was found that the 'on-line' learners appeared to work more effectively, taking a clear approach to each problem and generally scoring higher grades than the 'traditional' group. It was therefore decided in September 2004 to introduce the use of the virtual learning environment to these students, to see if they would benefit from replicating the 'on-line' learners experiences. It was believed that they may welcome this opportunity as all were mature students, with full-time jobs, many had families, and some had a considerable journey to and from Liverpool once or maybe twice each week.

Rich and Lean Communication Mediums

Daft and Lengel (1984, 1986) propose in their communication models that 'rich' communication media have the ability to transmit information, whilst conveying significant meaning, and therefore producing a reduction in task ambiguity. Rich media are seen to convey much of this meaning via higher levels of non verbal cues. This has given rise to a commonly held assumption within higher education that face-to-face communication is 'best' and the preferred environment for learning and teaching. There is a perception that co-located teachers with students, and students with students, provides the most optimal conditions for learning to occur. These 'richer' mediums in particular are believed to provide the best environment for problem solving and decision making. Indeed Schmidt (1994) notes

> "articulation of distributed activities that involve discretionary decision making will typically require, at least intermittently, various negotiation processes. For this purpose, conventional co-located 'face-to-face' interactions provide the required large bandwidth, not only in terms of gigabites per second but also, and more important, in terms of a rich variety of interactional modes with powerful and flexible social connotations".

Wijayanayake and Higa (1999) agree with this notion of 'richness' and classify media richness on a continuum from face-to-face, to teleconferencing, telephone, e-mail, facsimilie, and on to letters and memos. Nohria and Eccles (1992) also conclude

> "the viability and effectiveness of an electronic network will depend critically on an underlying network of social relationships based on face-to-face interaction".

The bias for the superiority of face-to-face communication is therefore quite evident. For communication within teams Daft and Lengle (1986) further discuss 'equivocality'. They believe that uncertainty is a measure of an organization's *ignorance of a value for a variable* ... equivocality is a measure of the organization's ignorance of *whether a variable exists* (1986, pp. 556-7). 'Equivocality' therefore needs to be overcome in order to encourage an effective learning and problem solving environment. The question here therefore would appear to be whether 'on-line' students can overcome the barriers of 'lean' communication mediums and find appropriate, sufficiently robust means of problem solving which considers the possibility of all variables and not merely the value of variables in their analysis. The literature suggests that face-to-face learning teams would not experience the same level of difficulty.

As Schmidt (1994) implies however the requirement for rich mediums of communication may be 'intermittent' which suggests that students may not necessarily need richer media all the time – but that these media could be useful at certain phases of problem solving e.g. when groups are initially 'brainstorming' ideas which would help to reduce ambiguity, interpretation of issues and actions, and then again at the 'assessment crisis' point – prior to submission.

This consideration prompted the programme team to consider richer media for communicating with their 'on-line' students and an attempt was made to replicate many of the learning events which the 'traditional' students currently received. All lectures delivered 'face-to-face' were also recorded and provided as an on-line resource, face-to-face seminars were replaced with 'audio-conferences', the newly acquired e-books were made available via an on-line portal, and finally some learning materials were made available on CD-Roms, but not reported in this case study.

Results

All students completed an anonymous questionnaire following the module; 'on-line' learners n=8 and 'traditional' learners n=14.

Students answered up to fourteen questions which examined their thoughts on the effectiveness of pbl as a method of learning, its appropriateness as a means of professional learning, the quality of tutor feedback, and their experiences of team working. It went on to ask about the media used in their programme and its effectiveness as a means of learning.

The analysis shows that all 'on-line' learners 'agreed' or 'strongly agreed' that pbl was an effective means of learning for them compared to 80% of the 'traditional' learners who 'agreed'/'strongly agreed', but 20% were 'neutral'. This suggest that there is still some reluctance amongst this group to adapt to this change.

The analysis of student's experiences with new and different types of media was particularly interesting however. The 'traditional' learners had used the virtual learning environment reluctantly and even when given the flexibility to attend/not attend tutor-less seminars at the university, the majority still chose to travel into the university and meet their team physically rather than communicate on-line. 'On-line' learners were clearly 'old hands' in the virtual learning environment and they expressed no problems, with a few favourable comments made such "great means of communicating with my group as well as expressing concerns/questions" with the whole class/tutor. It is nice when you realise the problems experienced are the same as others in the class and that other students (or I) can assist in answering them through previous learning or experience" and "yes, this excellent means of communicating with my group".

It had been the teaching teams desire to 'improve' the richness of the media available to 'on-line' learners which had prompted the innovations mentioned earlier and it was believed that these would be a welcome addition to the programme. This was generally found to be true but interestingly over 50% of on-line learners did not access the on-line lectures, and 25% were no more than 'neutral' to the statement "audio conferences are a good means of learning for me".

Discussion

Communication is aided in all professional education because of the shared range of 'background/professional knowledge' which is held by the participants. They are frequently already experts in their 'day-to-day' activities and therefore some 'meaning' already exists between members of the same group. However, merely 'reconstructing meaning' of each others communiqués is insufficient here. They need, as a part of the group pbl process, to act on knowledge. 'Using' that knowledge requires a deeper understanding than merely transmitting data – it requires a two way 'dialogue' where active participants can ask appropriate questions of each other and build a collective understanding. The results of student evaluations, and evidenced in their higher grade achievement, suggests however that the on-line learners have overcome the possible barrier created by the 'leaner' communication media and found a means of effectively exploiting these in order to succeed.

Communication theory classically suggests that what is communicated is not what the sender 'sent' but what the receiver 'received'. Active listening as a part of the 'rich communication' process is often overlooked. It is the author's belief that it is this factor which is particularly enhanced in an on-line environment and could be one of the contributory factors in the 'on-line' student's success. Communication is generally asynchronous allowing time for reflection and greater thought is allowed in the framing of a reply. Reasons for some 'on-line' students 'neutral' perception of audio conferences needs additional exploration, but when considering the potential 'culture shock' of introducing such a media, to an already successful group, it could be argued that this was asking them to perform a 'new trick' which they had hitherto not been required to consider or perform in.

A question the teaching team can now consider is whether pbl as a method of learning, with a blend of the appropriate modes and media, remove some of the necessity for face-to-face communication? PBL is less controlling than other forms of learning design and the student voice has more dominance. There is a possibility that the more immediate 'presence' of the facilitator becomes a barrier to student learning when they have grown accustomed to being autonomous self-directed groups. Richer media provide more immediacy in communication but in this faster pace more control is required and the facilitator may inadvertently assume more power in controlling the situation and therefore take away the learners ability for self-control.

Conclusion

Media richness has been proved to be insufficient in understanding the media choice process (see for example Carlson and Zmud, 1999) In Trevino *et al*, 2000, it was found that when individuals became familiar with certain types of technology they 'perceived' greater richness in it than was actually thought to exist. Burke and Chidambram (1999) suggest that frequent users of CMC could in time develop richness characteristics similar to face-to-face communication and it is suggested that this is what has occurred here. These inadequacies have given rise to alternative explanations for media choice, which are more collective and socially constructed.

It is the teaching teams' intention to now match the communication technology with varying stages in problem analysis and events, asking ourselves what interaction is necessary and how quickly a response is needed in determining when alternative communication media are made available. This could perhaps be left to the students to decide. It is apparent that rich communication media are not a constant requirement, and what seems to be the overriding factor for consideration is student expectation and previous experience along with their individual preference as learners.

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e-LEARNING FOR MATURE STUDENTS – OUTCOMES, BARRIERS AND SUCCESS FACTORS

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This paper is concerned with research findings emanating from a recently completed elearning project developed by Kingston University in collaboration with seven Further Education Colleges. The aim of the project was to investigate *how elearning helps to prepare for higher education of students from under-represented groups*.

The background to the scheme

This projects' aim was to provide VLE-based mentoring and course support for mature students studying in further education colleges with a view to progress on to undergraduate studies at universities. The majority of these mature students were the first in their families to enter higher education. They have family, work and societal commitments, in addition to study-related commitments. Apart from the support they receive from the college, they have limited access to cultural and social capital, unlike their traditional counterparts, enabling their progress to higher education. This project therefore, aimed to provide an extra dimension of support through a VLE and e-mentors, and to research the outcomes of, and issues emanating from this intervention.

The Blackboard VLE was used to deliver chosen modules, to facilitate tutorial support, and to support communication among students and tutors. A group of e-mentors, i.e. second and third year mature undergraduates, were also available on-line. The VLE provided an extra dimension of support for students who receive academic and pastoral support from their personal and subject tutors.

The students who took part in the project were aged between 21 and 50, were taking a one-year Access to Nursing and Social Work, Humanities, and Information Technology courses at seven Further Education Colleges. The project ran from Oct 2003 to July 2004.

Research questions and methodology

The main research questions addressed were:

- How elearning might contribute to (a) changes in attitudes and perceptions of higher education, (b) helping students negotiate higher education application procedure, and (c) assisting learners to become confident and effective learner?
- What outcomes might elearning bring into the teaching and learning context?
- What are the barriers for embedding a VLE in a Further Education context and?
- What makes students and staff engage with a VLE? What are the success factors?

Data were gathered from multiple sources using both qualitative and quantitative methods. Interviews were carried out with participating staff and students in the middle, and at the end of the project. A questionnaire was administered to students at the end of the project. Students' postings on discussion boards were also collated and analysed. Data analysis point towards the following findings.

How did the VLE contribute to the learners?

Changing attitudes to and perceptions of higher education

The introduction of the VLE and VLE-based mentoring helped the majority of students who used the system in changing their attitudes to and perception of higher education. Data from interviews, the questionnaire and the on-line discussion forums showed that the majority of students, at the beginning of their courses, were unaware of many aspects of higher education and its culture. As far as studying at university was concerned, the majority of students were unaware of the level of workloads, the nature of coursework, and the nature of assignments. They were unsure how they would balance their studies in higher education with the pressures of families and work. They were also concerned how they would 'fit in' with younger students. A minority of students on the Access had come back to a formal learning environment, without knowing what the Access course would lead to, and during the course they experienced uncertainties about their future. Interviews and final questionnaire data showed that, for a majority of students, the long-term association that they were able to establish with students from similar backgrounds from the university was helpful in informing them about university life, and in many cases, helpful to alleviate some of the concerns that they had. Students reported that they valued the inputs that they received from someone who was currently at university in comparison to advice from their staff whose experiences at university they thought were somewhat outdated.

Negotiating the HE application procedure

The VLE-based core modules and the VLE-based mentoring scheme were helpful for a majority of students in the HE negotiation procedure. Data from interviews with students and staff, and the students' responses to the questionnaire showed how the students were benefited. The weblinks within the VLE enabled a majority of students to make virtual visits to universities and acquire more information. Students on nursing and social work courses were able to ask questions of their mentors about their personal experiences of applying to universities, and to gain more preparation for admissions interviews. Inputs from mature students who spoke from their own personal experience of having gone through the application process successfully were valued by the majority of students.

Becoming effective and confident learners

The VLE and the VLE-based mentoring system added an extra dimension of help for students in their development as effective and confident learners. A majority of staff reported that the additional resources available on the VLE contributed to marked improvements in the way students carried out their learning tasks such as preparing for assignments and course work. Students also reported that the availability of the discussion forums also contributed to the development in their confidence to ask questions online and to contribute to on-line discussions. For a majority of students, learning to use a VLE for studying had contributed to their confidence as learners. Staff reported that access to VLE-based material enabled a minority of students to gain confidence in the subject areas, and contribute more positively in classroom discussions.

How did the VLE contribute to, and change the teaching and learning environment?

There were also a number of outcomes that need to be considered within the broader teaching and learning context of these colleges. Apart from one college where a VLE has been in use for some time, the introduction of the VLE added a new component to the existing face to face teaching and learning environment. The data gathered from the study point towards how this addition changed the dynamics of the face to face teaching and learning environment. The data analysis identified six changes.

Extra resources

The VLE and e-mentors provided extra resources, providing benefits to students who made use of the system. The VLE provided a mechanism for the staff to provide resources, both in-house produced course materials and links to relevant external websites, such as interactive material on biology. A majority of students were able to receive advice from their mentors with regard to books, referencing styles, tackling assignments, etc. Students on the nursing course reported that this was particularly useful in subjects with which they had less familiarity, such as Sociology and Psychology. Staff from one college reported that they were able to teach more effectively their part-time student groups who were based at their work places such as hospitals. For a minority of students, the on-line resources offered more flexibility – especially those with children who had to miss classes when their children were ill, or when they could not find childcare. They reported that they were able to access teaching materials from home and study independently.

Improved interactions

The VLE and e-mentors also contributed to the enhancement of existing communication networks between students and teachers and students and mentors. As far as enhancing existing interactions, staff from two colleges mentioned that the VLE triggered conversations at the beginning of classes, in the corridors, and in the staff room, etc. Staff mentioned that there was more email traffic from students and that generally these interactions led to better staff-student relations. Students also mentioned that they felt more like part of a community when they were reading and replying to each others messages.

Organisational tools

The introduction of the VLE added at least two kinds of organisational tools to the teaching and learning environment: the announcements and the calendar facility. Students from one college reported that these organisational tools enabled them to prepare better for classes, especially for those attending the college for just a few days a week. They were able to come to the classes with an idea of what was going to happen during the day. A staff member who made use of these tools found that they made her teaching and pastoral duties more effective.

Staff development

Staff engagement with the VLE also contributed to their own development of skills in using a VLE for teaching and learning. Staff from five colleges reported that the use of VLE during the course of an academic year enabled them to be more confident about their abilities and to learn new skills. Staff's statements such as "it has extended my IT skills", "it has just stretched me", "almost a life-chancing experience", "I've gone beyond my capabilities", "it has changed the way students see me and my knowledge", "that's given me a lot more confidence, the technophobia is gone", "it's opened me up into loads of different areas that I never thought I could do", "I think I have opened a little can of worms", "I've got into creating things now", etc., sums up the learning experience for staff members. Staff also reported that the opportunity to use the VLE within the project enhanced their own profile within the college; some staff went on to train their colleagues on the use of the VLE. In one college, staff reported that a diffusion process began to occur, and other staff also wanted to use the VLE for their teaching. Students in this college had contributed to this change by making demands on these staff to use the VLE.

Curriculum changes

The introduction of the VLE into the conventional Further Education setting required the staff to re-think how they might integrate the VLE into face to face teaching. At least in two project colleges, the staff were considering curriculum changes in the subsequent year in order to integrate the VLE component within core modules. These included allocating time-tabled sessions for training on the use of the VLE for various learning activities, using the VLE as an object/tool of learning in general ICT lessons, VLE-based learning activities in specific module related to improving students learning and studying skills, involvement of more staff from the Access team, and cross-module collaborations in terms of using the VLE.

Further Education-Higher Education Partnerships

Staff from two of the project colleges reported that the use of the VLE and mentors had a positive input on the on the Progression Agreements their institutions had signed with the university. These agreements, supported by the local Strategic Health Authority, were aimed at easing the progression of students from Access to Nursing programmes to the School of Nursing. The agreements made explicit: the entitlement to students of awareness and aspiration raising activities prior to their application to the university; the development of a fair and transparent admissions process including sensitive and appropriate interview practice; and a requirement for both institutions to consult and collaborate in curriculum development. There was evidence that the project contributed to the embedding and development of these agreements. The evidence from research findings in relation to the raising awareness and HE application process were used by the partners in their annual evaluation of the agreements.

What were the issues concerned with embedding a VLE in a Further Education context?

The data gathered and the observations made during the project period point towards three sets of factors that contributed to the success or otherwise of engagement with the VLE: (1) students and course characteristics; (2) gaining access to the system; (3) curriculum and staff issues.

Students and course characteristics

Unsurprisingly, observations of and interviews with students and staff identified a number of factors that acted as barriers for students engagement with a VLE. Students on Access courses lead busy lives, with family, social and work responsibilities. Time is scarce for them. The majority of staff and students reported that the courses that they were taking were demanding. The courses were typically ten months long. The students were expected to learn a variety of skills. The mixture of Access course characteristics and the profiles of the typical Access student inevitably meant that if the VLE was not embedded as an integral part of the course, then the students afforded it low priority and did not engage with it.

Gaining access to the system

Gaining access to the system proved to be one of the keys to engaging students with a VLE. Data from student interviews and responses to the questionnaire found evidence of two kinds of difficulties encountered in gaining access to the system. One was limitations in access to a terminal, either because of the low number of terminals or because allocated time was too short. Course characteristics and institutional policies regarding the ICT infrastructure contribute to these issues, some of which were highlighted in Stage 1 too. The second cluster of issues related to access identified were to do with students' technical competence and confidence in using the VLE independently. A variety of problems emerged such as difficulties with passwords, usernames, etc., that were also observed in Stage 1. While these acted as barriers to students' engagement with the VLE, staff in at least four colleges took steps to overcome these barriers. For example, in two of the college, staff provided step by step training for students. The majority of students also cited training as an important component, if they were to engage with the VLE.

Curriculum and staff issues

Evidence from the data gathered suggest a number of curriculum and staff-related issues contributed to the level of both staff's and students' engagement with the VLE. In two project colleges the system was used not to its full potential, staff indicated that the curriculum was not flexible enough to accommodate the VLE. Staff were not able to incorporate the VLE into the existing timetables and the curriculum. Interviews with these staff also indicated that they did not see how VLE might be integrated into the current teaching, and therefore, the use of VLE remained an extra activity. The majority of students from these colleges did not use the VLE, partly due to these reasons. In the four project colleges where overall usage of the VLE and VLE-based mentors was higher, the conditions and the approaches were different, as summarised under the following heading.

What made students and staff engage with the VLE?

In four of the project colleges, staff took positive steps to change the curriculum so as to accommodate the VLE. Staff in these colleges recognised that the VLE could not just be 'bolted on' as an optional extra; instead the staff took conscious steps to help the students engage with the VLE. For example, by removing some of the barriers to access, by providing step-by step training, by including VLE-based activities in time-tabled sessions. Rather than viewing VLE as an addition, or a threats to their current work, staff in these colleges identified at least five roles for the VLE and the VLE-based mentors: (1) as a tool to provide pastoral support; (2) as an organisational tool; (3) as a platform to provide learning resources that they themselves are not able to produce within the current arrangements (such as interactive learning resources); (4) as a mechanism to tap into the experience of current university undergraduates, and thereby creating a new dimension of interactions (student-mentor) and (5) as an object of learning itself, that would be useful for students' learning in the future at a university. Finally, staff in two colleges mentioned that they encouraged the use of VLE and mentors by reinforcing the message and by referring to VLE-based material and mentors in their general face to face teaching and tutorial sessions.

Thus, factors that contributed to students' and staff's successful engagement with the VLE can be summarised as follows:

- staff in a position to adjust the *curriculum* to accommodate the VLE
- staff seeing the *relevance* of VLE in the Further Education teaching context, and taking one or more of *five approaches*: (1) a tool to provide pastoral support; (2) an organisational tool; (3) a platform to deliver learning resources; (4) a mechanism to link with mature undergraduates from university; and (5) as an object of learning
- step by step *training* to students, and *follow up* training
- time-tabled sessions for the use of VLE
- *reinforcing* the message in face to face sessions

Concluding remarks

This paper provided a summary of the research findings derived from an elearning research project developed in partnership between seven Further Education colleges and a university. The Project's main aim was to use a VLE as a means of providing extra dimension of support to mature students' in their preparation for higher education. The research project found a number of outcomes for learners, more specifically, helping students to gain a better understanding of higher education and its culture, providing extra support in the higher education application process, and helping to develop as effective and confident learners. The research also found a number of ways the conventional face to face context has benefited by the introduction of the VLE. The data analysis identified six such contributions and changes. Finally, the research identified possible factors that contributed to the successful engagement of staff and students with the VLE.

These findings emanating form this research will be useful for our current understanding of the role of VLE-based teaching, learning and student support for mature students, and factors contributing to successful implementation of VLE in face to face educational settings.

LEARN-FLOWS – GUIDING ADULT LEARNERS TOWARDS HIGHER LEVELS OF COMPETENCE

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1. Introduction

"We must focus on the learning in e-learning." is a valid position [Hummel *et al.,* 2004, 116]. Frequently the e-learning discussion centers around technical aspects of learning management systems (LMS) like the LMS-independent structuring, packaging, and exchange of learning content. This technical perspective – and the accompanying standardization efforts – will yield benefits for content maintenance and the exchange of learning objects between publishers, educational services providers, and technical platforms in the coming years. But the technical discussions have to be complemented by the development of learning models and processes based on the rich knowledge from the field of human learning and cognition. Focussing the view on the learner and his individual efforts to accquire new knowledge and reach new levels of competency could, in addition, raise questions about the validity of present developments in the LMS arena. This paper will present the concept of learner-centric learn-flows (LCLF). LCLFs could provide an approach to model different andragogic processes and make them available in LMSs. At first, the co-constructivist learning model will be presented. Secondly, the idea to use learn-flows and learn-flow engines to drive co-constructivist e-learning processes will be discussed.

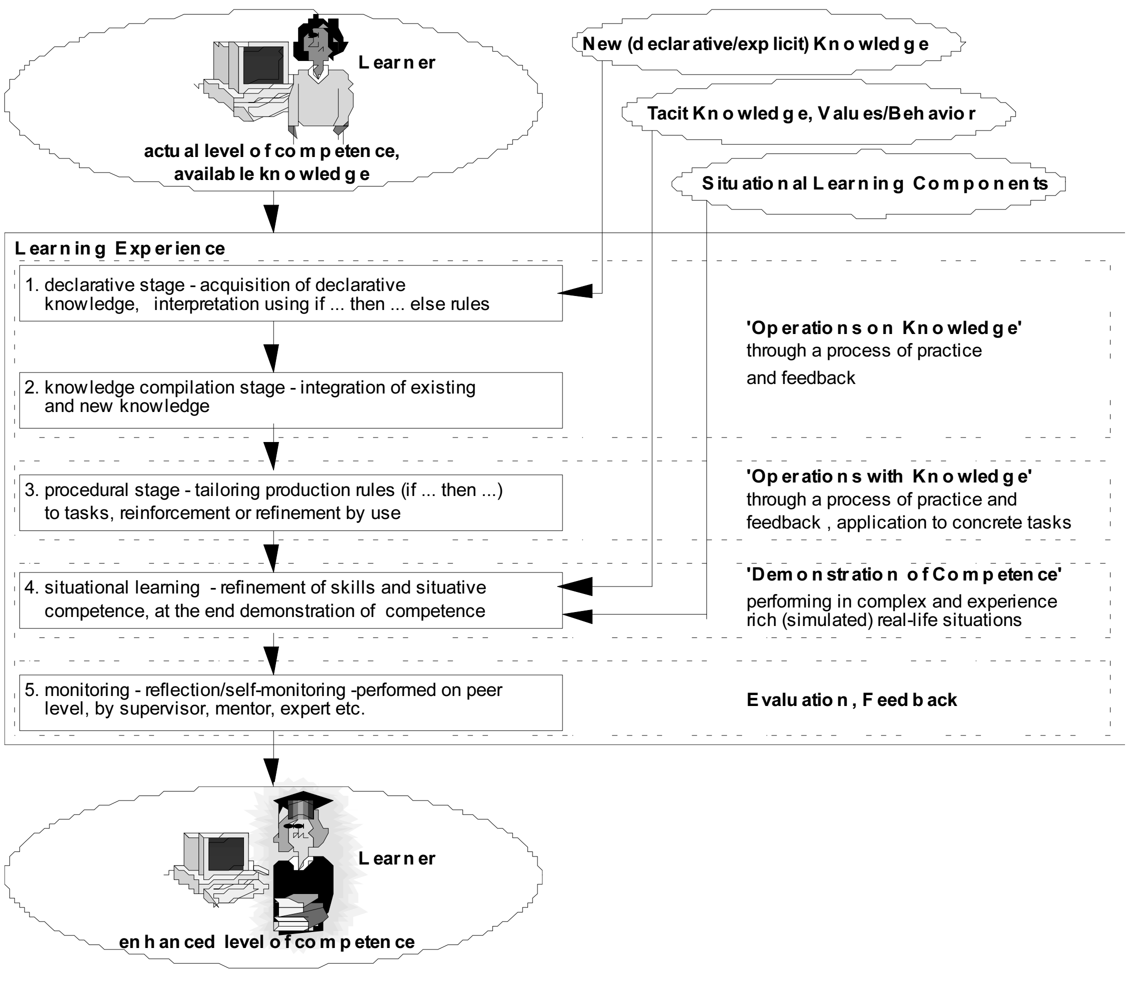

Figure 1. Learning Experience as a Cognitive Process

2. Co-Constructivist Learning Process

The co-constructivist learning model was developed by the author for adult learners who want to enhance job-related competencies [Finke 2000, 126]. Figure 1 outlines a model for structuring a personalized learning experience as a cognitive process – a single step forward on the individual learners more extensive journey towards a higher level of knowledge and competency.

Before a learner can be confronted with a new learning experience, his/her actual level of competency and corresponding knowledge has to match the prerequisites of the following learning experience. The learning experience then is structured into several consecutive steps (Figure 1) in which the learner at first acquires new knowledge (steps 1 and 2 – operations on knowledge) and afterwards (step 3 – operations with knowledge) applies the knowledge to more theoretical problems to integrate it efficiently with already available cognitive constructs. In step 4 the learner demonstrates his level of competency by tackling (usually simulated) complex real-life problems.

Because explicit knowledge (hard facts) sometime might be "only the tip of the iceberg", tacit knowledge ("highly personal and hard to formalize" knowledge) has to be learned or conveyed, too [Nonaka/Takeuchi 1995, 8]. If this is the case, social components of the learning process (interaction with instructors, tutors, or more knowledgeable peers) are indispensable [Finke 2000, 74; Luckin 1999; Vygotsky 1978].

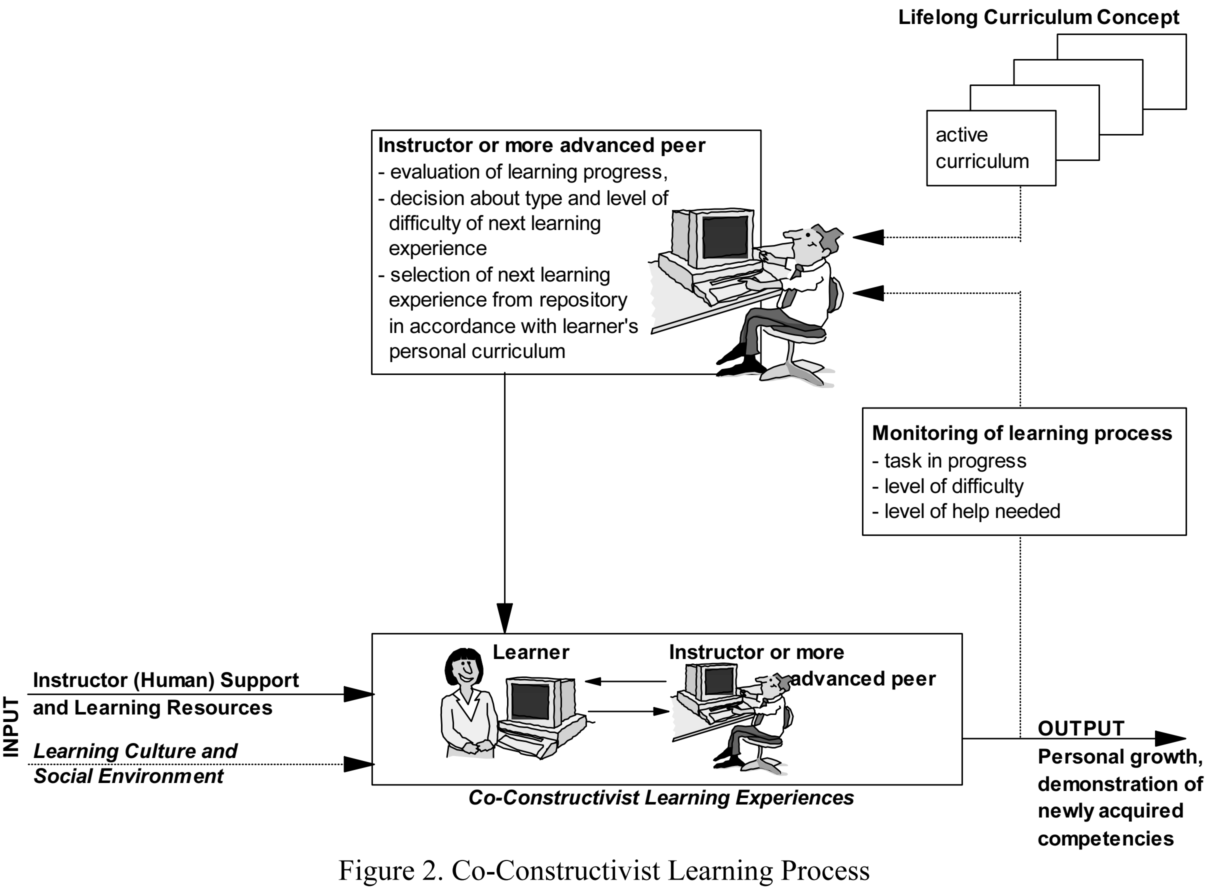

Figure 2. Co-Constructivist Learning Process

With regard to the learner/facilitator interaction the process works like this (Figure 2): The (master) teacher or the instructor assign a challenging task (with regard to the learner's present knowledge and competency) to the learner and supports him/her in its completion. By definition this approach to learning requires challenging tasks and significant human support for the learner to accomplish that task. At the same time the instructor monitors the level of support which the learner needs to complete the assignment.

After the learner has successfully completed a learning activity and reached a new level of performance (i.e. demonstrated a newly acquired competency), the next activity is assigned. The decision as to which activity to assign next is based on constantly monitored process parameters. Learning facilitator and learners (self-evaluation) are responsible for learning process monitoring, and process results directly influence the assignment of a subsequent learning activity (level of difficulty, complexity, remedial action etc.).

The following learning process parameters need to be monitored in the outlined model [Finke 2000, 131; Luckin 1999]:

- tasks the learner has already successfully completed and the active learning experience (incl. specification of situational task components, values, and professional behavior acquired/demonstrated, group/collaboration/role aspects of the tasks);
- level of difficulty of the tasks completed and the average difficulty of completed tasks;
- overall level of help needed;
- level of help needed most recently.

3. Learner-Centric Learn-Flow

The co-constructivist learning model outlined above, is based on the assumption that learners gain additional knowledge or competencies not by the simple reception of blocks of knowledge, but by constructing or re-constructing their individual cognitive concepts and learning to apply them to real-world situations via rich interactivity: Besides access to learning materials (e.g. delivered via 'reusable learning objects' RLO), collaboration with other learners, learn teams, learning communities, learning facilitators, or with the complex environment itself are vital ingredients of the co-constructivist learning process. If utilized in larger learning environments, the outlined andragogic concept (e.g. the co-constructivist model) has to be supported by an (Internet-based) e-learning infrastructure and additional organizational functions, resources, and educational services (e.g. electronic library, electronic learner work environment, administrative student services).

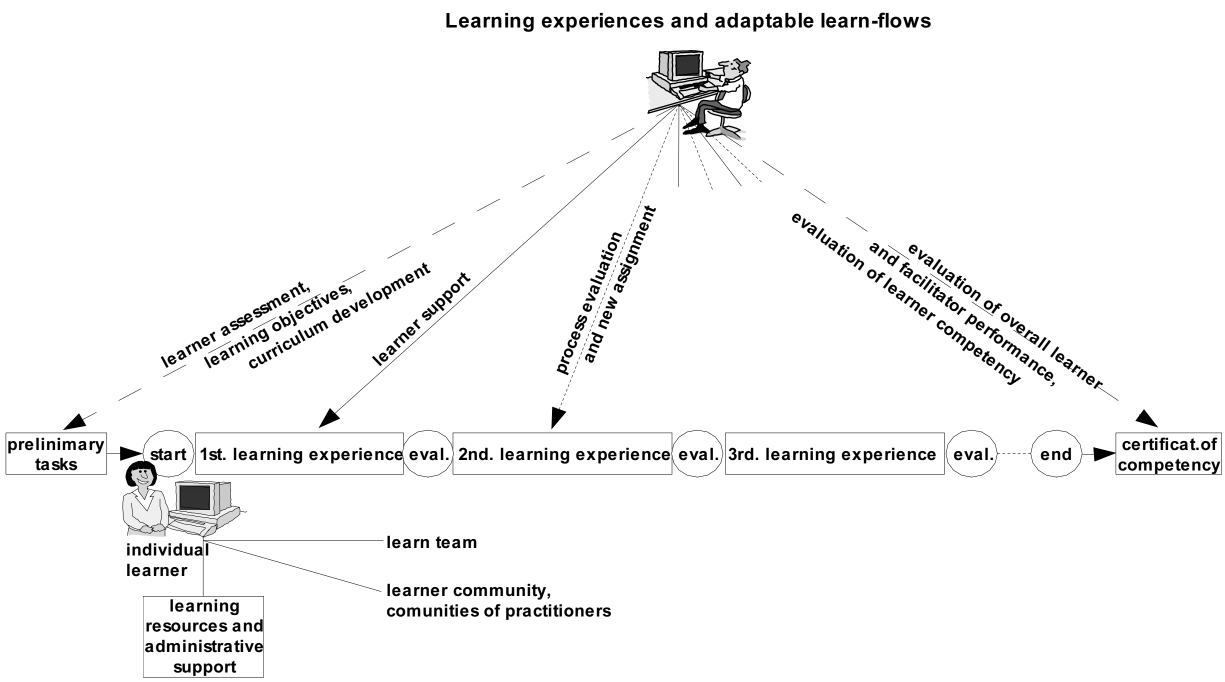

Figure 3. Learner-Centric Co-Constructivist LearnFlow

Figure 3 shows a learn-flow model of the co-constructivist learning process [Finke 2004]. After the learner's present knowledge and competency is assessed and his personal and situative preferences are evaluated a curriculum is generated which ensures that the learner can meet his learning objectives. The curriculum consists of a number of subsequent learning experiences which are based on RLOs. After the learner has completed a learning experience (worked through the materials presented by an RLO) his learning results and performance are assessed. If advisable the learning facilitator revises/adapts the curriculum and selects/assigns a subsequent RLO. The curriculum ends with the certification of the type and level of competency attained.

Instead of constructing 'standard' RLOs which tend to become – from a technical perspective – always more complex, we suggest that it is advisable to place a standard/modified workflow engine at the core of an Internet-based e-learning system. A workflow engine with sufficient flexibility could be used to support master teachers/learning facilitators to generate and manage personalised and adaptable learn-flows and could – during the course of an individual curriculum – grant the learner access to subsequent learning experiences, RLOs and related resources/services.

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DISTANCE EDUCATION MESSAGE TO E-LEARNING

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Abstract

This article deals with the broadly discussed problems concerning the importance of the e-learning platforms in the light of the learning processes and management of the e-courses. The author defines the principles of distance education as the base for implementing successful web-based study programmes.

1. Introduction

The progress of computerising all human activities has influenced the educational processes as well. After the enthusiastic period of Multimedia application in the '80s we are nowadays in the period of admiring the on-line teaching, virtual classrooms and interactive CD-ROMs. The obstacles of education via Internet or by using different types of interactive CD-ROM and DVD facilities are not technical problems. The real obstacles are the lack of pedagogic and didactic skills of teachers working with individual students. The expectations towards e-learning are higher, than real possibilities. The examples of e-learning applications are in many cases productive, but mostly not very efficient. Of course the big companies with the full Intranet facilities can benefit from the short-term on-line courses, what are namely organised without tutorial support and the final assessment is done by tests. E-learning is still not used for more complex learning processes with the formative role of the teaching institutions.

2. Present situation

There are a lot of commercial and not commercial applications of e-learning in the world. Different platforms (LMS) like Black board, Quick2learn, Topclass or Learning space serve the management of the e-learning organisations. The general advantage of these tools is their complexity in the sence of e-learning delivery, good communication environment and sophisticated reporting. The main disadvantage of these tools is that they were developed by computer experts and so they need the management of learning process by the providing institution. Also, these systems mostly offer the HRM support and career development of the staff. The effectiveness of such type of on-line education is that the costs are higher than of the costs of face-to-face training. The advantage of time and space independency of learning and teaching processes is disbalanced by the costs. The strong support by the different types of national funds and EC funding give opportunity to forget the cost effectiveness and on-line courses are ever more and more produced across the whole world.

The same situation applies in the case of development tools, which helps the training providers to develop and produce their own courses. Looking at the market of digital media, we find many really very sophisticated development tools like Authorware, Flash, Director, X-help, etc. The main problem of these sophisticated tools is that they offer better and better graphics and facilities for learning and testing, but they are again produced by IT experts, so they do not exactly answer on the training needs. The aim of the training is not only in the well designed screen and colored animations, but in the reasonable student support. The testing is also very possible and the link to the provider and tutor (instructor) is well-managed. What is missing in these application is the learning concept, which is the support of the lonely student in the learning process. The motivation is reduced on the attractive screen and (un)managed contact with the instructor.

3. Distance education message

Distance teaching universities exist in many countries. Distance education was developed from the former correspondence study. The difference between the correspondence and distance study is just in the student support and in other facilities, what help the student to survive in his lonely position. The student needs not only discipline, but also the motivating approach from the teaching institution. The enthusiastic support by the instructor, who is not well trained in the field is disturbing.

The distance education as a technology has developed the sophisticated system of training delivery and also the measures on how to evaluate the quality of the training process and on how to organise it. Unfortunately many new e-learning developers do not have any information and experience with distance education and so the knowledge of how to support and how to manage individual students is not transferred from distance education to e-learning. Before we accept the DE concepts and experience, the e-learning will not cross the testing period (excluding the self-training/testing application for short term courses).

Of course the distance education technology does not fit all new problems emerging from the learning from the computer screen. It is just a new phenomenon. The e-mailing has also developed the new communication culture, changing the relationship between student and instructor (formerly teacher). Generally, from assessments it can be observed, that 90% of e-learning problems are already identified by the distance education provider.

4. University teachers as e-learning developers and instructors?

The real issue of e-learning is in human resources. This article will not deal with the customer (client) part of the process. There are also barriers and resistance to accept it. Let's remain at the production side. If we accept the idea, that graduate and postgraduate studies will also be in the hands of conventional Universities in the future (and will this really be the case? How much time did they have to catch the challenge?), we must consider how the process of e-learning production and management will be shaped.

First we must look at the course production. A good e-learning course is based on these pillars: content, pedagogic aspects, scenario, graphics, IT tool. All these pillars are in fact individual professions. Is it really expected, that university teachers are so multitalented that they are able to do it in the comparable quality level as the commercial providers? How many university teachers have appropriate pedagogical education now? Well, they might not need it in the face-to-face teaching/learning (invisible process), but to produce the study material for an individual student moving in time and space (but the product for learning is well visible!) is a different cup of tea.

The management of virtual class also needs new approaches. First of all we must consider that the main objective of e-learning is not to substitute conventional classroom by the virtual classroom. Perhaps it is important in the countries with big distances between teachers and learners, but generally not in Europe. The main objective is to facilitate the training of big amount of people in the same time period. The training need especially in LLL is growing and will grow in the future as well. How are universities prepared to react to this new situation? The reality is sad. Universities are not prepared. Again, it is possible to learn from distance education, but the resistance and ignorance to apply this experience is stronger than common sence.

5. The learning concept and its meaning

Learning concept is the permanent care about the student leading in the self-learning process and the high level of motivation from the provider towards the student. The management of the self-learning process must be visible in the structure of the learning materials, like tests, aim oriented chapters, competence oriented courses, reasonable and well-managed use of communication between student and provider, good time-schedule (and its appraisal and monitoring) and user-friendly environment in the sense of the stable study conditions during the course.

Many mistakes are done during the communication processes. Many mistakes are done in the leading of the student. Many mistakes are done in the right timing of the study. Many mistakes are done thanks to the low qualification of instructors.

It would take one semester postgraduate course to explain how to avoid these mistakes. There is still at least one positive conclusion from this contribution. A lot of people learn from their own mistakes and share it. Let's hope, that e-learning by e-doing will help us to understand what to do.

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LEARNING FOR LIFE IN THE GLOBAL POOL
DELIVERING EFFECTIVE PROFESSIONAL DEVELOPMENT AT DISTANCE

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Introduction

This paper examines how ICT was central to the development a new Masters level conversion programme for young professionals entering the real estate and construction industry. The course combines experiential and academic study to provide a qualification which equips the student for their professional career, and provides the first step on the life long learning ladder.

Our Virtual Learning Environment (VLE) lies at the heart of the design for this Graduate Development Programme (GDP) and we explain the 'Learning Pools' approach to structuring learning that we have devised. This abandons the notion of simply reading to regurgitate knowledge in exchange for a qualification. Instead the approach adopts the principle of acquiring, developing and building knowledge that is tested and recognized in a work place qualification – a concept which is entirely appropriate for graduate development and life long learners in the construction and real estate professions.

Background

The College of Estate Management (CEM) is a self-funding, not for profit, higher education institution. It is the UK's leading international provider of distance learning courses for the real estate and construction professions. Founded in 1919, the College is one of the oldest UK institutions in respect of both surveyor education and distance learning.

For over twenty years the College has delivered courses that follow the conventions for supported distance education established in the UK by the Open University. Students are provided with comprehensive paper-based study materials specially written by experts, submit tutor marked assignments at regular intervals on which they receive written feedback and sit an examination in a range of modules directed at their professional discipline.

Blackboard was chosen by the College as its virtual learning environment in 1998, and this has been used as a 'bolt-on' facility to existing College courses for the last 8 years. Used in this way as an optional course component the VLE has not been integral to study and students have not participated in the site regularly. Mostly frequently the discussion boards have become a question and answer forum between tutor and student directed at assignment questions.

Support for study from College based tutors is by phone, fax and email. Additionally students in the UK, and a few selected overseas centres, are invited to attend face-to-face meetings where tutors discuss and expand on the content of modules. The College's academic team of internal tutors is small but is supported by a large number of external tutors. These externals are academics or practitioners who mark student's assignments against provided criteria and specimen solutions. To enter the world of virtual delivery our course has made the pedagogic shift away from dissemination of subject centered learning to a developmental one that is student centered.

Activating Study Through Learning Pools

Time is the biggest problem for distance learning students who are daily juggling work, home and study. Although a virtual delivery suggests study freedom the perceived wisdom is that structure is necessary and that, especially when time for the study of individual subject areas is limited, student's attention has to be directed to the primary skills and knowledge areas relevant to their personal situation and professional context. A sequence of study is therefore needed to enable a continuous build up of knowledge and competence as the student progresses through their studies.

Increasingly students are critical purchasers of education especially when making career choices. Changes in modern lifestyles means that they expect study which is novel in design and delivery, and which relies less on passive teaching and more on active learning with interaction enabled by technology. In the professional world it is increasingly apparent that:

- Employees are expected to take greater responsibility for their own actions making their own decisions rather than simply following instructions.
- It is not possible to prescribe in advance all the knowledge that an employee needs for their career. He or she must develop the skills of information search, evaluation and application.
- Employers cannot control their environment but must be responsive to technological and market changes. They require knowledge workers capable of adjusting to flexible environments meaning that a training culture must change to one of learning at work.

Our course is highly concentrated and intellectually demanding, requiring a total of 18 hours per week of which 5 hours are devoted to experiential learning gained in the workplace. In this circumstance the key to active learning is to provide the student with designated periods of time in which they can interact with the study materials, other students and tutors in order to construct and develop their knowledge. This space can be likened to a pool of water in which the student can move freely either swimming or drowning! Figure 1 illustrates the concept and the principal components, which are defined as:

Theme: provides the starting point and focus for the study of a broad collection of related topics with specified learning outcomes.

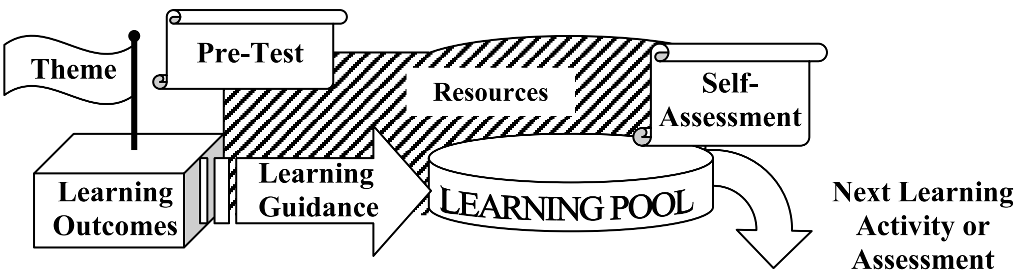

Figure 1. The Learning Pools model for activating learning

Learning Pool: represents loosely structured events where students can 'splash' around completing defined activities designed using differing techniques to meet specific learning outcomes under the guidance of a tutor.

Learning Guidance: provides the tutor's advice or guidance that channels the student towards each learning pool rationalizing learning needs, stimulating ideas, suggesting alternative viewpoints, highlighting problems and suggesting resource usage.

Pre-Tests and Self-Assessment: is the formative feedback to the student on their progress as they enter and leave the pool. The pre-tests are self-diagnostic questions that help the student to understand what they already know and what they need to know. The self-assessment questions help the student to recognize what they have learned from the activity and what they next need to know.

Resources: wrap around the whole module. They may be reference papers adapted from conventional study papers, articles, research papers, web resources, audio or videotapes, textbooks, DVD or CD-ROMs. They are not studied prior to entering the learning pool but are accessed as a direct response to learning needs that become apparent to the student in order to complete the activities within the learning pool.

The outcome of each learning pool is the progression to either the next learning activity (pool) or to the summative assessment. It is central to the approach that there is a logical progression between pools and that the outcomes of the learning activities are related to the summative assessment. This keeps the student on track as they see the activities as having direct relevance to their development and to their ultimate mark.

The simple rationale is that if the student wants the qualification they must complete the assessment. To complete the assessment they must participate in the activities and to complete the activities they must use and understand the resources. They are supported in achieving this by the online tutors who keep them on track.

Making Learning Pools Work

To implement the learning pools pedagogy we developed the course around the VLE so that it became integral to student study. Learning activities are only accessible online and are designed to encourage individual and collaborative learning. As all students are in work these activities are designed to present the student with a sequence of problems that require them to research both their workplace and the supplied study materials. Case studies are used to present common situations that students need to be able to analyse and solve as part of their professional practice. We have used authors expert in their field to prepare the activities so that they are not simply theoretical perspectives but reflect and explore real life situations.

For many of the activities students are required to bring their findings to the discussion forums dedicated to specific activities where they can review their discoveries with those from other students. To encourage group discussions to occur students were divided into tutor groups of 25-30 which we have found provides the necessary critical mass. Key to participation occurring is having in place trained online moderators to act as facilitors to the debate. Our online moderators are professionals who bring to their group life long experience of the property and construction industry, and can both stimulate group discussion and support individual student's development.

We have introduced self-assessment as an interactive CD, developed in QuestionMark, which students use to test their own learning progress. Quizzes are set up to select a random selection of questions from a databank allowing the student to visit and re-visit key concepts before, during and after topic areas are covered.

Meeting Learning Needs

We have paid particular attention to the learning needs of our students. Adult learners have distinct learning characteristics, which they bring both to the workplace and to their academic study. Building on the learning styles identified by Honey and Mumford (1986) the design of the GDP has sought to meet these in various ways. The activist needs to learn through dealing with new problems, and the pragmatist wants to see links between their study and problems or opportunities with which they are engaged in their work. We deliver these needs through those learning activities which relate back to the working environment. In this it is important that the student is able to engage with their sector of work and, particularly for overseas students, their locality. This provides the student with plenty of opportunity to help them understand how key concepts work in practice, whilst the academic theory develops the students' knowledge base. This feeds back into the learners working life to equip them with the skills they need to maximise their career potential.

Reflectors prefer to think deeply about the concepts and activities before making a considered response. For these learners the asynchronicity of the discussion forums allows their contributions to be reasoned and measured. Rushing such learners is pointless and worthwhile online discussion requires that an appropriate period of time is designated for discussion. In this respect reflectors are similar to the theorists who like to explore the links between ideas and situations before committing. We consider it essential that comprehensive supporting materials is available that provides a core of knowledge which these learners can use. This may be either paper-based or web based but the important thing is that a student should not believe that reading alone provides their course of study. To develop their understanding of both theory and practice students must be encouraged to become critical users of the range of knowledge sources which the learning pools model seeks to achieve by focusing on the problems first and not on the subject specifics.

Active Learning

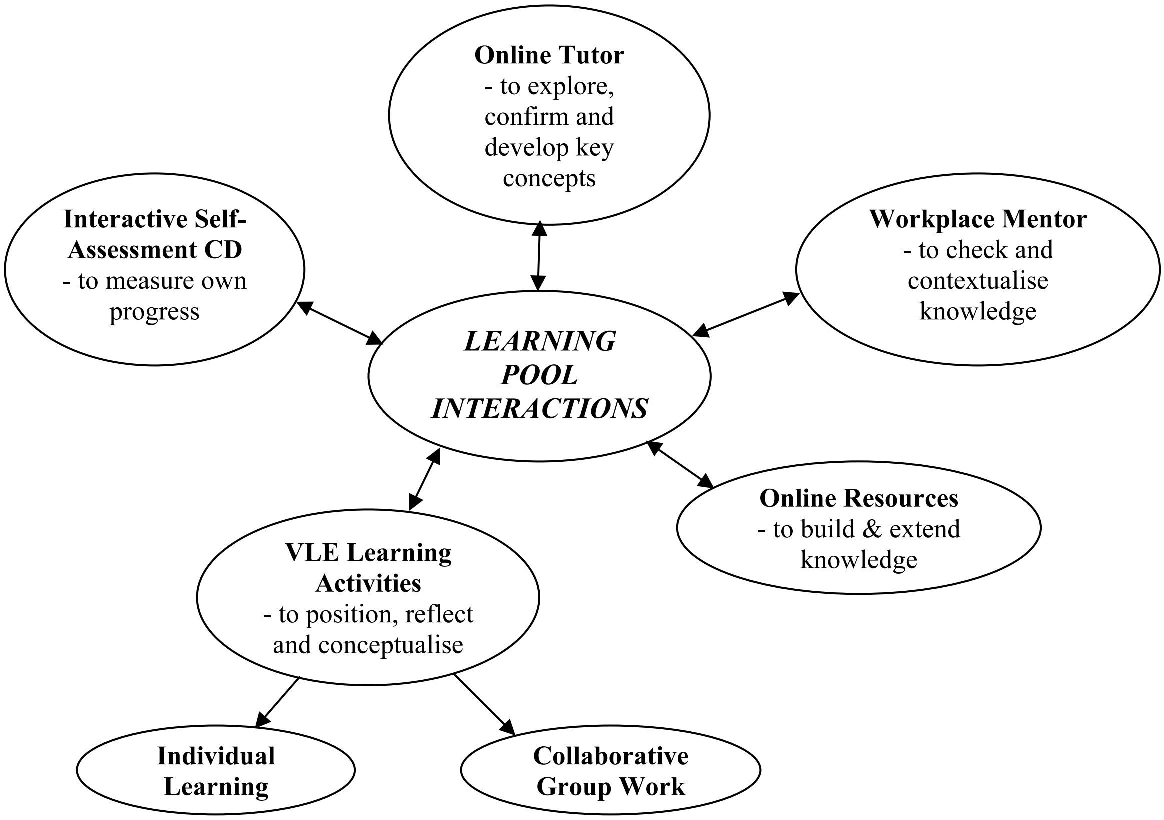

Figure 2. Learning Pool Interactions

Figure 2 highlights the interactions the student participates in during the course.

The students' success depends on how actively they choose to engage with the activities and the online tutors are highly instrumental in facilitating this. Students are also encouraged to find themselves a workplace mentor to support them in their study, and again this provides a mechanism for the academic study to feed into, and draw upon, the experiential learning.

The great value of the approach comes from the ability to engage the student in collaborative asynchronous group learning. This not only removes the isolation that naturally occurs with distance learning but enables sharing of experience to occur. Older students can share their work knowledge with the younger more inexperienced members of the group. Younger students can pass on their more recent academic abilities to their older colleagues whose academic skills may be more rusty.

Conclusion

The factors described are, within our experience, critical to enabling the student to become an active learner, and remove the passivity from distance learning study. Aspiring professionals in today's workplace seek courses that match their own and their employer's expectations and which are flexible, relevant, engaging, value for money and fit into busy patterns of work and domestic life. In this respect the use of ICT provides the student with a depth and richness to their learning experience that stimulates and engages them. By harnessing the three dimensions of expert knowledge source, workplace experience and dialogue between students and tutors, we believe that the learning pools model not only benefits the student personally in their development but also their employer and the wider profession.

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EFFICIENCY MEASURES OF DIFFERENTIATED ON-LINE LEARNING ENVIRONMENTS
THE CONCLUSIONS OF A RESEARCH

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Abstract

Nowadays, when we experience the growing presence of electronic course materials, the aspect of quality, quality assurance and the aspect of efficiency have become more and more important. The research presented in this paper is based on an efficiency measure of an electronic course package (developed by the authors), which indirectly identifies the preliminary knowledge of the e-student, and maps directly his/her motivation background and learning strategy, as individual factors effecting the efficiency of the learning process. The learning environment (developed during the research) – by the means of the quantitative and logical arrangement of the learning content, and by the evaluating feedback – organises the e-content according complex learning algorithms during the whole learning process.

Introduction: Education in information society

Considering the fact that electronic (web-based, on-line, multimedia) applications and learning environments have already become quite widespread, we do not have to argue for the necessity of integrating these tools into the learning process, but we have to argue for putting the factors of quality, quality assurance and efficiency into the forefront (especially in the context of development of new tools and applications). In the case of the developments of electronic, on-line and eLearning learning environments, technology and pedagogy has to go hand in hand.

Information technology based learning environments

The possibility of personalisation of teaching is one of the most outstanding possibilities offered by the info-communication technologies for the world of education. Technology creates the possibility for developments designed for the individual, which result in digital (multimedia) course materials structured in accordance with the needs and learning habits of the individual. The research to be presented in this paper aims to reach the above mentioned goals (as well.)

Digitised course books: non-regulated model

The first generation of multimedia and on-line course materials has been presented for the users in the form of an "electronic book". The new teaching-aids (in this category) were the digitalised, electronic versions of the traditional course books (including sometimes motion pictures and audio materials also). Even though these solutions often present spectacular possibilities, these type of learning environments offer only slightly more, than the traditional printed course books. These models represent either linear arrangement of the content, or they do not prescribe the order of the sub-part supposing a high level of self-regulating learning ability of the user.

The model of the "programmed" algorithms

The next level of the teaching aids and course materials can be found in the theory and products of the programmed teaching, as a trend of applied didactic. The content arrangement and management methods, based on Skinner's learning theory of operative conditioning, or on affirmation and differentiated feedback, became the bricks of such learning environments built according to the individual learning needs, where the limits of their further evolution were the limits of the technical sciences of the time. (Skinner 1968). Programs, characterised by multiple choice, close-ending questions, providing differentiated content and evaluation feedback for typical answers, could be perfectly suitable for supplementing the multimedia learning environments.

The model of the interactive algorithms – The outline of a possible solution

The third generation of course materials use the possibilities offered by the on-line environment function not only as an information source, but also as an observer focusing on the individual specificity and activity of the user, and which consequently provide lot of source data for actively forming the learning environment, and for the continuous forming of the content and of the learning-organisation.

While the learner is answering questions and uses the e-tool for learning, the electronic learning environment gathers data about several aspects of the learner's activity. Based on the integrated calculation algorithms, saving and using the gathered data, the learning environment continuously forms and adjusts the contents, the style and all the elements that can be regulated of the learning environment in accordance with the individual learning specificity of the learner.

Program development in this case is strongly connected to content development. The creation and formation of a virtual learning environment strongly compound, made of atomic parts, built to consider the diagnosed learner specificity and their possible values is a much bigger and more difficult development task compared even to the common simple multimedia applications or to programmed algorithms.

Course material of the research – The research program and its results

The goals of the research

Concentrating on the characteristics of the above described three different types of learning environment, we have developed – as a result of our own research and development – a test learning environment, where the same content, with similar design was presented differently in accordance with the three didactic evolution level. The theme of the test learning environment was a literary topic which is organically part of the national secondary school curricula in literature in Hungary.

The technical and the programming background of the course material of the research

The three learning environments of the research were based on the same teaching content, structured differently in accordance with the three different didactic principles. All three learning environments were made of three main parts ending with the same examination questionnaire with 13 multiple-choice and one open ended questions. The developed system started (in all three learning environments) with two sets of diagnostic questions, to which answering was obligatory for the e-learners. The questions aimed to diagnose on the one hand the learners' motivation regarding literature, and on the other hand their learning specificity.

In the first environment, student could progress in the order as they wished, freely choosing among the content items. In the second environment, the parts – in a set order they were based on one another, and set algorithms organised the learning path within the certain content items also. In the third learning environment, the learning path was determined also, however in this case the learner's own learning habits and specificity were also taken into account is each case.

The first learning environment did not require any bigger development activity; students could orientate themselves in the course material by a usual menu map. In the second environment the base for the differentiated feedback was the preliminary knowledge of the students (indirectly measured by questions and answers connected to the certain thematic items). In the third type of learning environment, the content parts were supplemented by further items in accordance with the motivation and learning specificity of the given learner. In this learning environment, pictorial, visual aids were given for example for those students being dominantly visual in their learning specificity. Student characterised by detailed, or reproductive learning specificity, were given sub-summaries, and supplement content most suitable to their learning habits by the automatic algorithms of the on-line environment. The on-line environment recorded the full activity process of every student.

The comparative examination of progress

236 students have registered to the learning environment during the first phase of our research. The users were students of secondary schools in the countryside of Hungary. Students could access the on-line learning environment both from school and from home. Students were randomly grouped into one of the three environments (the sizes of the three groups were approximately similar). According to the results of the questionnaire at the end of the course material, students had the following mean results:

Table 1: The mean results of the students in the different learning environments

The types of the learning environments	Mean results (max., 13 points)
Digitised course books: non-regulated model	7,44
The model of the "programmed" algorithms	10,85
The model of the interactive algorithms. The outline of a possible solution.	9,77

Among the mean averages of the student performances in the different learning environments there is a significant difference ($p<0,000$). The difference between the non-regulated and the programmed models can be most significantly seen between the free learning environment and the utilisation of the differentiated feedbacks based on preliminary knowledge. The two learning environments have caused significantly different mean averages of student performance (3,36 point difference, $p=0,001$).

There is a considerable difference between the non-regulated model and the model of the interactive algorithms (2,32 point difference, $p=0,012$), where the cause of the difference may lie in the 1 different main characteristics of the two learning environments. This result shows, that compared to the traditional "digitised" course books, that content management built on algorithms, definitely causes a higher level of student performance – regardless of the level of interaction and the quality of the individualisation of the learning environment.

The possible reasons of the performance differences

The activity of students as users

The 236 students participating in the research were randomly grouped by the on-line learning environment, consequently approximately the same proportion of student had the possibility to learn in the certain environments. (Group A=33,9%; Group B=31,1%; Group C=33,0%). The performance distributions of the different groups show that student using the more common, non regulated environment have reached the end of the e-course in a larger proportion, compared to the other groups. (Group A=59,4%; Group B=20,3%; Group C=20,3%).

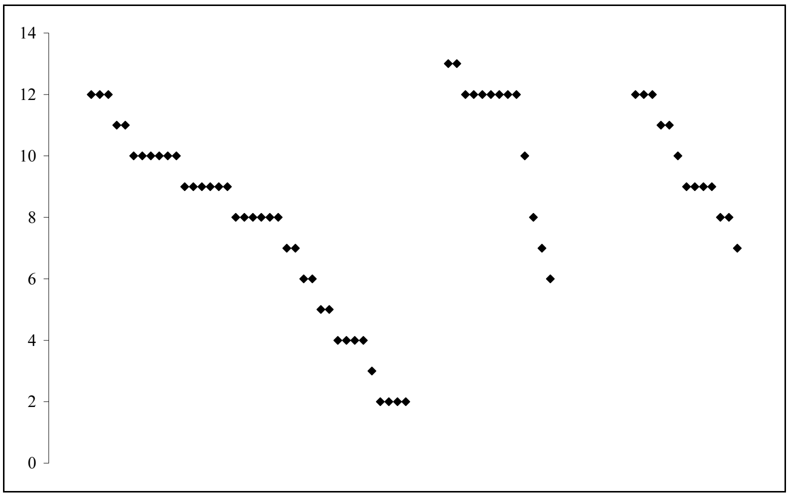

Figure 1. Student performance distribution in the three learning environments (Group A, B, C)

This above result was greatly affected by the fact that student have ‘met’ the learning environment as past of their classroom activity in school, which gave a closed time frame for them regardless of which learning environment they used.

Due to the fact that students were given the same circumstances during the research, the causes of the differences can only be rooted in the specificities of the learning environments and in the different learning habits and the specificities of the students. For this reason it is reasonable to examine why students were using the e-course material, and why they finished in certain cases before the end. This examination field is the field of the student motivation regarding learning.

The effect of motivation on student performance

Before starting to use the course material (in all three learning environment) each student have filled out a simple e-questionnaire, which was examining their learning motivation. Regarding the agreement with certain statements, it could be determined, that on a scale of one to five, where a student could be placed regarding inner and outer motivation factors. The motivation tool is a tool developed by the authors, which tool was measuring not only students’ general motivation, but their motivation regarding studying literature also.

A motivated student not only spends more time with the learning environment, but – according to the rate of his/her motivation, s/he does it more effectively, and consequently reaches a better result. (In the present research, the participating schools did not use any outer motivation factors (no extra points, grades) for participating students).

According to our hypothesis:

1. The non-regulated environment is more suitable for those students, who have higher motivation level, and who have spent a lot of time with the learning environment (regardless of the inner or outer sources of their motivation). Consequently these students shall be capable of a better performance, thus the learning motivation and the good performance should show a strong correlation in the non-regulated learning environment.

2. The model of the “programmed” algorithms and the model of the interactive algorithms are more favourable for students with lower motivation level, because the decisions regarding the learning path do not depend on the student’s own decision, but on the specificity of their answers. The more regulated environments are more favourable for students with lower motivation level, while the regular queries as means of learning management may in several cases be disturbing for students with higher motivation level, which can even damage their motivation regarding the given learning environment, and consequently may result in lower performance. (Consequently the end result points expressing efficiency and the learning motivation are supposed to be in opposite correlation with each other in the programmed and interactive learning environment.)

In the course of the research based on the observed student specificities and the observed results, between the end result points (student performance) and student motivation the relations were the followings:

Table 2: The relation between student performance and motivation factors in accordance with the learning environments (r=correlation; p=significance level)

The type of the learning environment		The measure of inner motivation	The measure of outer motivation	The mean measure of motivation
Digitised course books: non-regulated model	**Performance**	r=0,068 p=0,684	r=0,201 p=0,226	r=0,127 p=0,449
The model of the "programmed" algorithms	**Performance**	r=-0,111 p=0,718	r=-0,173 p=0,573	r=-0,140 p=0,649
The model of the interactive algorithms	**Performance**	r=-0,155 p=0,614	r=-0,092 p=0,765	r=-0,098 p=0,750

Student performance in the non regulated model was in positive relationship, while the student performance in the interactive model was in negative relationship with the inner, and outer motivation, thus with the general motivation also. According to the above table, one can see that the hypothesis of the authors have pointed toward the right direction, however the significance level has not reached the critical level ($p<0,05$) at no place.

The visual supplement of the interactive model

For students characterised by the dominance of the visual learning specificity, the on-line environment showed pictorial explanation, figures and illustration beside the text, helping and promoting to a more effective learning. The illustrations remained hidden for those, who were not characterised by the visual learning habits, because their appearance would not help the study of these students.

Table 3: The relation between student performance and visual learning specificity in accordance with the learning environments (r=correlation; p=significance level)

The type of the learning environment		The measure of the dominance of the visual learning specificity
Digitised course books: non-regulated model	**Performance**	r=0,286 p=0,081
The model of the "programmed" algorithms	**Performance**	r=0,574 p=0,051
The model of the interactive algorithms.	**Performance**	r=0,267 p=0,378

According to the data, student performance quite surprisingly does not show positive significant relationship with the visual learning habit at any of the models. The structuredness characteristic of all three environments had a small, but generally positive effect on student performance, while in the case of the interactive environment one could detect the highest insecurity (p=0,378), and on the other hand also the smallest positive effect (p=0,267). According to the before mentioned, the illustrations appearing in the interactive model due to visual learning habits does not have significant effect on student performance.

In the table bellow we call student with visual learning habit every user, who reached an average of 4,00 on the scale of 5 when answering those questions relevant for measuring the visual learning habits.

Table 4: Student performances at visual and non-visual dominant students, in accordance with the learning environments (p=significance level)

The type of the learning environment	**Student efficiency – the mean of the performances**		**The scale and possibility of difference**
	Average or non-visual dominant students	**Students with visual learning dominance**	
Digitised course books: non-regulated model	7,45	7,42	p=0,986
The model of the "programmed" algorithms	10,85	10,83	p=0,986
The model of the interactive algorithms.	9,70	10,00	p=0,801

Conclusion

The results of the research show unambiguously, that the on-line learning environments built and based on different didactic models, are different not only in their use and in their visual outlay, but according to the student performance measures they can be different in efficiency also. According to the presented research, efficiency is unambiguously dependent on the mode of the learning management. Furthermore one can suppose that the interactive adjustment to learner's motivation and learning specificities may also significantly affect the efficiency of the learning activity of the students.

In the development processes of on-line learning environments, it is not debated any more, that the learning environment shall be adjusted to the individual needs and specificities, but in a more emphatic way the question is about which learning specificity should be taken into account more emphatically when designing the algorithms of the interactive learning environments, and what content and technical solutions are the most suitable for certain learning specificities.

The results of the research indicate, that it is worthwhile to envision a course material which detects and measures the learning specificity of the learner, which observes the student activity in the learning environment, and the learning process is 'regulated', formed accordingly in order to reach the highest possible level of efficiency.

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TEACHER EDUCATION: THEORY INTO PRACTICE WITH E-LEARNING

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1. Introduction

To help students to cope with an increasing complexity and ambiguity both in private and at work, education and formation processes aim at the support of ‘self-regulation’, ‘self-organization’ as well as ‘self-responsibility’. ‘Self-organized learning’ is an example for a tried and tested didactical model, which improves the complex problem solving ability of students (Sembill, Wolf, Schumacher & Wuttke 2002). Even though this model has proven its superiority compared to traditional teaching, the conception does not gain ground easily in schools. The dissemination is hindered by several issues such as high efforts for planning and preparing self-organized learning classes and the inexperience of graduates and young teachers in these new methods (Pätzold, Klusmeyer, Wingels & Lang 2003) as well as the uncommon style of teacher cooperation in preparing classes (Altrichter & Eder 2004).

To counter these problems, a virtual seminar has been developed to:

- give students practice in creating complex learning environments and learning material;
- introduce them to the *use of internet based learning environments* supporting the creation and exchange of materials;
- train them to use *internet based communication tools* to give feedbacks to each other as well as do peer assessment;
- use *e-portfolios* to document their learning processes and try their hands at process self-assessment;
- start building a *community of practice* for teacher education and further education, connecting different phases of teacher education as well as practitioners in schools.

The overall goal of the virtual seminar is to introduce the students into life long learning processes necessary for their future career as teachers and connect them with peers and practitioners.

2. Conception of the online seminar

Virtual seminars demand a specific use of methods, appealing and comprehensable contents, a detailed tutoring concept as well as an easy to use technical infrastructure for implementing demanding didactical conceptions. All this will be described in the following section.

2.1 Contents

The basic idea of the seminar is to let the students experience and reflect the planing and preparation of ‘classroom teaching open to self-organization’ (Self-Organized Learning). Also of importance is the ability to assess such learning processes. As regards content the seminar is situated in the field of business education, in which the topic “business accountancy” needs the most attention (Seifried 2004).

The seminar has been broken up into four tasks (problem formulation = PF) to be solved by the students: PF 1: *Reinvent teaching* – modern teaching-learning environments; PF 2: *Innovation in business education* – critque of traditional business accountancy teaching & case studies ‘teaching open to self-organization’; PF 3: *Prepare classes* – develop problem formulations and materials; PF 4: *Assess learning processes* – alternative assessment methods.

2.2 Didactical methods

The key focus of the student's activities is the collaborative solving of complex, ill-defined problems. The users set goals, create content and assess each other's solutions. The seminar asks for and fosters the '5 C' of constructivist learning in communities (Wolf 1995): Creation, Construction, Communication, Cooperation and Collaboration (which includes Coordination).

Because of the lack of face-to-face communication in a virtual learning setting, the course enforces a more strict guidance, implemented in a six-step course (1: Getting Information; 2: Solve Problem; 3: Check own solution; 4: Publish own solution and analyse other's solutions; 5: Analyse feedback of tutors; 6: Reflect and Connect), combining the principle of complete action (Koch & Selka 1991, p. 18) with Roger Schank's (Cognitive Arts) schema developed for virtual seminars of Columbia University (Wolf, Städtler & Baumann 2002).

To strengthen the continuity of the processes learned, aspects of *Communities of Practice* (Wenger 1998) were incorporated into the seminar[1]:

- *domain of knowledge:* theory of, planing and designing powerful learning environments based on 'Self-organized learning';
- *community:* students, assistant teachers, teachers, lecturers and researchers focusing on the domain;
- *practice:* to increase effectiveness and efficiency in implementing classroom teaching in the field of business education.

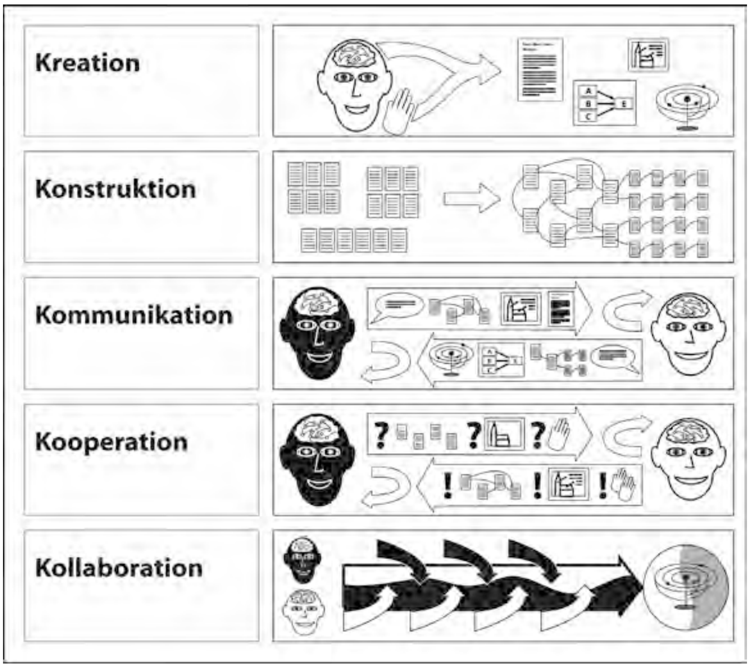

Figure 1. Key tasks of constructuvistic learning in communities (5 Cs)

2.3 Learning environment

Based on the experiences of implementing blended internet-based learning (Wolf 2003) the following requirements for the online environment were defined:

- the online-phases are to be supplemented by face-to-face meetings ('blended learning');
- the usability has to be ensured by consecutive testing;
- the internet usage does not aim primarily at the virtualisation. It rather serves to support communication, cooperation and collaboration.

[1] For a detailed discussion of the integration of the community of pracitce appraoch into formal learning settings see Rausch 2004.

To realize these requirements, the course has been implemented in the learning environment Ever-Learn (http://www.everlearn.info)[2]. This system supports authors to create multimedia learning contents, supplies communication services such as instant messaging or group chats, supports cooperation with discussion boards and content attached feedback channels and provides a platform for collaboration (shared pages a.k.a. Wiki pages). For example, the students created their own shared pages to document their learning processes as a ePortfolio (see Figure 2).

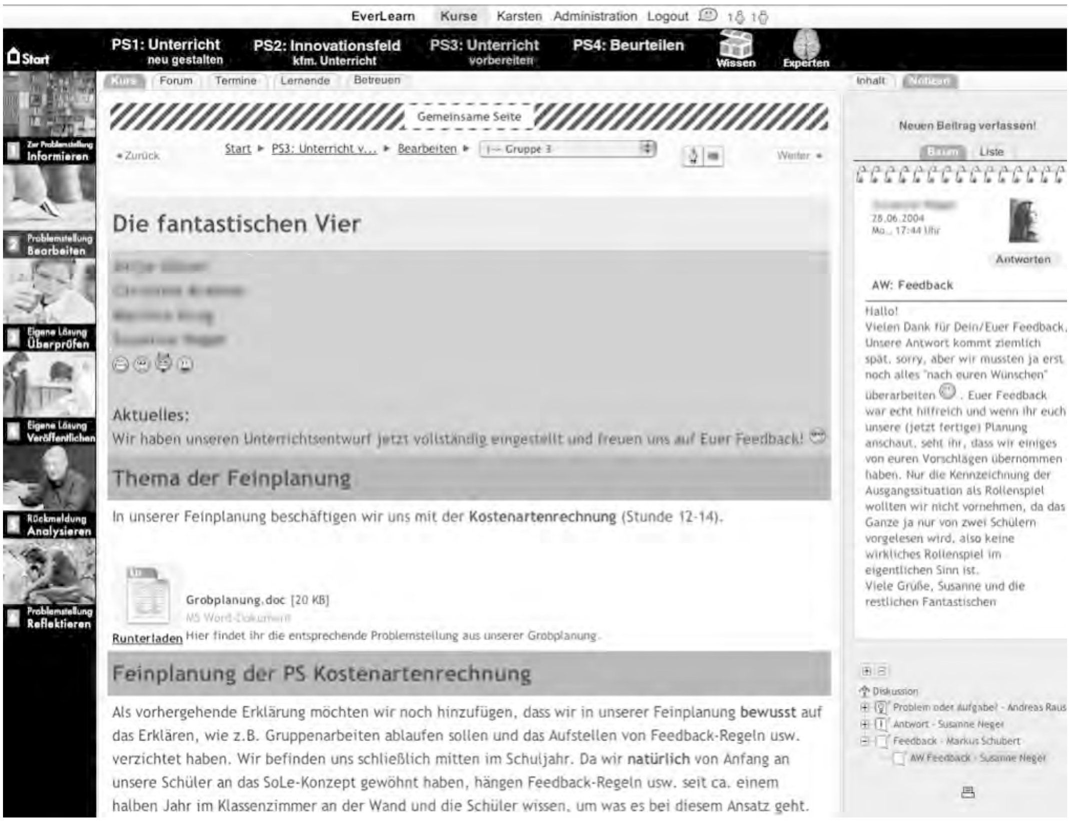

Figure 2. Shared page with work results and tutor/peer feedbacks

2.4 Tutor activities

The most important aspects of successful online courses is to make sure that the learners get prompt and personal feedbacks for their work (Brugia 2004). To ensure this a tutor guidebook described the tasks of the tutors in each phase of the seminar, for example to give feedbacks, to sum up discussions, help students to assess their own and other student's efforts or to conduct live chat sessions with experts (for further details see Egloffstein 2004).

2.5 Assessment

The collaborative solving of complex problems is the center of Self-organized Learning. This poses a problem for traditional assessment techniques because of the process character of learning. The seminar uses an *alternative assessment* strategy:

- the overall score is made up of scores for the four parts of the seminar;
- group grades are the same for each member of the group;
- PF 2 and PF 3 do have more weight for the overall score than the over problem tasks;
- feedback given by the tutors while working on a task do not degrade scores;
- high quality peer-to-peer feedbacks are honoured by bonus points;
- self-, peer- and tutor-assessments are mixed into the final score.

[2] You can find a demoversion of the online course at http://everlearn.bamberg.uni-erlangen.de/demo/sole/.

The seminar therefore realizes a *process assessment* based on the documentation of learning and work processes, complemented by self- and peer assessment.

3. First empirical findings

Following is data from a pilot run of the seminar (SoLe vhb) in summer term 2004. 43 students of business education at the University of Bamberg, Germany, participated in the study (20 men, 23 women). Pre- and post-surveys were conducted to measure previous knowledge, skills, motivational effects and learning outcomes.

IT-skills are rather low for students in educational studies. 90% did not have a homepage on the internet, 75% had never used a HTML-editor to create a webpage. After a 30 minutes introduction at the kick-off meeting all users had their own homepage in EverLearn and had no problems to maintain their group's ePortfolios. The IT-pre-knowledge had no effect on the success and the participation in the seminar. The speed of internet access (Modem/ISDN vs. DSL) correlated highly with the enjoyment of using the online learning environment Over the course of the seminar (81 days) students logged in every 2.15 days on the average, which can be interpreted as regular and active participation.

Table 1: Motivation scales by Prenzel (Means, scale values 1-6, best values bold, worst values italic. Because of the different samples in the benchmark studies, no t-test/Wilcoxon test has been calculated to compare statistically significant differences between means.)[3]

				SoLe III		TraLe	
Item	**SoLe vhb**	**EduSerf**	**SoLe II**	**EG1**	**EG2**	**II**	**III**
Amotivation	**1,82**	2,17	2,31	**2,00**	2,19	*2,47*	*2,53*
Extrinsic motivation	**2,21**	**1,93**	2,45	2,22	2,52	*2,58*	*2,55*
Introjected motivation	**4,86**	*3,90*	4,07	**4,33**	4,27	4,20	*4,14*
Identified motivation	**4,75**	4,73	4,68	**4,80**	4,53	*4,02*	*4,51*
Intrinsic motivation	**4,48**	**4,73**	4,27	4,18	4,00	*3,04*	*3,20*
Interest	**4,11**	**4,80**	3,76	3,92	3,51	*3,24*	*3,04*
conditions							
Negative perception	3,02	**2,00**	2,74	**2,55**	2,87	*3,09*	*3,11*
Positive perception	**4,24**	**4,77**	3,77	3,87	3,40	2,73	*2,87*
Perceived importance	*4,23*	4,50	4,43	**4,79**	4,54	*3,93*	**4,59**
Social relatedness	**4,79**	4,25	4,27	**4,85**	4,17	*3,98*	*3,52*
Support of competence	**4,47**	**4,10**	4,04	4,17	3,82	*3,35*	*3,36*
Autonomy	**4,72**	**4,99**	4,28	4,24	3,81	*3,44*	3,28
Quality of instruction	**4,55**	*3,65*	**4,49**	4,58	4,53	3,94	*3,88*
Fit of requirements	3,14	2,27	3,53	3,07	3,27	3,13	3,02

Being a departure from traditional seminars, posing a heavy workload on the students and putting them into a new semi-virtual setting, the first question was, if the online seminar could match the level of motivation found in selected benchmark studies (measured with motivation questionaire by Prenzel, Kristen, Dengler, Ettle & Beer 1996). As shown in Table 1, the values for motivation are in line with other Self-organized learning classes (SoLe) and consistently higher than for traditional learning

[3] SoLe II: n=15; business clerks, human resourcemanagement, see Sembill / Wolf / Wuttke / Schumacher 2001. SoLe III: n=44, office clerks, business accountancy, see Seifried 2004. SoLe-EduSerf: n=11; education majors, semi-virtual seminar, see Wolf 2003).

classes (TraLe). In comparison with another internet based seminar (Wolf 2003) there are some interesting differences. Both the values for social integration and quality of instruction are higher for the new study. Two factors seem to be important for the higher instruction quality: a more intensive tutoring and a stronger processing structure of the problem cases. The self-organized learning setting seems to be especially fitting for an online seminar!

In regard to the level of self-organization (see Table 2), the *practical relevance* ("Things I learned in the seminar will be useful at work, too") is on a very high level. The intended *complexity of the problem* is to be found in the low score of the item "There was only one correct solution for the problem". A successful implementation of Frese's concept of *error management* (1995) in training shown in the high score for the Item "Errors as a chance for learning".

Table 2: Comparison of selected items for level of self-organization (Means, scale values 1-6, best values bold, worst values italic. Because of the different samples in the benchmark studies, no t-test/Wilcoxon test has been calculated to compare statistically significant differences between means.)

				SoLe III		**TraLe**	
Item	**SoLe vhb**	**EduSerf**	**SoLe II**	**EG1**	**EG2**	**II**	**III**
Things I learned in the seminar will be useful at work, too.	**4,88**	**4,67**	3,87	3,81	3,36	*3,73*	3,85
There was only one correct solution for the problem.	**1,88**	**1,67**	3,20	*3,31*	3,27	3,13	*4,35*
In the seminar, errors were viewed as a chance to learn something.	**4,98**	4,78	*4,47*	4,81	4,86	*4,00*	**4,90**

Further analysis of the seminar will focus on the community building process, the community perception and the learning success, especially the complex problem solving competence (learning outcomes).

4. Conclusion and further steps

The above described online seminar is an example for e-learning *preparing* students to engage in learning communities and life long learning. The students were introduced to work and learn in a self-organized way, solve authentic, ill-defined problems and use modern internet based CSCW-tools. The seminar is offered on a regular basis each semester at the *virtual university of bavaria* (vhb). One future goal of this online course is to create a platform for exchange between students, alumni in the second phase of teacher education, and practitioners in the schools.

The most important and difficult task has been to lower the technical barrier for all learners to create content by themselves. As shown in the motivational perception of the seminar, engagement by actively constructing materials and giving feedbacks to peers is of uttermost importance. None of the students were technically left behind, even though they had to participate in chats, discussions and editing of shared pages with minimal training and computer knowledge. Extensive usability testing and extreme simplification of web application's interfaces is necessary to reach an even wider audience in vocational training and professional development. Another aspect important for the acceptance of online learning environments is the speed of internet access.

To create successful e-learning in the context of life long learning, the self-organized learning concept (Sembill / Wolf / Wuttke / Schumacher 2002) seems to be advantageous. In the next step the seminar will be *made accessible for practitioners* at schools and *kept open* for the former participants to support the building of a community of practice spanning different phases of teacher education and continuing education.

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ASYNCHRONOUS LEARNING NETWORKS, THE BENEFITS AND THE CHALLENGES FOR PEOPLE WITH DISABILITIES

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1. Introduction

Distance education is not a new concept. Holmberg (1995) suggests that distance education as a method of study has been practised widely in countries across the globe for many years. This historically rooted educational practice has however evolved into newer, and more flexible, forms, emerging partly in response to broader social, economic and political changes, but also facilitated by advances in communications technologies. The result – diversification of distance education and the development of innovative approaches to learning. As Ireland's largest non-Government training organisation the National Training and Development Institute (with more than 50 purpose built training and employment units nationwide catering for over 4,500 students each year) has been instrumental in pioneering distance learning courses for people with disabilities. However, changing educational practices together with advances in technology pose new challenges. In regard to these changes we must ask do all potential learners have equal access to 'learner centred pedagogies'? For example, what are the advantages for people with disabilities? What barriers do they face? This paper discusses these issues in greater detail, looking firstly at the potential for social inclusion that 'virtual community' offers, then at some of the potential barriers to access.

2. Virtual Communities

2.1 The Learner – from Solitary Receptacle to Collaborative Explorer

Practices of teaching and learning are changing. Learners are no longer considered as solitary empty receptacles into which knowledge is poured, teachers are no longer considered as the sole disseminators of that knowledge (see Thorpe, 2002, p. 139/140). Instead there is increasing focus on, and acknowledgement of, the social dimension of learning (see Wegerif, 1998). The development of knowledge in collaboration, as opposed to individual cognitive development, is seen as being a more accurate reflection of how new knowledge is constructed – arising out of collaboration between people as they come together to achieve a common learning goal (Wenger 1998, Lave & Wenger, 2002). Lave and Wenger's (1991) concept of 'Communities of Practice' is often used to enhance our understanding of this social dimension of learning.

2.2 Communities of Practice

A community is created where people who share something in common, such as interests, goals, experiences or values, come together to form a social grouping. This may include social activities, such as playgroups, clubs, sports organizations, or any group that is involved in pursuing similar goals (Thorpe, 2002, p.131). As suggested by Wenger:

> Communities of practice are everywhere. We all belong to a number of them – at work, at school, at home, in our hobbies. Some have a name, some don't. We are core members of some and we belong to others more peripherally. You may be a member of a band, or you may just come to rehearsals to hang around with the group. You may lead a group of consultants who specialize in telecommunication strategies, or you may just stay in touch to keep informed about developments in the field. Or you may have just joined a community and are still trying to find your place in it. Whatever form our participation takes, most of us are familiar with the experience of belonging to a community of practice.
>
> (Wenger, 1998)

The concept of Communities of Practice can also be very useful in helping us to understand how newcomers are gradually integrated into the 'socio cultural practices' of a community.

2.3 Legitimate Peripheral Participation

Lave and Wenger (2002) use the concept of "legitimate peripheral participation" to describe the process whereby newcomers to a learning community become familiar with the "socio cultural practices" of that community. The gradual gaining of knowledge and skills allows for the gradual enhancement of participation within the community, up to the point where the individual moves to full participation. In other words learners need to become familiar with the discourses of a particular community before they reach a point of full participation. Lave and Wenger suggest that "a person's intentions to learn are engaged and the meaning of learning is configured through the process of becoming a full participant in a socio cultural practice" (Lave & Wenger, 2002, p.56).

3. Enhancing Opportunity through Asychronous Learning Networks (ALN's)

3.1 What Can ALN's Offer People with Disabilities?

The concept of Communities of Practice acknowledges therefore the importance of the social dimension in learning. Wegerif (1998) argues that the social dimension is particularly relevant to enhancing the effectiveness of Asynchronous Learning Networks (ALNs). A study of an ALN carried out by him found that, "individual success or failure on the course depended upon the extent to which individual students were able to cross a threshold from feeling like outsiders to feeling like insiders" (Wegerif, 1998, p.2).

Applying the same argument then to people with disability we could say that, in relation to mainstream society, they have in the past been (and in certain instances continue to be) somewhat like the outsiders in many cases. Take for example, the wheelchair user who finds joining in social gatherings challenging, because of inaccessible facilities and conveniences. Take the person who is blind, and will doubtless find navigation of certain facilities very difficult, for example a building with many steps. Take the person with Multiple Sclerosis, where pain and fatigue often limit enjoyment of the daily activities that able-bodied people take so for granted. And what about someone with a hearing impairment, who finds participation within a group setting very challenging and frustrating, many voices and just too much background noise. Unable to 'cross the threshold' they continue to have no chance of 'feeling like insiders'.

For people with disability then the potential to play an active part in a community, i.e. through participation in 'virtual' space as opposed to participation in 'physical' space, together with the opportunity to access education virtually, should lead to greater enhancement of the lives of people with a broad range of disabilities. In fact it would appear that 'virtual' participation would particularly suit the needs of such people. Indeed much has been achieved in relation to accessing virtual learning environments for people with disabilities.

3.2 Assistive Technology

In terms of physical access to computer technology, assistive technology can solve the problems of access to computer hardware and applications. Simpson (2002) outlines some of the technical aids that may be used to assist learners with disabilities in terms of computer access. For example, someone with a visual impairment can have access to Braille materials, magnifiers and text-voice converters. Hearing impairment can be addressed by the use of transcripts and/or lip-speakers. The use of specially adapted equipment such as special keyboards can assist those with mobility impairment. In addition to physical and sensory disabilities people may also have mental health issues, or a learning disability. Simpson suggests that people with mental health issues or learning difficulties such as dyslexia find distance education a particularly attractive option. The reasons for this are probably to do with previous unsatisfactory educational experiences and lack of qualifications. And for learners with mental health issues "learning can be therapeutic and offer validation that is hard to find in the rest of their lives" (Simpson 2002). It would be difficult to include all types of disability here. The point to remember is that while education progresses towards embracing the use of ICTs and the Internet as an integral part of learning, that assistive technology can become an enabling force in facilitating fuller participation by people with a broad range of disabilities. Assistive technology may be only part of the picture however. It is also important to consider the challenges of making information more readily accessible on the Internet for people with disabilities.

4. Breaking Down the Barriers

4.1 Who is Gaining Access?

If potential learners with disability are to engage successfully with Information and Communications Technologies (ICTs), fundamental changes are required in the way in which information is presented on the Internet. According to Kaye (2000) it is users with disabilities who can potentially gain the most from new technologies, yet in the USA they have the lowest rate of participation. Kaye found that amongst the 20.9 million Americans who are aged 15 and over and who have a work disability, only 5 million (or 24 per cent) of these people have computers at home, and only 2.4 million (or just over 11 per cent) have access to the Internet. He identifies the reason as being one of poor financial status. Many people with disabilities may not be able to afford a computer, or the required assistive technology to adapt a computer to their individual needs. In addition to this are the charges required to gain access to the Internet. He also suggests that many are not aware of the potential benefits of the Internet "a computer and an Internet connection could become not a toy, but an important tool with which to gain greater independence and social integration" (Kaye, 2000).

Of the many potential reasons for lack of web access amongst people with disabilities (in addition to those cited by Kaye above) it is important to consider how the design of web pages may either facilitate or hinder access.

4.2 The Web Accessibility Initiative (WAI)

Designing a website in a particular way can help to ensure access for people with certain types of disability, including those with visual disabilities, hearing disabilities, physical disabilities and cognitive or neurological disabilities (Foley, 2003, p.3).

The World Wide Web Consortium (W3C, 2004) has developed a comprehensive list of guidelines in an attempt to standardize a number of web related technologies, such as Hypertext Markup Language (HTML). These guidelines include the Web Content Accessibility Guidelines (WCAG) which, although not a legal mandate for web designers, none the less provide a comprehensive set of guidelines, each with different levels of checkpoints, thus enabling web developers to ensure that they meet the accessibility needs of (all of) their potential clients.

5. Conclusion

This paper has explored the ways in which distance education can be both opportunity and constraint for people who have a disability. The way in which people learn is changing. This has implications not alone for learners but also for the way in which distance education and indeed learning more generally is conceptualised. What was once considered a very solitary practice is now understood more in terms of a collaborative process, one which sees learning therefore as a social practice, a practice which hopefully will encompass inclusivity rather than exclusion for all learners, including those who experience marginalization within our societies.

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BUILDING DIGITAL BRIDGES FOR PEOPLE WITH DISABILITIES

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Introduction

The paper presents the methodology of the REMOTE (Retail Education Mechanism for On-Line Training in Europe) Web Design course for people with sensory disabilities, as part of the lifelong learning policy of equal opportunities.

The activities were carried out during a Leonardo da Vinci pilot project which is an innovative ICT educational product aimed at supporting learners with disabilities to develop necessary skills for entering and remaining in employment. The project created a different and unique partnership by bringing together SMEs from UK, Spain, Germany, a large technical University from Romania and an accreditation body from UK.

Universal Design

As the team experience in developing IT applications for people with disabilities was limited, universal design solutions were first applied.

A Web resource that is effective and aesthetically rich for people with disabilities is likely to be effective and aesthetically rich for other people too. The reverse is not true, as attested by the current state of the Web: People with disabilities are three times less likely to complete routine tasks than similarly experienced peers without disabilities (Slatin, 2002).

There are many examples in society of innovations that were originally intended for people with disabilities, but that have provided access benefits to everyone. Curb cuts and automatic door openers are common examples from the built environment. There are many additional examples from the World Wide Web.

A formal definition of universal design is "the design of products and environments to be usable by all people, to the greatest extent possible, without the need for adaptation or specialized design" (Center for Universal Design). When applied to the Web, this practice results in web content that is accessible to the broadest possible audience, including people with a wide range of abilities and disabilities who access the web using a variety of input and output technologies.

The following are a few examples of how universal web design benefits all users:

- Text alternatives to visual content (e.g. providing ALT tags for images) benefits anyone who does not have immediate access to graphics.
- Text alternatives to audio content (e.g. including captions with multimedia) provide access to people with limited or no access to sound output.
- Avoiding use of colour to convey essential information ensures that the information is accessible to those who can not reliably differentiate colours.
- Using high contrast foreground/background colours benefits those with visual impairments, but most other users will also enjoy reading your site without squinting or experiencing eye fatigue.
- Avoiding flashing animations at frequencies between 2Hz and 55Hz reduces the risk of inducing seizures in individuals who are susceptible.

- Using relative rather than absolute units (e.g. percentages not pixels) ensures that content fits well regardless of resolution.
- Clarifying natural language usage.
- Providing a clear, simple design, including a consistent and intuitive navigational mechanism, benefits a variety of users with disabilities.

Disability/Accessibility

In this context terms as accessibility and disability needed to be clarified, that before talking about *accessibility* it would be useful to define *disability*. "People are not *disabled*", wrote Alan Cantor. Rather, disability is what we call it when functional limitations (of sight or hearing, for example; or of movement, speech, or cognition) encounter "design flaws in the environment" (such as something that assumes a specific sensory modality or physical capability) (Slatin, 2002).

New virtual learning environment (VLE) with course information and blended learning to distance learning where entire courses are online is the model used very much these days by different educational institutions. This type of curricula needs to be accessible for all learners and this is a complex issue but in fact the most often used medium for teaching and learning – that of printed textbooks – could be considered the most inaccessible. It is hard for those with print difficulties such as low vision or specific learning difficulties like dyslexia to access paper based text without the use of other technologies such as magnification, coloured overlays or scanning optical character recognition programs to enlarge the text or have it read by a computer. By digitising content, teaching resources can become interactive and accessible to many more learners. Computer based text separates the content from the display element allowing for increased flexibility. What is seen can be embellished with audio files or text to speech. Learning support components with summaries and keyword highlights can be embedded and hypermedia can lead to further interaction.

Also many students with dyslexia (part of our target group) experience difficulties related to the processing of written language information. These problems are sometimes compounded by short term memory difficulties, a lack of organisational skills and time management issues which all impact on learning within an on-line system (Draffan, 2004). The clear presentation of materials is vital, with good navigational assistance and a variety of multimedia options to tap into both visual and auditory skills and support developing coping strategies but if possible they must not be seen to be changing the learning outcome.

The REMOTE application and in fact the entire project is trying to fill in the gap of VLE for disabled learners and these are issues to which the development team was aware.

Regulations

Some countries have had policies relating to accessibility of information technology for a number of years – such as the United States, where US Section 508 Rehabilitation Act is applied in different aspects of life.

W3C (the World Wide Web Consortium) have been trying for more then 5 years through his Web Accessibility Initiative (WAI) working group to set guidelines which will help developers to create accessible web pages.

They say: "The overall goal is to create Web content that is perceivable, operable and understandable by the broadest possible range of users and compatible with their wide range of assistive technologies, now and in the future". The basic principles include:

1. Content must be *perceivable*.
2. Interface elements in the content must be *operable*.

3. Content and controls must be *understandable.*
4. Content must be *robust* enough to work with current and future technologies (WCAG 2.0).

Europe became particularly active during 2001 and 2002 in the area of Web accessibility, with all fifteen of the European Union (EU) Member States plus a number of EU Affiliated States adopting the World Wide Web Consortium (W3C), Web Accessibility Initiative (WAI) Web Content Accessibility Guidelines 1.0 (WCAG 1.0). In 2003 the EU adopted the "Equal opportunities for people with disabilities: A European Action Plan" which is acting as a continuation of the European Year of People with Disabilities 2003 Paper. The main features which are seen as a general aim for the REMOTE team are:

- inclusion of people with disabilities, electronic and information technology accessible to people with disabilities;
- lifelong learning to support and increase employability, adaptability, personal development and active citizenship;
- new technologies to empower people with disabilities and therefore facilitate access to employment (EU, 2003).

Application Development

The methodology and the application are the result of research activities carried out in 4 countries through a unique partnership of universities, SMEs, national awarding bodies, NGOs and European Disability Forum.

An innovative solution was developed that tackles the needs for training among disabled people by: providing flexible, home or work based training, enhancing the employability of individuals through increased levels of qualifications in a growing area of the labour market, and supporting increased self-esteem of those participants through increasing their social participation in the workforce.

Working in partnership between UK (Ethos Assoc. Ltd., NFCE), Spain (Theta Education and Training S.I), Romania ("Politehnica" University of Timisoara) and Germany (Language Service Center GbR), the product is produced and will be delivered in all partner's languages. It will be supported via parallel national accreditation or awarding body endorsement in UK, Spain, Romania and Germany.

The specific nature of the content – web design technology – will enable SMEs to access a new training package accessible by all learners, and will also encourage disadvantaged learners who are homebound to develop a skill marketable through self-employment, infact building digital bridges in a direct view of respecting equal opportunities.

Some relevant learning methodologies are incorporated into "REMOTE" learning product. The methodologies focus on developing the ICT skills of disabled people. The methodologies area result of an intense research done in all partner countries in conjunction with the established Disability Forums. Through consultation with disability support groups, such as the European Disability Forum, the product is continually assessed for relevance and appropriateness for the target group, and will seek to continually update and improve, and expand capabilities for supporting specific needs, such as facilities for the visually impaired.

The application, 'Removing Barriers' developed in English, Spanish, German and Romanian, uses an integrated fat/thin delivery mechanism which utilises a media-rich CD with low bandwidth on-line content from a central on-line learning hub (www.removingbarriers.com). It comprises 5 modules with courses about the Internet, the application Macromedia Dreamweaver, Web design, creating and uploading Web sites.

Figure 1. A course page from Module2

The on-line Learning Hub provides update information, access to a glossary, the assessments and the communication and tutor support.

The eLearning course addresses the strengths and weaknesses of the disabled learner including design elements that will help to support him, e.g.:

- clear text on a suitable/changeable background;
- zoom Function, Cursor Modification, Changing Backgrounds, Printing Summaries;
- strong use of graphics/symbols and illustrations as well as keyboard keys to help navigate the course;
- course materials 'bite size';
- registration forms, Chat rooms and Forums, Examination and Tutor Support System.

The technical development is based on new methods and applications done in several multimedia programs as Macromedia Flash, RoboDemo for the CD application, while the Internet one uses MySQL database and PHP server-side scripting technology, as dynamic content generation technique. The course is built as a protected database with different levels of access for tutors and learners.

Testing

The testing of the 'Removing Barriers' application was done in several steps as an in-house testing and as an external testing process. The general aim was to test the basics of accessible Web design, assistive Web technologies, and how individuals with disabilities use the Web.

We applied the Seven Step Process of testing (Smith, 2003):

1. *Validate the HTML*
   The first place where we validated the HTML, was to use the W3C's HTML validator at http://validator.w3.org/. The application passed this test.
2. *Validate for accessibility*
   There are several tools (some free) with which you can test the accessibility: the Wave accessibility tool – http://www.wave.webaim.org/, Bobby (http://bobby.watchfire.com/), HiSoftware's line of products (http://www.hisoftware.com/) or InFocus (http://www.ssbtechnologies.com/) – the last 2 validate the entire site. The Wave provides

useful information about accessibility features and errors within one page. The Wave (or any other software-based validator) cannot check all accessibility issues, but it checks nearly everything that can possibly be checked in an automated process. This is why it is not considered a reliable tool in itself, but just as a step in the testing process. In the same time all the 3 design versions of the application (from which the user can choose and customized his application) were tested for accesibility validation.

3. *Check for keyboard accessibility*
   You can navigate inside the application by using keyboards with the letters which correspond to different tasks (e.g. 'n' – next) and these tasks are presented and explained to the learner in the 'Getting started' Pre-module.
4. *Test in a screen reader*
   This is done using different screen readers as TextHelp, Read and Write. The screen reader accessibility was one of the main objective on the 'Removing Barriers' application development and in each development step, testing was performed.
5. *Check the pages for WCAG compliance*
   The WCAG are a very complete set of accessibility guidelines. They are so complete that sometimes it is nearly impossible to comply with them. Though some of the guidelines are rather vague, trying to comply with them gives us a good idea of what it takes to be truly accessible. We manually evaluate the pages against these guidelines. The WCAG guidelines are broken into three priority levels, based upon level of importance or impact on accessibility. At very least, we meet the Priority I and Priority II guidelines. The Priority III guidelines are more of a wish list for accessibility, and they are not very possible to be implemented in this application as this is not an assistive online technology.
6. *Conduct user testing*
   The first trial – for testing the user interface and the usability – of the English version performed in September 2004 on a British group of mixed disabilities (sensory – visual impairments, and dyslexia) had positive result. The accessibility of the product is high, it is Screen Reader friendly and the design and functionality of both CD and Learning Hub were much appreciated.
7. *Repeat this process*
   Web accessibility is a continual process and we intend to continuously repeat the process as different other tools and modules will be added in the near future.

Challenges

During development the team needed to overcome several challenges:

- the subject novelty in relation with people with disability;
- the use of the graphics for people with visual impairment;
- the general user interface for fulfilling several disabilities requirements;
- the un-available customised solutions and software for people with disability;
- different technical solutions (real-time simulation with direct user interaction, multimedia performance based questions in the assessment, tutor support).

The experience gained during this project development will be implemented in other future products designed for the same target group.

Conclusion

As a result, an application which respects the universal design rules was created. The application does not provide helpful features just for our target group (people with sensory disabilities), but it is also a friendly application for first-time users, young children, or mature adults with low IT skills. The product will be the first retail education product of its kind, targeting specifically disabled learners across Europe seeking to enter or progress in the labour market, and endorsed and supported by a national (UK NCFE) awarding body. The product is compatible with current standard Internet provision found in homes and businesses across Europe. For more and actual information please visit the project website at www.removingbarriers.org.

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LEARNER SUPPORT IN LITHUANIAN DISTANCE EDUCATION

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Introduction

Distance education, as defined by Michael Moore (1996) is "planned learning that normally occurs in a different place from teaching and as a result requires special techniques of course design, special instructional techniques, special methods of communication by electronic and other technology, as well as special organizational and administrative arrangements".

Learner support comprises all assistance provided by distance education or e-learning system which is provided for learners in order to help them to reach their learning objectives. Thus we understand here the learner support system as all integrated support means and tools which, according to M. Thorpe (2002) refer to "the meeting of needs that all learners have because they are central to high quality learning – guidance about course choice, preparatory diagnosis, study skills, access to group learning in seminars and tutorials, and so on. These are the elements in systems of learner support that many practitioners see as essential for effective provision of ODL ('open and distance learning', auth.)."

The aim of this article is to examine how learner support provision influences effective distance learning in Lithuania. Therefore, it is necessary to find the research findings proving the support as a success factor for effective learning and to analyse learner support provision in Lithuania by performing the survey among teachers and learners.

Methodology of pilot study is based on the survey which was performed using an online questionnaire designed during the implementation of Phare project "Development of DE in Lithuania". The online questionnaire was sent out to all Lithuanian Distance Education Network (LieDM) classes to be filled in by DE learners. It was responded by 55 learners who were currently participating in DE courses delivered via LieDM network at the time, and they represented various education institutions from all over Lithuania. Thus now we will look at the learners' responses and indication of the support provision situation in Lithuania.

Distance Education in Lithuania

Distance Education (DE) in Lithuania is based on LieDM network (http://www.liedm.lt) which joins almost all universities and colleges, and several vocational schools as well.

There are two major forms that are most popular in distance education delivery in Lithuania: 1) completely online learning or blended learning designed using virtual learning environments (WebCT, Learning Space, First Class and others) and 2) video conferencing. Video conferencing network developed during LieDM project is the basis for video conferencing support system all over Lithuania.

DE courses and programmes provided in the country vary in their content: courses developed to improve computer literacy skills ('Computer literacy and MS Office professional skills', ECDL courses, 'Basics of WebCT', 'Basics of HTML', 'Information search and the internet'), DE methodology courses for DE providers, professional qualification courses and programmes, and others. Only in LieDM network, there were 392 distance learning courses developed during the period 2001-2003. The main subject areas cover informatics, economics, medicine, technology, social sciences, humanities, nature, politics, law, mathematics, and other areas. On the basis of the data presented by Lithuania institutions of higher education, there are more than 230[1] courses of formal and non-formal training suggested for distance learning via virtual learning environments all over the country.

Learner Support as a Factor for Effective Learning

Though there is quite a number of DE courses and programmes developed in the country, there is no evidence or sufficient research performed to evaluate the efficiency and learning outcomes of DE course participants. Moreover, there is no research performed to identify the main factors for successful distance learning, and the criteria to perform learning quality evaluation are not set up either.

Charlier & Perraya (2000, cited by Poumay, 2004) define learner support as "all the functions, roles and tasks aiming at guiding, helping and supporting the learners engaged in a training system partly or totally at a distance in achieving all the individual or collaborative activities". Salmon (2003) says that "online learners do not wish to do without their human supporters". Tait (2003, cited in Keegan, 2004) also identified in his research that students want support, and that "student support, especially student guidance and counselling, tutor support, and effective information and administrative systems all provide a range of activity that impacts not only in terms of teaching but also affectively, that is to say reinforcing the students sense of confidence, self-esteem and progress".

Thorpe (2002) distinguishes between 1) learner support which is traditionally "seen as that which happens after the course materials have been made. Its function is usually defined as enabling learners to study successfully and to develop their own understandings of the material", and 2) learner support as "the range of services both for individuals and for students in groups which *complement the course materials* or learning resources that are uniform for all learners" (Tait, 2000, cited by Thorpe, 2002).

Thus we will focus on the definition of learner support provided by Thorpe which comprises "all those elements capable of responding to a known learner or group of learners, before, during and after the learning process" (Thorpe, 2002).

To evaluate the influence of support on course quality and learning outcomes, researchers and scientists suggest asking for learners' opinion on learning preferences and their evaluation. As Thorpe indicates, "questions about what courses are 'really like' can be answered by ex-learners, who represent an enormous resource for information sharing and informal social contact" (Thorpe, 2002). Another research presented by U. Ehlers (2004) also confirms that in tutor provided support "quality preferences are represented [by learners]… towards the communication and cooperation with the tutor of an online course.

The survey shows that tutor support for learners is very important in general – regardless their other preferences: between 74,4% and 97,7% of learners in the different preference groups value tutor support in general as important or very important. However, there are great differences among learners as to how the tutor support should be performed". As a conclusion of the research, Ehlers indicates that "future quality development in e-learning has been oriented at the learners' needs and situation. No longer general criteria or the same guidelines for all learners can be applied, but individual services are needed" according to their individual needs.

The Learners Perspective

As the learner support is being provided in three phases: before the learning process starts, during the learning process and after it, we will base presentation of situation in Lithuania in this field on this structure.

[1] Not all the courses are registered as study programmes, but they are delivered in formal and non-formal education programmes.

Before the Learning Process

It is important to know what most recent learning demands among Lithuanian population are for DE courses and programmes, whether they meet the future learners' needs and what kind of support learners receive before the learning process starts.

The survey participants were asked to respond what they think about distance learning availability for Lithuanian citizens. 28 learners indicated that DE is available for Lithuanian people, 5 learners had no answer about this, and 22 learners responded that DE is not available to their mind, and indicated the main reasons for this being irrelevant topics of existing courses, limited target groups, no practical training, lack of information on existing training possibilities and expensive internet connection, which are indicated in Table 1.

Table 1: Why DE is not available in Lithuania?

Expensive internet connection	19%
Lack of information on existing offer	23%
DE courses are not focused on practical training	16%
Courses are mainly related with higher education	29%
Topics do not correspond to the user needs	13%

Table 2: Search for information on DE

Internet	84%
Websites of institutions of higher education	56%
Websites of education institutions	29%
Newspapers and advertisements	20%
No answers	5%

Another question was raised where the future learners look for the information about existing learning options. There are certain data bases and distance learning course catalogues in Lithuania and Europe, including information about existing courses:

- Lithuanian Distance Education Network course catalogue (http://www.liedm.lt);
- Lithuanian Association of Distance Education (http://www.ndma.lt);
- Distance Learning Course Finder (http://www.dlcoursefinder.com) for searching of distance learning products in Europe, and others.

The answers showed that people who decide to undertake distance learning, usually search for the information in newspapers, websites of education institutions, websites at institutions of higher education, but the majority of the respondents use internet for this kind of information (Table 2).

Before the learning process, the following participants are present in facilitating the future learners to find and get registered for the courses/programmes:

- Institution support system (shareholders, decision makers, course authors, administrators, and mangers[2]):
  - Administration. Its purpose is to implement and supplement formal requirements of DE.
  - Management. Its purpose is to find a customer for the teaching/learning process and form a team who will deliver the course.
  - Creative-authorial. Its purpose is to model/form the course of distance education, to plan learner support from the point of view of methodological and technological aspects.
- Distance Education provider (tutor, supervisor):
  - Set realistic learning aims, corresponding their learning needs, communicate them to students, and select relative practical methods for achieving them.
  - Plan learning/tutoring process provision.

[2] These participants and their qualifications and functions are not clearly distinguished in different institutions, and thus their responsibilities often overlap.

Learning and teaching information and rules are set up in advance before the learning process starts including preparation of:

- Motivation material (description of competences and skills that will be developed during the learning process, establishing the certification and accreditation documents, and other material).
- Study schedule and necessary information (study guide, course guide, tutor guide, presentation of learning environment and learning methods, introduction to necessary technological skills and pre-requisites necessary for successful participation in the learning course/programme).
- Other necessary information for the learners.

The respondents were asked when and how they were provided with the information about DE course/programme that they became involved in. 20 respondents indicated that they were provided with this information *before* the course, 20 – *during* the course, 4 respondents *do not remember* about such support, 9 respondents did not answer and 2 replies indicated that there was *no such information provided.*

However, we should acknowledge that there is no commonly accepted distance education course monitoring system in Lithuania, as there is no public information on available courses and whether they are really delivered, how many participants they have and other statistical information.

During the Learning Process

Although the DE materials should meet the course objectives and be self-contained, materials alone are unlikely to fulfill all students' needs. For this reason, tutor and administration support is required to manage learners' experience, encourage, explain further, test and motivate them. Support can be applied at different times and can come from several different sources: course materials and guides, administrators, tutors other students and institution support structures.

Thus the following participants are present in providing learner support during the learning process in Lithuania:

- Institution support system (administrators, and mangers):
  - Technical maintenance. Its purpose is to ensure the quality of communication of all teaching/learning process participants using technical means.
  - Administrating learning. Its purpose is to take part in the learning process and ensure smooth communication with the learners and participation of all learners[3].
- DE provider (tutor, supervisor):
  - Teaching. Its purpose is to keep to the frame-work of a subject/theme in a specific course process.
  - Define his/her role in supporting students and promoting their learning achievements.
  - Identify ways of enabling students to manage their own development according to varying degrees (the services to be provided).
  - Monitor own performance in relation to the achievement of the aims.

Only some institutions in Lithuania have their internal competence and professional qualification standards, and not all distance learning providers and participants are aware of existence of such standards at their institution.

The respondents of the survey were asked to identify the support that was provided to them during the distance learning process. Their responses and perception of support may be observed in Table 3.

[3] Again, the administration rules and administering of learning process is very individual in each DE providing organisation.

Table 3: Support provision during the learning process

Informed about existing learning possibilities in their institution	11
informed about learning possibilities in the country	4
Informed about learning process, methods, evaluation before learning	20
Informed about communication and evaluation rules	14
Informed about logging on to the course	23
Organized group work	15
Planned learning process and tempo in advance	12
Planned learner support in course design	8
Provided constant feedback in time	12
Provided possibility for improvement and task polishing	13
Issued certificates on completion of studies	6
Performed constant quality evaluation	7

Some institutions use additional means and tools for learner support, which allow deeper learner profile analysis and research on learning process. These instruments and tools include *learner data basis* with registration data on learners needs, *learner journals* where learners fill in the data on actual study time and metareflection data, *questionnaires* to be filled in by learners before and after the learning process, in order to follow learner satisfaction, *tutor journals* to follow tutor workload and learners' active participation through the course delivery process, and also to detect early leavers and '*lurkers*' in the course, and other tools (online surveys, timesheets, and other documents).

However, there are no commonly accepted methodological quality requirements for distance education courses developed in Lithuania. Each institution or partnership developing DE courses sets up the criteria by themselves.

The survey respondents were asked if they were satisfied with DE courses/programmes that they participated in. 30% of the respondents answered that they were not satisfied with distance learning. They indicated such reasons for their dissatisfaction as lack of tutor support (25%), not acceptable learning method (25%), lack of practical tasks (25%), lack of time or inability to manage time necessary for studies (37%), inability to apply learning outcomes after the course (25%), the course was boring (37,5%) and did not correspond to learning needs (27%).

After the Learning Process

After the learning process is over, it further depends on the learning profile what learning path is undertaken by the learner. Learners are suggested to precede their studies in further programmes and courses, and the information about such possibilities is available at the training organisation (website, leaflets and information boards). Moreover, learners are introduced with the people who had completed the course or the programme earlier so that they can receive as much information, as possible on the use of the courses or programme for their personal development. Some institutions have journals and log-books to follow the learning process of their prior participants in case they return to other courses and programmes provided by the same institution. This is usually the main factor that distance education delivered for them was useful and they come back to gain more practical skills to become independent actors.

The main benefit and support provided for the learners after their learning process is the experience and information that is directed towards their sustainable individual learning path. The learners are at the stage when they had perceived their responsibility for self-learning, and DE providers are in charge to direct them in this process further on.

Conclusions

Learner support is provided in different forms in Lithuanian DE. The learners, survey respondents, indicated that it influences the successful learning process and that lack of support may influence negative learning impressions and failure to reach desired learning outcomes. They place support factor among other important learning success factors, such as practical and applicable learning methods, course content corresponding to learning needs and accurate planning and delivery of learning according to reasonable time schedule allocated for learning.

Learners indicate that information provided on learning possibilities, learning process, as well as regular and timely feedback are the constituents of effective support provision. They also agree that learner support should be provided *before*, *during* and *after* the learning process, though the findings prove that not all institutions, DE providers, implement this. Moreover, the weakest support provision phase is *after* the learning process ends, when poor or no support at all is provided for the learners.

There are no terms of references set up for the tools and methods on how to do this. Each institution has set up individual learner support systems, and experience and resource sharing among institutions would be beneficial for all DE participants, as they would allow to save resources and to improve the quality.

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E-LEARNING AS A CATALYST OF MENTAL TRANSFORMATION IN THE SOCIETY OF CAREER COUNSELLORS – BASED ON POLISH VIRTUAL UNIVERSITY EXPERIENCES

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Introduction

The aim of the article is to present e-learning as a tool of transformation in the societies hardly subjecting to the social and political changes. Experiences described in the article result from the cooperation between Polish Virtual University and Polish Voluntary Work Corps that was initiated in 2004.

It is to be started with a short presentation of the institutions involved in the project – the institutions which coexist in the Polish political, legal and educational reality, even though they belong to the two completely different social environments.

Polish Virtual University, established in 2002, is a joint e-learning research and educational project of the Academy of Humanities and Economics – a private college from a city of Lodz, and a well established University of Maria Curie-Skłodowska from Lublin. Main area of PVU activity concerns organisation, design and conducting on-line studies provided on an Internet distance learning platform. The study programmes cover four main faculties – political science, management and marketing, computer studies and nursing. We offer also post-graduate studies and numerous open continuing education courses.

Students of PVU graduate with a diploma of the Academy of Humanities and Economics in Lodz which has been renowned as a higher education private college since 1993. Starting with 1994/1995 cohort of 150 students, AHE recruited 21,975 students in 2004. The 13-year-long history of AHE is a good example of the transformational changes in Polish social and political life after the collapse of the communist rules in the year 1989. It has been a challenge to build a dynamically developing private-owned higher education institution which is at the top of ranking lists of the best private colleges in Poland. For such an innovative enterprise to be successful in a newly developed democracy, it required a lot of determination, flexibility, creativity and a good understanding of the needs of the society undergoing the difficult process of transformation.

The same kind of challenge was to be met by the public institutions in Poland. One of them is an organisation named Voluntary Work Corps which has been successful in identifying the need to redesign its activity focus at the times of transformation. State financed VWC is one of the elements in the state system of upbringing, training and vocational education. VWC activity focuses mainly on the youth from the disadvantaged groups, people lacking social support, poverty-stricken, socially unfit, unemployed and discriminated. VWC addresses the needs of the underprivileged, offering them a possibility of coming back to school, re-education and finding employment. Another equally important area of VWC activity is helping school leavers make the first step into the labour market. Still a different area of VWC activity is a part-time holiday work offer addressed to adolescents allowing them to gain considerable vocational experience. Due to the high unemployment level in Poland (up to 18.7%)[1] and the overall difficulties job seekers face, the presence of Voluntary Work Corps in the Polish society is highly recognised and appreciated.

[1] Central Statistical Office data from November 2004.

History of Voluntary Work Corps

To understand the way VWC has been functioning and the way it has been managed, it is important to look back upon its history. VWC grew from the tradition of Scout Work Corps founded in 1936 whose main task was social and civic youth formation and general education as well as basic military and support military service training provided to the unemployed youth. However in the broader national context VWC is deeply rooted in the history of The Polish People's Republic (communist times).

It was impossible to adapt the mission of pre-war Scout Work Corps into the reality of a communist country which officially denied the alien phenomenon of unemployment. It was not necessary then to fight or prevent it. However there were other tasks to be fulfilled by the Voluntary Work Corps founded in 1958. These were: to support development of the national economy and to provide young people with the possibility of gaining basic work experience. Pupils and students were involved in railway, main and factory building. In most of the cases those 'work experience gaining' actions turned into a communist absurd. In many schools annals there are still to be found photos of smiling students taking part in potato or wheat harvest, ditch digging or other 'vocational skill developing actions'. Talking about VWC as it was before 1989, we must consider it a landmark of the reality of a country ruled by the communists.

The period of transformation at the turn of 1980s and 1990s affected radically many institutions and VWC among them. In a new Poland, where unemployment and social pathology have become a known fact, this organisation has redefined its focus of attention, as it has already been mentioned. Mobile Centres of Vocational Information are one of the new initiatives of VWC.

Mobile Centres of Vocational Information

Mobile Centres of Vocational Information have been established to provide young people with the possibility to learn how to effectively plan their work career, acquire necessary knowledge and skills and to facilitate their flexible and active participation in the labour market. Polish youth will get an easy access to vocational and educational information, multimedia, computer programs, specialised training and courses, tools and methods of career planning and possible paths of career development. Mobile Centres of Vocational Information offer technological and professional support to all those interested in upgrading their skills and knowledge. They provide assistance in finding best solutions for members of disadvantaged social groups looking for vocational courses, schools, re-education, lifelong learning etc. Mobile Centres of Vocational Information act in two modes – they invite people to the centres which are organised within the structure of VWC in most big cities or actively operate in deficient and economically neglected areas of the country moving from town to town.

Workers of Voluntary Work Corps delegated to Mobile Centres of Vocational Information were to participate in post-graduate studies of career counselling. That was when the two bodies – Academy of Humanities and Economics and Voluntary Work Corps met for the first time.

E-learning – Episode One. VWC versus PVU

The post-graduate career counselling studies programme covered the issue of information management and technology supported learning. For the VWC students it was an absolutely new experience and the first time when they heard about online learning. Polish Virtual University was invited to cooperation and participated in the studies organisation.

We administered a pre-training for the students whose main focus was the Internet as an information repository and a communication platform. We presented PVU e-learning platform and its tools and discussed the main characteristics of modern distance education.

The students were interviewed after the training – the results of the survey[2] were devastating. 74% of the interviewed claimed that they found knowledge presented in the course of the training irrelevant or completely irrelevant in their work as career counsellors.

That opinion was even more paradoxical if compared to the question concerning the level of professional expertise presented by the trainers. 85% of the interviewed said that it was high and very high. Moreover we found other comments by the students:

- *"This was an interesting training, but I don't think I will have a chance to use this knowledge in my professional practice."*
- *"These classes and information are of no use in my job."*
- *"I can't see any practicality in this training..."*
- *"Classes are well-conducted, however the topic is not related to the work of career counsellors at all."*
- *"Thanks for advertising Polish Virtual University! Waste of time!"*

Online Course Design – Episode Two. PVU versus VWC

After that surprising experience, we realised that the task and the people we worked with required adopting a special approach. The resistance we observed made us redefine our role in the 'meeting of the two worlds'. We were to become more than a trainer or a tutor. We had to function as a medium bridging the gap between the old 'static' way of thinking and a new reality of modern information and computer technology.

After coming to such conclusions, we decided to take the next step in the direction of reformulating VWC existence conditions and adapting it to the reality of virtual environment. An online course was designed for career counsellors – "Development of vocational information management competencies for career counsellors".

The course was designed to make students realise the need and develop competencies in vocational information management. It was also aimed at giving career counsellors a chance to get familiar with the potential of the Internet and all the communication tools existing in the net. However useful, information portals', search engines', educational platforms' popularity seems to be restricted to the selected groups of users – in Poland still these had not been career counsellors.

The general idea of the course and all the course content was developed by PVU in cooperation with career counselling professionals and experts in information management. The course was designed as a three-part project – there were three practical tasks for students to complete. Students had to get acquainted with the theoretical materials, acquire knowledge from the three articles which were accessible from the course work-space in pdf format. The articles covered key concepts of modern career counselling and information management and were supposed to facilitate students' activity in the project.

After reading the articles, students used the knowledge to search the Internet and other electronic information repositories to find useful information for particular tasks of an active career counsellor completion, such as School Career Bureau running, design of vocational initiative activating programmes for school leavers, etc.

The next stage of the project consisted of information filtering and processing. Students were supposed to assess the actual professional credibility and value of the information found, which was a difficult assignment, taking into consideration the size of the Internet resources. Because of that, organisation and time consumption of the students' work were of the major concern.

[2] A targeted survey was conducted in July 2004. General population was 70 students and 69 persons were interviewed. The results may be generalised to the whole population.

Final part of the online course involved data analyzing and designing particular scenarios and training schedules for a particular group of people (high school students, vocational trainees, college graduates etc.).

The course was prepared in four parallel versions for four different teams of users. The versions were developed according to the same preconceived e-learning idea, but they differ in respect to the content of the assignments. Such variety allowed students to refer to a greater number of valuable Internet resources and also made the training more specialised and practically usable.

The critical success factor of the course was initial training for e-tutors whose job was to supervise and guide students in the online course. Each 20-people team was supervised by one e-tutor who was supposed to help, guide, control, direct forum discussions and manage work of the students. For the tutors (coming from the background of traditional didactics) running an online course was a new experience. Even though they demonstrated a high level of enthusiasm and devotion, PVU specialists invested a lot of time and energy in preparing them to a new role of an online teacher.

The selection of the major responsibilities to be taken by the tutors is as follows:

- proper assignment scheduling;
- initiating, guiding and summarising of forum discussions;
- student guiding and motivating (encouraging, providing help, providing extra materials etc.);
- consulting and answering students' queries, mails, etc. on forum and via e-mail;
- organising one-hour chat sessions every week and consulting students on chat in case of emergency;
- students' work control, tasks collection evaluation;
- informing students about the number of points received and providing them with their progress analysis, summarising students' work in the course.

The tutors were familiarised with the e-learning methods and presented with the Internet platform and all the communication tools available in the course. What is more, during the tutor training particular attention was paid to making e-teachers aware of their key role in the course. They were informed about the need for their increased activity as they were working with groups of 'e-learning beginners' for a relatively short time (four weeks). The importance of proper feedback and guidance provided to students was stressed very strongly. As it turned out, both groups of the course participants needed time to identify their roles and settle down in the new state-of-the-art virtual environment. However much energy was put into the online classes which were properly conducted by the attentive and vigilant tutors, the course itself seemed to be heading towards a complete disaster.

E-learning – Final Clash

The first days of the course were very difficult for the tutors and the supervisors whose job was to assist students and tutors in their work on the platform. The students comments were bitter, they were expressing strong dissatisfaction with the fact they had to participate in the course. Their anger resulted mainly from the fact they did not understand the idea of an online course and were unaware of the value of such a novel experience. The online tutors, however motivated, appeared unable to cope with the new task and soothe students' anxiety. On the other hand there were PVU course coordinators feeling frustrated by the necessity of answering hundreds of questions concerning functionality of chat, forum on the Internet platform and explaining the rules of the course many times to both students and e-tutors.

Even though the course structure had been carefully prepared and the schedule was available for the students in the course work space describing in detail the functioning of synchronous and asynchronous platform communication tools and the subsequent assignments to be completed, students kept asking absurd questions why they had been left alone on the platform, what time the classes started etc. Some of their posts on forums left us with a headache:

- *“What is going on in here??????”*
- *“Well, I’m starting a new topic on forum; will somebody join me????”*
- *“Where are the task? what shall we be doing?? somebody help!”*
- *“Help!! God, it is a nightmare!”*
- *“Hello! I’m in panic, I’ve been sitting on this all morning, still I do not know what to do; give me some hints now!!! Who made up such a stupid system of Internet studying!!!?????”*

These initial difficulties were slowly fading away, as the participants went on with the tasks and got familiarised with the platform. The forum communication was better organised and the new skills were slowly being developed by the students. The forum exchanges displayed the newly acquired online communication abilities and they concerned factual, content-related issues. Students and tutors finally defined their roles and settled in the virtual environment which resulted in four orderly online communities formation.

Moreover the level of engagement and activity in the course was very high, close to 100%. Students declared in less emotional forum posts growing satisfaction which resulted mainly from the completed and well assessed assignments, but also from the fact they realised how important an experience this could be for their professional development – the students got more proficient at net searching, information management and they appreciated the usefulness of the Internet resources and tools.

The course ended after four weeks of hard work as a complete success. The forum quotations prove it:

- *“Maja’s [tutor’s] optimism makes us work harder! Cheer up!”*
- *“How are you doing people?! it is not going to be that bad, I’ve done the tasks and it makes me happy :))”*
- *“Marcin K. and Magda K. are given a special award for their remarkable presentation and an exceptionally well prepared project! Congratulations!”*
- *“Hello everybody, I’m getting deeper into all this stuff about career counselling in the Internet and I’m startin to think it is cool. [...] Do you agree? I want to say that actually I’m just starting to use in practice the knowledge and what I’ve done in my project. Tomorrow I am having vocational education classes in a high school and I’m planning to use the two multimedia presentations I have prepared in the first stage of the project. They are ... well, good. [...] Anyway I believe our e-learning adventure will surely be of a great help in reality (it is bearing fruit already). Regards!”*

Finally it turned out that all students managed to prepare the projects and completed the course successfully. The tutors expanded their didactic competencies into the area of e-learning. This experience was a trial for all the parties involved – exploring the unknown is usually a risky enterprise. The result however appeared more beneficial than expected. Both students and the tutors admitted openly that the development of the information management abilities and practical knowledge of e-technology and e-learning contribute radically to the communication barrier elimination. Presenting students, clients and anybody interested with the possibilities and tools offered in the net is a crucial element of a career counsellor’s job nowadays, at the time of rapid transformation observed on the labour market in the countries of rising democracy and capitalism, such as Poland is.

Students were asked to answer a 5-question survey[3] at the end of the course. Analysing the survey results, we received a valuable feedback which confirmed us in the profound conviction that having organised an online course for career counsellors, we managed to reform and reformulate their perception of the technology and its potential:

[3] The survey conducted in November 2004 was targeted. The general population was 80 participants of the course. They were randomly paired. The number of pairs interviewed was 25. The results are relevant and may be generalised to the whole population.

- 88% of the interviewed students claimed they appreciated the chance to participate in an online course;
- 80% of the interviewed stated the course contained useful information;
- 100% of the interviewed claimed there is an urgent necessity to introduce modern technology into education and the work of career counsellors;
- 100% of the interviewed declared there is the will and the need of putting the newly acquired competencies into their every-day practice.

These results and all the comments we received during the course prove there is an urgent need in the society to design and organise online courses for users from different vocational groups.

Conclusions

The joint initiative of Voluntary Work Corps and Polish Virtual University is to be continued. The overall e-learning development strategy for VWC assumes continuation of the efforts aiming at popularisation of e-learning idea in Poland – a country, which having become a member of the European Community, has an ambition to participate in the global project of economic, educational and technological development. We believe that on the taken way, we will have to maintain the strategy of breaking mental barriers still existing in the structurally stiff social groups, which however operate a huge human potential which needs to be activated.

Polish Virtual University prepared a preliminary version of the e-learning strategy for VWC and the Mobile Centres of Vocational Information. Its realisation and content preparation will be supervised by trained e-counsellors. Our experience tells us e-learning is not to be treated as a means to an end – it is to perceived as a powerful tool that may be used to break stereotypes and facilitating individual and social development and integration of people coming from very different backgrounds.

We hope strongly that soon it will turn out that more and more career counsellors will base their counselling offices in the net and the info-ways they will build in the Internet will become a common medium of communication with their clients. Voluntary Work Corps is an institution which has been now absolutely convinced about the value of e-learning and the necessity of its rapid implementation in the vocational and educational area and there seem to be more institutions of that kind in Poland.

THE EVOLVING ROLE OF UNIVERSITIES: INCREASING OPENNESS AND RELEVANCE

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"Education is the best economic policy we have" – Tony Blair, British Prime Minister

Introduction

At the March 2000 Lisbon Council, the European Heads of State and Government set a new object for the Union for the decade ahead: that of becoming "*the most competitive and dynamic knowledge-based economy in the world, capable of sustainable economic growth with more and better jobs and greater social cohesion"* (European Commission, 2000).

The Bologna declaration of June 19th 1999 sits within this framework. In particular in this context, the declaration stresses the importance of a first cycle of higher education that is geared to the employment market and the development of a European dimension of higher education. This will be achieved through increased mobility of students, teachers and researchers and by the further development of an effective credit transfer system based on the existing European Credit Transfer System (ECTS).

The UK Government Paper *The Learning Age* (1998) draws more explicit parallels between lifelong learning and the economy as illustrated by the opening statement from Tony Blair, cited above. Developing the skills necessary for a knowledge economy, lifelong learning and widening participation are thus linked in various ways and for different reasons in recent European policy statements. What are the connections? First of all, as societies increasingly become knowledge-based it is clear that a larger percentage of the population will need the education and knowledge to operate in this kind of society. Secondly, university education has a core role in providing the skills necessary for the economic, social and environmental development envisaged by the Lisbon council.

This paper reflects on the changing role of UK Higher Education in the context of European policy initiatives, discusses examples of success and failure and reflects on the impact and role of distance education on the agenda of lifelong learning, employability and widening participation.

The UK context

In the 1960s 7% of school leavers in the UK moved on to study at University level. The current national policy for widening university-level particpation is that 50% of those between the ages of 18-30 should have at least one year's full-time equivalent higher education by 2010.

Early successes

In the 40 years since the early 1960s a number of initiatives occurred, designed both to increase the numbers of students in Higher Education and, somewhat by default, to widen participation to include groups who were not traditional users of the University system. Some of these initiatives were notable successes. New campus universities were created, for example York, East Anglia, Sussex and Warwick, designed to add to the existing provision without departing too far from the traditional notion (at least in the UK) of a residential three year experience usually away from the home environment.

However in 1969, something rather remarkable happened. The juxtaposition of political will, the development of technologies and real educational imagination enabled the Open University UK to be created. This University swept aside many of the existing notions of Higher Education. It admitted students without entry qualifications, there was no campus, students studied at a distance in their own homes but at the same time had the opportunity of local tutorials and individualized personal support from a local tutor. The University was an immediate success admitting 25,000 students in its first year and settling down at its current student numbers of around 160,000 undergraduates annually.

There were other developments in UK higher education; in 1964 the Council for National Academic Awards (CNNA) had been established, enabling existing UK polytechnics to offer courses leading to CNNA validated degrees. During the period the CNAA operated, 885,200 awards of degrees were made and many of these degree courses were directly geared to future employment. The fact that the Open University, and the CNAA before it, were new made them aware of the importance of their quality assurance systems; it could be argued that the foundations of systematic quality assurance in higher education in the UK arose from the pioneering work of these two bodies.

In addition, it is now clear that the polytechnics and the Open University made a major contribution to widening participation in higher education in the UK and, in the polytechnics in particular, developed the notion of work-related lifelong learning.

Less successful developments

During the period 1980-2004 a number of other governmental initiatives have come and gone and it is interesting to consider what might be learnt from the experience.

- *The Open College.* The Open College was a governmental programme designed to replicate the Open University at a further education level. This eventually failed as a result of lack of resources; it was set up to be self-financing within five years and was unable to meet this target. However it did lead to two continuing successful developments: the National Open College Network, which provides accreditation and quality assurance for distance taught further education courses; and the Open College of the Arts, which teaches creative arts at a distance and which currently employs some 300 artists as part-time tutors. It also confirmed the valuable work being undertaken by the private, not-for-profit, National Extension College.
- *The Open Polytechnic.* In the 1980s a planning group was set up to develop the idea of an Open Polytechnic in the UK modelled much along the lines of the Open University, but it soon became clear that the distinction between polytechnics and universities was ever narrowing. In 1992, all polytechnics were made Universities when the CNAA was abolished by government, thus doubling the number of University places over night.
- *The UK e-University.* More recently the UK e University was established in 2001 with the objective of making UK universities' courses, especially masters level courses, available on-line on a global basis. However it never recruited sufficient students or support, even though all but four of the UK Universities each took out a 1 million pound share. In June 2004 it was closed down with the Chair of the Higher Education Funding Council, Sir Howard Newby, commenting that *"In hindsight it was clear that on-line learning on its own was not as popular as predicted and there had been a number of e-learning failures by universities in the US. What students wanted was 'blended' learning where on line materials were backed up by conventional teaching" (Macleod, 2004).*
- *The National Health Service University (NHSU).* In 2003 another governmental initiative saw the establishment of the National Health Service University (NHSU). This was designed to provide the higher education required for all the NHS employees, except the initial training of nurses and doctors. This has now been gently shelved after strong opposition from NHS professionals and other Universities and replaced by a new NHS Institute for Learning, Skills and Innovation.

Current and continuing developments

Learndirect

In 1999 the government sponsored 'University for Industry' was created from which the organisation **learndirect** was created. This is a network of online learning and information services. It is aimed at anyone over the age of 16, including:

- "Those working in companies who wish to improve their work place skills.
- Those who are seeking work and wish to improve their employability.
- Those who feel excluded from the world of education.
- Those who feel excluded from our digital society.
- Those who simply wish to learn something new (www.learndirect.co.uk/)."

There is no doubt that **learndirect** has been successful and ground-breaking with 80% of its courses on line and a network of **learndirect** centres in locations such as shopping malls, pubs, colleges, football clubs etc all backed up by a 24 hour 365 day a year helpline. It operates mainly at the basic and further education level, offering for example courses such as the European Computer Driving Licence, but increasingly it is offering vocationally related courses at higher education level.

The introduction of Foundation Degrees

These new degree programmes are another government initiative with the twin aims of widening and increasing participation and producing graduates who are needed within the labour market to address skills shortages. The characteristics of Foundation Degrees, which produced their first graduates in 2004, are as follows:

- they are two years in length or its part-time equivalent (240 Credit points or 2/3 of an honours degree);
- they are located within the intermediate level of the England and Wales Framework for Higher Education Qualifications (FHEQ) They do not however, represent an end to the first cycle of higher education qualification as set out in the Bologna declaration and further study and assessments are required to complete the first cycle which in England is typically represented by the award of a bachelors degree with honours;
- they integrate academic and work-based learning through close collaboration between employers and programme providers;
- they are designed to appeal to learners wishing to enter a profession as well as those seeking continuing professional development. Many programmes are offered in a flexible manner enabling learners to 'earn and learn' (Quality Assurance Agency, 2004).

There are around 200 Foundation degree courses now offered in England and Wales, many of which are franchised out to local colleges of further education. There is some evidence to show that both employers and students welcome this new approach with its clear work-related elements. Some Foundation Degrees are offered across the UK using a range of strategies involving the use of ICT, for example, The Open University programme for 'Early Years' and the University of Portsmouth's degree in Police Studies. Foundation Degrees are the only area of expansion of public sector undergraduate higher education in England and Wales apart from the increasing intake of non-European students. They could be seen as the response by the government to the demand for a more relevant and employer influenced higher education curriculum.

AimHigher

A related scheme, introduced in 2004, which builds on earlier government widening participation initiatives, is designed specifically to encourage different groups to think about the relevance of higher education to their aspirations. Projects include ensuring that there are clear progression routes and credit transfer schemes from further education to higher education, making higher education courses available in local further education colleges, introducing school children from the age of 13 to a university experience (Young People into Higher Education Schemes) by arranging visits and by using current university students to visit schools to talk about their experiences. How well this scheme works is still to be seen but there has been a substantial financial investment (see http://www.aimhigher.ac.uk/home/index.cfm).

Lifelong Learning Networks

The most recent government initiative is the proposal to establish Lifelong Learning networks in each region. These are intended to be groups of educational institutions which come together to "advance vocational and workplace progression into and through higher education" in the recognition that "there are far fewer progression opportunities for learners on vocational programmes than for those on an academic route" (Hefce circular letter 12/2004 http://www.hefce.ac.uk/pubs/circlets/2004/cl12_04/).

Delivering results?

This brief survey of UK government and other initiatives demonstrates that there have been major policies and strategies during the last 10 years both to widen participation and to increase the relevant skills base of University graduates and so enhance their employability. How successful have these initiatives been?

Widening participation

A recent government survey (Hefce 2005/03 http://www.hefce.ac.uk/Pubs/hefce/2005/05_03/), based on data collected on 18-19 year olds entering HE between 1994-2000, demonstrates that despite numerous government initiatives there has been very little significant change in widening participation. Indeed "what is especially alarming is that ingrained inequalities in higher education prospects have shifted so little over the six years" (THES, 21.1.05). The participation gap between the economically advantaged and disadvantaged has indeed widened in this cohort of students. And this is despite the numbers of 'younger' students now applying to the Open University. Nearly 11% of all students registered on undergraduate courses in 2003/04 were under the age of 24 (Open University press release, Media Relations Office PR4939 January 19th 2005).

Employability

Employers still need graduates with appropriate skills. The East of England Development Agency, for instance "can be described as a strong economy supported by a weak skills base… Learning and skills are key ingredients to increase the performance of the economy. The East of England needs to ensure that skills developments are better aligned with the needs of businesses today and in the future" (EEDA, 2005). Higher Education has been criticised for its lack of engagement with the skills agenda but in 2002, Universities UK and the Higher Education Careers Service produced a joint report 'Enhancing Employability, Recognising Diversity' which challenged employers to engage meaningfully with Higher Education. A more recent comparative research report, commissioned for the Department for Education and Skills, provides evidence that skills levels have improved in the UK, but that "there is still much to do as, despite the recent improvements, the UK still has the lowest proportion of the workforce qualified to level 2+ compared to the other countries studied". And the authors note that "the increase in qualification levels in the UK has been predominantly in general, rather than vocational qualifications" (Steedman *et. al.,* Dfes RB540).

Increasing lifelong learning

It is very clear from the UK experience that to achieve the participation rate of 50% by 2010, especially when linked to encouraging a wider cross section of the population to take up higher education, there will need to be some radical rethinking of the way in which the first cycle of higher education is planned and delivered. What issues remain and what role can distance and e-learning play in these contexts?

The curriculum

The curriculum offered by Universities in the past has not always been demand driven, whether from potential students or from employers and government. It now has to change in terms of content and mode of delivery if the twin objectives of widening and increasing participation are to be achieved. An increasing relationship between the needs and the involvement of employers in both developing the curriculum and assessing work-related knowledge, skills and experience is likely to be a key plank in any widening participation strategy. Foundation Degrees as described above are a central part of this approach. While work-based learning can present challenges to distance education institutions, it can also be welcomed by employers. The Open University has just been awarded recognition as a new Centre for Excellence in Teaching and Learning in the context of work-based learning for professional development (http://www.hefce.ac.uk/learning/tinits/cetl/final/show.asp?id=64).

The influence of mode of study on widening particpation and lifelong learning

However, it is the mode of study which is the major driver for widening participation. It is very clear that the targets required in England and Wales will not be reached unless there is a significant increase in part-time opportunities to study in HE. The Open University has demonstrated the demand for home based study for over 30 years and many Universities, especially the new ones, have made a major effort to change their timetables and administrative systems to enable lectures to be given at times which are convenient for those in paid employment or working in the home. However UK student funding still privileges full-time students against their part-time counterparts (see, for instance, THES, 29 October 2004, http://www.thes.co.uk/search/story.aspx?story_id=2016747).

Studying part-time has been a long tradition for many in the UK and across the world. London University's External Studies Department has enabled students in any country to take certain programmes of study since 1868 and it currently has 30,000 registered students globally.

However providing opportunities for part-time study on its own is not enough to ensure student success. Very few students and especially non-traditional students are autodidacts. They need carefully planned, focussed and systematic learner support. Even students in conventional universities need more support than they may currently be offered. A careers adviser at a sixth form college commented that very able students at some prestigious UK universities "find they are getting just a few hours of lectures and seminars a week. They feel they might as well save money and study at home through the Open University" (Telegraph 21.1.05).

In recent years many universities have been rethinking how best to support part-time students and the advent of effective learning management systems such as WebCT and Blackboard have enabled significant progress to be made in the areas of more effective support from tutors and in reducing the isolation of the part-time student.

The use of ICT in widening participation and in reducing social isolation

The design of blended learning systems which integrate the use of distance learning materials with face-to-face, telephone, written or ICT support if managed properly to avoid duplication and multiple costs is an important way forward. Many, if not all, Universities in the UK are using some form of web-based teaching in some of their programmes. For many this is still restricted to post graduate courses, e.g. the University of Leicester's global Master's programme in Museum studies, but it is clear that the distinction between distance education and traditional education is breaking down all the time, as has been discussed previously (Tait and Mills, 1999). Increasingly so called full-time 'on-campus' students are using CDRoms and web-based resources, while the role of the academic teacher is changing rapidly from one of content provider to learning manager.

It remains to be seen how the development of ICTs contributes to the improvement of learning and to enabling more people to share the advantages of a knowledge society. A major project run jointly by the Open University and the National Institute of Adult Continuing Education is examining the impact of ICT on social exclusion (http://www.niace.org.uk/Research/ICT/overcomingSE.htm).

Issues for lifelong learning and distance education

This review of current UK developments aimed at widening participation and increasing the employability of graduates raises a number of issues, particularly in the context of the lack of clear results in these areas. Among the issues raised, about which we would welcome discussion at the conference, are:

1. How far is there a lack of understanding of the educational potential of e-learning? Are ICT developments inclusive or are there still access and wider pedagogical issues?
2. Have there been too many government initiatives on a short-term basis? Is the UK alone in suffering from initiative fatigue?
3. How far does the UK lack of equity in funding for part-time students militate against widening participation? How are part-time students funded in other countries?
4. Institutions like the Open University and the Open Universiteit in the Netherlands which do not require entry qualifications have been in the forefront of widening participation. But, in the context of retention issues, how far does the 'open door' become a 'revolving door'? If students are very under-prepared should they be allowed to enter and fail?
5. What is the role of distance and e-learning in enhancing employability and addressing skills shortages?

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SOWING THE WINDS OF CHANGE – MAKING NATIONAL STRATEGY INTO LOCAL ACTION

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The Swedish Agency for Flexible Learning, CFL, is a national authority under the Swedish Ministry of Education and Science. The main objective for CFL is to enhance access to lifelong learning for adults through flexible learning. One way of doing this is by supporting development within local educational organisations in adult education and non-formal education.

In Sweden, education in practice is a municipal concern. At the same time strategies on lifelong learning, and adaptation of EU-strategies in the same field is a national concern.

A crucial question is how to implement national strategies on a local and municipal level. Over the years there have been a number of governmental initiatives within the fields of lifelong learning and flexible learning in Sweden. Experience shows clearly that top-down implementation of strategies tend not to survive, unless they are adopted in legislation or accompanied by large sums of money.

For an institution like CFL, with the objective of supporting development in local and regional organisations there are three main areas to focus on:

- Knowledge development
- Dissemination and implementation of knowledge
- Bring about change within these organisations

A very common way of working when trying to achieve these goals is to use the following tools:

- Funding of local projects to develop new knowledge
- Dissemination of knowledge through reports, seminars and web-publishing
- Crossing your fingers and hope for change to come about as a result of solving the two above tasks

The main task of these three is without doubt the third and last task. If nothing happens despite of all efforts with projects and dissemination, the authority has failed. Alas, experience shows that the above-described way to work is not very efficient. In short the main reasons for this are:

- Knowledge development
- Published reports and web information are not sufficient methods of dissemination
- Results from local projects are hard to disseminate as generally applicable
- Organisations are not keen on reading about and learning from other projects

The main problem with the above-mentioned way of working is that vital experiences from local activities takes a detour over the authority, gets transformed in to a rather abstract form, and is conceived as a top-down activity.

In order to overcome this situation, CFL has introduced a new way of working. Instead of acting as the main distributor of information, CFL now works as a facilitator of a network of networks. A national network of experienced practitioners forms the basis of an “Expert Network” that develops new experienced-based knowledge. A grid of regional and local organisations forms the foundation for local and regional networks that support development in organisations in their area.

The co-operation between local and national networks of practitioners is an essential element in the strategy. The local and regional network provides a very good resource for supporting the change process in an inexperienced organisation. But when it comes to the supply of knowledge and experiences asked for in a developing organisation, the collective knowledge and resources of a national network is needed.

The main principle for networking as a development tool can be described in a number of ways:

From the inexperienced organisation's viewpoint

The organisation facing the development and change process receives project funding from CFL. The economical support is not aimed at developing new knowledge, but to offer an economic base for the change process for one year.

The organisation is introduced to the actual local or regional network, and is provided with a mentor organisation and / or a physical mentor from a neighbouring organisation. The organisation is also offered access to the practitioners and organisations within the national expert network.

The organisation receives a number of support measures, e g in-house training, and seminars and so on. These activities are planned and performed by network members, but funded by CFL.

After a while the organisation begins to get more experienced and implements the new strategies into the regular activities. After some time of practical use of the new ways of working, the organisations role in the network shifts from being a receiver of support and experience to a contributor.

When the organisation has reached a sufficient level of experience, resources from the organisation can be used in order to support new organisations in a more structured way. For this work the organisation receives funding from CFL.

From the viewpoint of the local / regional network

Apart from the function of acting as a vital support for the new developing organisations, the local / regional network also acts a platform for the continuing development of the participants within the network. The network also acts as a platform for continuing seminars, training and local / regional reference group in various activities.

The co-operation within the regional network is not only based in sharing of experience and knowledge. It very often embraces more practical efforts, e.g. learning centre facilities, sharing of course content and so on.

The regional network also works as an interpreter of experience and knowledge from the national network. Much of the input from the national network has to be put into the specific preconditions that apply for the actual region.

From the viewpoint of the national network

In a country like Sweden there are not resources enough to establish a basis for regional knowledge networks. Within the field of flexible learning there are a number of issues that have to be taken into consideration. In order to cover all of these issues, resources have to be gathered on a national level.

The main issue in the national network is that it still is a network of practitioners that define their identity on a local and regional level. This is very important in order to prevent the effect of a top-down perspective. The experience and knowledge presented from and within the network stems from "the field".

For the participants, the national expert network provides an excellent platform for an ongoing discussion and development on spearhead topics within the field of flexible learning. The contact with regional networks and the developing organisations also provides a direct contact with actual needs and questions in different regions of Sweden.

The national network also has a direct influence on areas of priority for the work of CFL. The national network can also suggest and implement development projects, which then are funded by CFL.

Networking as a development tool has a lot of advantages; it provides a more direct way of disseminating and implementing knowledge, the resources provided answers directly to the needs of the field organisations, it is not conceived of as a top-down way of working, and it also provides a more modern way of co-operation between a national authority and its target groups.

For CFL, the role has changed into being more of a facilitator and co-ordinator. The authority still has a responsibility for quality assurance, and also sees to that the national strategies are fulfilled. But networks of practitioners, who are the ones that in the end have to do the work, design the way in which these strategies are to be fulfilled.

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AN ITALIAN E-LEARNING PROJECT (PERMANENT TRAINING SYSTEM ON LINE)

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Background

The programming of the European Social Fund for the period of 2000-2006, in-line with the guidelines of the Commission, recognises the strategic role of new technologies in improving access of human resources into the labor market.

In the '90s an e-Learning project called FaDol (financed by the European Social Fund in the previous programming period 1994-1999 and promoted by the Ministry of Labour) anticipated this need by presenting the first Italian system of continuous distance training aiming to improve the competences of the operators of the vocational training system.

The implementation of the new objectives underlined in the National Operative Program ESF 2000-2006 Ob.3, promoted by the Ministry of Labour and Social Policies and the recent reform processes taking place in the Italian VET and in the labour market systems, are the environment in which the project Permanent Training System on line takes place.

In order to implement this e-Learning project (Permanent Training System on line) successfully, it is fundamental to use of FaDol's experience as well as its critical aspects and its strengths.

The objectives

The general objective of the Permanent Training System on line, to be developed in the three year period 2005-2007, is to provide support to the reforms on the labour market and the Italian VET system through the supply of continuous training provided by Information Communication Technologies (ICT) for the qualification/requalification of human resources. The project also aims to facilitate a wider diffusion of the competences related to ICT.

The above mentioned general objective, including the development of the ICTs, and its applications in the training context, will be implemented through three actions: coverage, innovation and opening.

Extension of the target audience: the original target of FaDol (trainers of VET system) is widened to new targets. According to this perspective the users of this new service will include not only operators coming from Vocational Training system but also operators coming from labour market, employment services and so on. While the potential users of FaDol were about 17.000, it has been estimated that the potential users of the Permanent Training System on line is close to 400.000.

Innovation in the methodology and the training practices: the experience of FaDoL and the simultaneous achievement of the FaD methodologies required the improvement of the training supply, such as increasing the variety of the didactic tools, the interaction and the motivation to learn. The objective of innovation is also implemented through the articulation of training supply between the hours dedicated to training based on the "tutor aided self-learning" methodology (70%) and the hours dedicated to training with the use of the innovative methodology called "collaborative learning" (30%).

Opening of the system and transition towards e-learning: the opening of the service and the methodological innovation enables to overcome the obstacles of the previous FaD systems limited to a group of users and allows the transition towards an Internet system with the necessary safety and privacy measures. Using face-to-face training, together with distance training (Blended Learning) provides an input to pass to more advanced training systems.

The redefinition of the system has to meet not only efficacy but also efficiency criteria and cost/benefit optimization as well.

Structure

Technologically the Permanent Training System on line will be based on the use of internet, in order to promote a large access to its own services. Didactically, it will promote an active role of users by the development of individual learning with tutorship assistance and collaborative learning.

The planned structure of the Permanent Training System on line is articulated in the following working teams:

- *Coordinating and Control Team* coordinated by the Italian Ministry of Labour and Social Policies. It controls and coordinates the activities of the project through a narrow group of experts.
- *Strategic Steering Committee*, whose aim is to set the guidelines for the project Members of Committee are representatives of the Italian Ministry of Labour and Social Policies, Regions, Autonomous Provinces, Italia Lavoro (an Italian National Agency working in the field of Social Policies), the Italian Ministry of Education University and Research as well as social partners.
- *Central Technological Service*, coordinated by Italia Lavoro. It manages technological infrastructures as well as the assistance using the technological platform.
- *Training Contents Development Service*, coordinated by the Italian Ministry of Labour and Social Policies with ISFOL as Technical Assistance structure. Its task is to define training contents related to professional profiles/areas as well as the elaboration, editing and harmonizing the materials.
- *Multimedia Development Lab*, coordinated by ISFOL. The Lab's task is to convert storyboards into multimedia courses (CW).
- *Assistance to Learning Service*, assigned to ISFOL coordinates activities such as tutorship, guidance, skills analysis, needs analysis, didactical assistance, evaluation, certification, animation, and support to learning paths.
- *Training Monitoring System Service*, managed by ISFOL. This service is aiming to monitor weaknesses and strengths, in order to initiate corrective measures to optimise training efficacy on the Permanent Training System on line in a quality approach.

The Governance and Management of 'Permanent Training System on line'

The implementation of the 'Permanent Training System on line' project envisages an organisational strategy capable of optimising, in terms of effectiveness and efficiency, the project's impact on the training system and labour market.

This strategy is implemented through an organisational structure as follows:

Editorial and Guideline Committee

The Committee deals with the identification of training contents present in the Lines of Activity creating specific training services for the various segments of the Vocational Training and Labour Market system addressed by 'Permanent Training System on line'.

The Committee, set up within the Ministry of Labour, will be of an institutional nature and may avail itself of the scientific contribution of national and international experts.

Methodological Management of the Lines of Activity

This refers to the various organisational units that manage the training services intended as "Lines of Activity". Each Line of Activity is characterised by:

- The pool of users targeted by the training activity;
- The contents of the training to be provided (according to the 'Editorial Committee' above);
- The teaching methods to be used.

These Lines of Activity meet the objective of qualifying and/or re-qualifying the professional profiles identified within the framework of the various segments of the Vocational Training and Labour Market system addressed by 'Permanent Training System on line'.

Each Line of Activity guarantees the management of the training services through a variety of actions such as:

- Didactic design of the modular training pathways;
- Creation of the service components (support materials, development of methods, manuals, etc.);
- Delivery of training and tutoring services (personal and specialist tutoring, mentoring, coaching, etc.);
- Monitoring carried out within the framework of each Line of Activity and evaluation of learning.

Technical Assistance (TA) and Training Monitoring

During the management and implementation of the project, the Ministry of Labour and Social Policies will avail itself of the support of the two national TA agencies, i.e. ISFOL and Italia Lavoro.

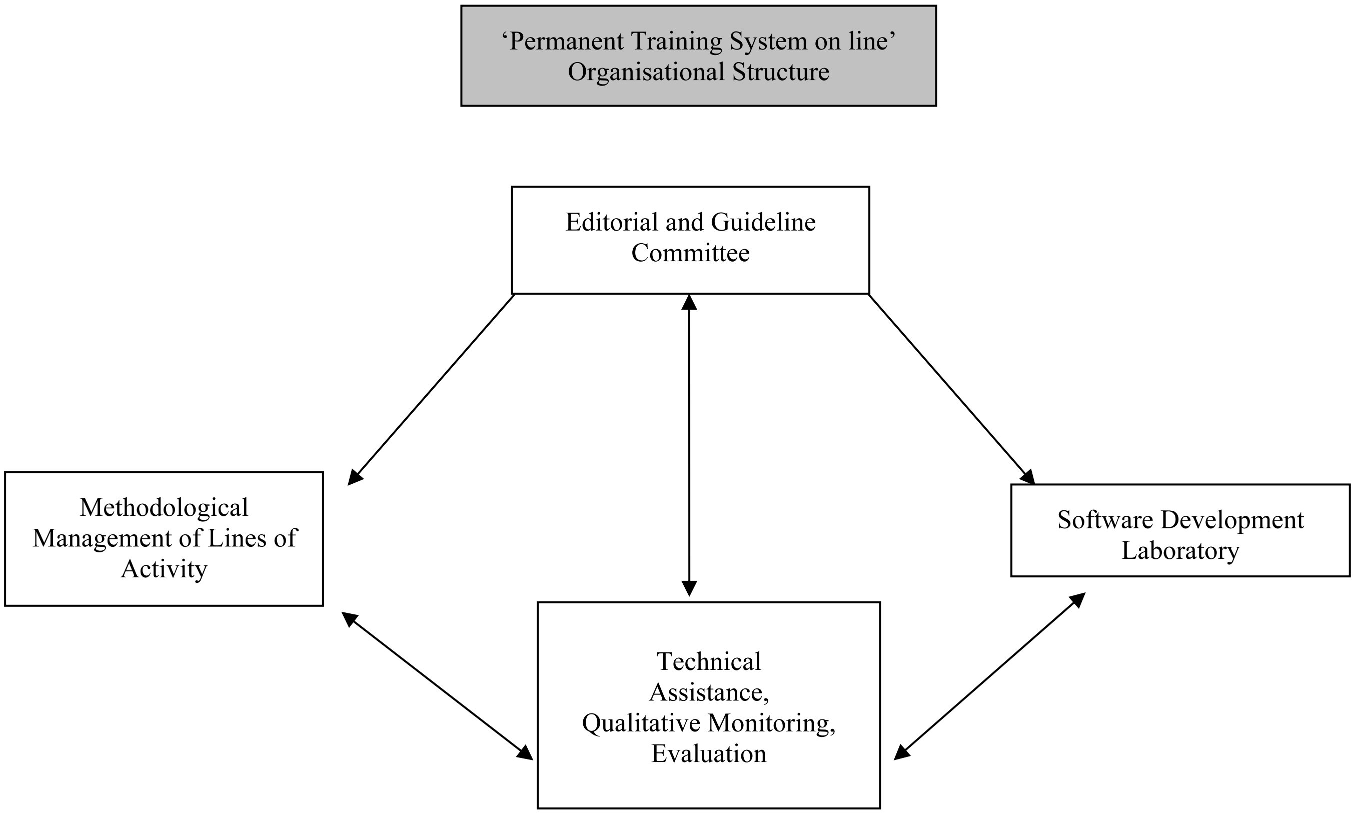
Following its decade-long experience of TA to the Ministry of Labour and Social Policies on training- and employment-policy matters, ISFOL will handle the development and implementation of the qualitative-monitoring and impact-assessment system on the basis of the data provided by each Line of Activity. For this purpose, it will develop a technical instrument defining the evaluation environments and dimensions, and the descriptors and variables according to which the various surveys will be conducted. The qualitative-monitoring system, which will concern all the Lines of Activity will also envisage thematic (by Line of Activity) and territorial (by Region) animation of actions aiming to encourage and receive possible suggestions for improving the project performance and for harmonising the training supplies.

The intermediate results of the monitoring action will be used to indicate the adjustments that will become necessary throughout the life-cycle of the Project.

As for Italia Lavoro, consistently with the tasks assigned to it by Law No. 448 of 28/12/2001, the activity of TA to the Ministry of Labour and Social Policies will be structured as a series of actions aimed to guarantee the technological management of the services.

Software Development Laboratory

The Software Development Laboratory collaborates with the 'Editorial Committee' and is responsible for producing and maintaining the training software applications that characterise the various Lines of Activity.


‘Permanent Training System on line’
Organisational Structure
Editorial and Guideline Committee
Methodological Management of Lines of Activity
Software Development Laboratory
Technical Assistance, Qualitative Monitoring, Evaluation

A COMPARATIVE ANALYSIS OF REGIONAL LIFELONG LEARNING: THE NEED TO USE ELEARNING FOR UPSKILLING WORKERS AND HOW SHOULD LLL BE LINKED TO REGIONAL PRODUCTIVITY AND INNOVATION

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1. Introduction

The ReLL project (*Regional Network to develop Lifelong Learning Strategies*) was one of the 17 projects that were approved in the frame of the R3L initiative of the EC (The "learning regions" or R3L initiative "Regional networks for Life-Long Learning": the promotion of the regional dimension in life-long learning throughout Europe). The url of the ReLL platform is: www.education-observatories.net/rell

ReLL builds on and aims to extend (in objectives and regional partnerships) an existing collaboration framework (through ADAPT and ADAPT bis) among Regional Administrations to develop a *transnational interregional collaboration Laboratory* between regional networks to assist and encourage the transnational exchange of know how in the design development and evaluation of Lifelong learning initiatives/approaches.

The ReLL partnership is formed by the following Regions:

- Bayern (Germany): FIM psychologie
- Athens (Greece): Lambrakis Research Foundation (Athens, Greece)
- Aandalusia (Spain): CEMER (Cordoba, Spain) and Direction General for Occupational Training of the Junta de Andalucía (Sevilla, Spain)
- Poitou-Charantes (France): Eiffel, European Institute for e-learning. (Paris, France) and Espace Mendès France
- Veneto (Italy): Industriali Veneto SIAV S.c.a.r.l and the Regione Veneto thorugh its Regional Secretariat for Training and Employment
- Trentino-Alto Adige (Italy): Provincia Autonoma Di Trento
- Yorkshire (UK): The MRS Consultancy Ltd. (Bedale, North Yorkshire, UK)
- Wales (UK): University of Wales. Aberystwyth. (WIN. Wales Information Network)
- Brasov (Romania): Politehnica University of Bucharest.

ReLL focuses on the role of Lifelong Learning (LLL) to support innovation policies at regional level that are aimed at a socially inclusive economic development. ReLL is essentially about:

- Creating a *Policy observatory on the role of Lifelong Learning (LLL) to support innovation policies* at regional level that are aimed at a socially inclusive economic development;
- Identifying and reviewing *indicative cases of LLL measures* from a socially inclusive regional economic development approach;
- Using the results of the case studies to develop tools to assess the outputs, outcomes and impacts of these types of measures.

2. Methodology

The methodology incorporated:

- The *analysis of the context: lifelong learning* as promoter of social and economic development within the Region;

- The *comparison of all the regional approaches* (comparison and analysis of regional reports and case study exemplars complemented by the regional round tables) towards LLL;
- The identification of the innovation trends at regional level.

The methodology consisted in *involving all partners in the comparative exercise* that lasted 19 months (from January 2002 to July 2004) which consisted in developing the following steps:

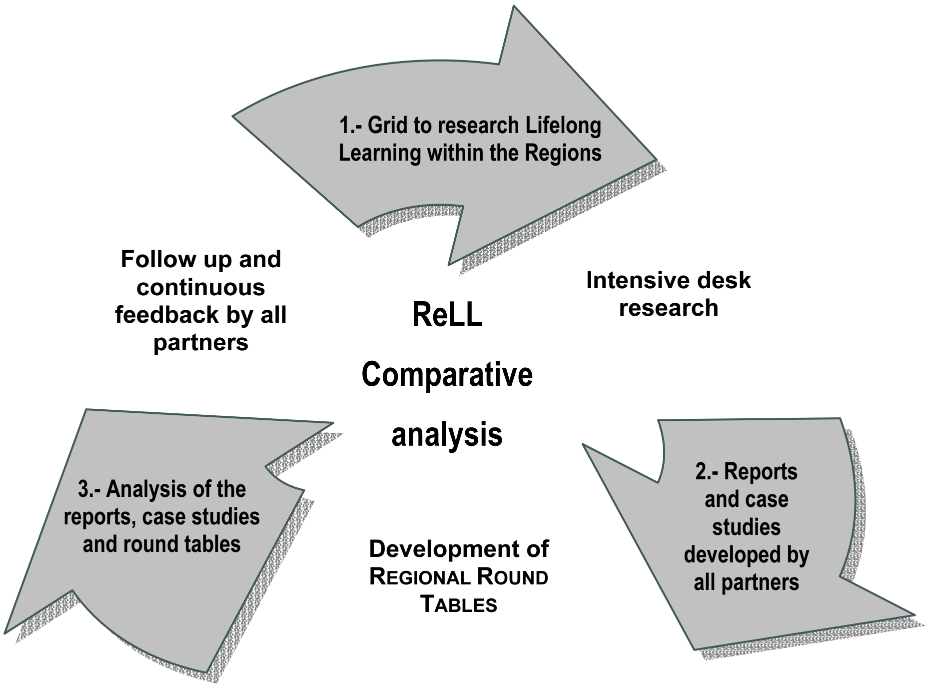
1. The first step consisted in issuing a grid to research the situation of Lifelong Learning in all the Regions. The regional report did include a mapping exercise to identify the main stakeholders within the region and explored the main initiatives which were studied more in-depth in the case studies. The innovation policy was researched making special emphasis on eLearning:

REGIONAL REPORT TABLE OF CONTENTS
1. Region "Identity card": Population, economic and Social characteristics, import/export, profile of innovation, other characterising element (e.g. Mountain, cultural heritage, tourisms…)
2. Regional Policy for Innovation (in general) and role assigned to Learning (education, training at all levels…) making special emphasis on eLearning
3. Specific innovation lines in E+T (with specific role assigned to Lifelong learning activities)
4. Lifelong learning approach (if any) developed and/or perceived as a need
5. Factors governing LLL approaches: Drivers and barriers both internal and external
6. Perceived priorities for the future

2. The *case studies* (1 or 2 per Region) were based on initiatives that have been implemented (whether successfully or less) at regional level. The main characteristics of the initiative did provide the necessary information to focus on Innovation: aims and impact obtained. That information did also provide some hints to determine the coherence, effectiveness and efficiency of the initiative together with the potential of transferability to other contexts and potential of sustainability. The *research* exercise was complemented by an intensive *desk research.*
3. Furthermore, as the project was reaching a greater level of maturity, a *focus groups approach* was developed to consultatively audit the regions. Each region developed a ***regional round table*** in which the main stakeholders were involved. This complemented the vision of Lifelong learning within the Regions.

   The general aim of the exercise carried out was *to find out the situation in each of the Regions involved in the project by organising a round table* that involved all the regional stakeholders already identified in the reports. Thus, *the results of the round tables complemented the work already carried out by the regional reports and case studies and did provide the necessary information for comparing the different approaches at regional level.*

The following graph summarises the cycle (design of research tools, desk research, development of regional reports and case studies, regional round tables, analysis of the information described for the development of the ReLL comparative analysis):



3. Results of the research

Lifelong Learning is a multidimensional concept in the making which would need further elaboration and analysis

- *Lifelong Learning* can be considered as a *set of integrated policy initiatives* designed *to facilitate a higher level of general education*; an increasing mix of employment-linked vocational training; the creation of bridging courses and accreditation arrangements between education and training provider systems, all situated within a more open and flexible 'lifelong learning' system. *This definition could be complemented with "informal learning",* as learning that adds value to personal and social development in addition to that generated by participation in formal learning.
- From the analysis we have carried out in the Regions involved in the ReLL project, we can see that *the concept of Lifelong Learning,* due to its complexity and implications, *needs further elaboration and analysis as the concept changes depending on the context and the policy priorities of each territory.* It can be understood as a *concept in the making.* And the use of the concept is not neutral. There is a discrepancy between the acceptance of the term in the political field (and not in all the Regions we have analysed) and the shortcomings of it in the scientific analysis.

The region has demonstrated to be a particular right setting in which LLL can demonstrate its potential to be a development engine

- The experiences analysed show that *some Regions* (Yorkshire and the Humber, Wales, …) are *developing significant initiatives encouraging top-down approaches in which many actors to co-ordinate their efforts according to a common region-wide strategy*. Thus, *the region as such has become the right setting in which innovative LLL strategies may be "organised" to favour regional social and economic development.*

LLL is generally embedded in broader policy areas (generally education and employment related) and its connection to innovation and "knowledge society" concepts and eLearning is growing

- Considering LLL as a dynamic concept, *most of the initiatives at regional level seem to be more and more frequently embedded in broader policy areas* (related to education, employment, productivity, inclusion…) and, in some cases (like for example, Andalusia), are linked to region-wide "knowledge society" initiatives in which *the promotion of ICT and eLearning is a key element.*
- LLL has also proved to be connected to the concept of innovation. From the initiatives analysed, we can assert that *when a specific LLL strategy is approached, its goal is always related with the development of competitiveness of the region and its actors.*
- Most of the regional experiences analysed show that *a complete coverage of potential target populations is not an easy achievement.* In most regions some classes of users (e.g. long-term unemployed, unskilled workers, etc.) have absolute priority while others are not considered as relevant or, at least, are not benefiting from special measures. It is to note, however, that *attracting new audiences has become a priority for some Regions* (i.e. Wales).

LLL measures mainly focus on coordination with other policy areas and systematic use of information and communication technologies (ICT) and eLearning for upskilling workers and connecting LLL to productivity and innovation

- In terms of concrete content of LLL initiatives, the *dominant trends consist of integrating and improve policy coordination within the Region and systematic use of information and communication technologies (ICT) and eLearning for upskilling workers and connecting LLL to productivity and innovation.*

Bottom up approaches and partnerships are crucial when speaking about Lifelong Learning

- The *importance of bottom-up dynamics* and all the stakeholders' involvement is recognised in all the Regions analysed. In some of the reports studied, the opportunity to build on successful experiences in which the *activation of resources additional to public learning services has proved to be a very effective way to multiply the energy that society is able to generate in view of promoting LLL and, to a further extent, regional development.*
- A balancing conclusion to the previous one is *the need to single out effective and transferable ways to promote LLL partnerships.*

There is a need to co-ordinate LLL initiatives and resources

- Co-ordination is a misleading keyword in LLL initiatives at regional level: in spite of the many declarations and honest attempts to co-ordinate and rationalise provision of learning at regional level, often the only significant result is co-ordination of information sources that are whether related to education or to employment*. Co-ordination of action is still a far objective, not necessarily desired by all relevant actors involved in policy making, some of which may have a central interest in guaranteeing continuity of target groups' fragmentation rather than co-ordination.*
- In most cases economic resources, as essential factor to guarantee feasibility and sustainability of LLL initiatives, *are available at regional level, but there is a need to rationalise and co-ordinate these resources among the different fields* indicated above (education, employment, knowledge society initiatives, etc.).

There is little evaluation carried out in most initiatives and lack of coherence among them as no system approach is adopted, increasing the risk of self-referentiality

- In most of the cases researched, *very little systematic evaluation was conducted* or, at least, the researchers were unable to refer to an already conducted serious evaluation exercise. The culture of evaluation is not missing but probably the following points can explain part of the disappointing findings in this area:

- Lack of useful and comprehensive indicators to carry out evaluation on LLL;
- Little/inexistent amount of resources devoted to it;
- Relative lack of a system approach to a series of originally independent initiatives.

- Owing to the lack of evidence on results, *external comparisons of results between regions are rare, and a strong risk of self-referentiality exists*.
- In spite of the many attempts to build coherence among a multitude of initiatives conducted at regional level, *the situation appears to be one in which many projects and initiatives keep being isolated, unknown outside their immediate context, sometimes duplicating other similar initiatives conducted in the same place by other agencies* (e.g. it often happens in education and employment initiatives). A general improvement in availability of information and some rationalisation in the provision of initiatives are, according to our survey, needed steps to build a system dimension around the many individual actions that can be observed in European regions.

Evaluation must rely on comprehensive indicators, both qualitative and quantitative, able to show a complex and changing reality

- As changes are likely to be evident and not always measurable in hard statistic terms, *the evaluation exercises adopted should set out a number of clear and accessible "benchmarks" able to provide standards to aspire to.*
- *Evaluation of LLL must aim to balance the quantitative indicators conventionally required for public accountability with qualitative indicators,* which are meaningful for the actors involved *trying to focus on emerging fields that have not been sufficiently explored in the traditional sets of LLL indicators to meet the challenges posed by the Knowledge Society.*

4. Next steps to be taken

ELdORADO proposal: European Learning Community for Regional Development, a MINERVA project submitted in the 2005 call

Existing literature on the implementation of e-Learning at regional level points out two basic elements to consider:

1. the *high potential of e-Learning* to accompany major projects and initiatives to *support regional* economic *e-* and social development, particularly towards achieving a "knowledge society"
2. and *the lack of actual integration of e-Learning,* policy and practice into the regional

The explanation of this gap between potential and reality could be based, amongst other reasons, on 3 main issues:

- The lack of familiarity of regional and local policy makers with e-Learning;
- The present fragmentation of responsibilities concerning Regional Development, and the relative isolation of education and training in the policy agenda;
- The *lack of e-Learning awareness and direct experience by responsibles and the professionals of Regional Development*.

ELdORADO mainly addresses the third aspect of the problem influencing the other 2 by proposing to *establish a European Learning Community for Regional Development responsibles and agents,* in order to address their main leanings needs (in terms of Continuing Professional Development rather than initial education and training) and familiarize them with e-Learning, as an approach that might be adopted to accompany the main RD programmes and initiatives. On one hand ELdORADO will help the main actors in regional development to learn and gain competences through e-learning and in this way e-learning itself will support, in an indirect way, the sustainable development of the Region.

The main goal of ELdORADO is to *establish a* user-friendly *European Learning Community for Regional Development responsibles and agents,* addressing their main leaning needs (in terms of Continuing Professional Development rather than initial education and training) and aiming at familiarizing them with e-Learning.

The main objectives of ELdORADO are:

- To *identify the learning demand* of Regional Development Agents (RDA) and responsibles across partner regions
- To *design a collaborative e-Learning system*
- To *launch and pilot two collaborative e-Learning initiatives*
- To *validate the model and plan its sustainable development*
- To *disseminate, sustain and build upon the lessons learnt*

The partnership is formed by institutions from 8 EU countries:

- FUEIB (ES), The University-Enterprise Foundation of the Illes Balears as promoter and coordinator
- FIM New Learning – University Erlangen-Nuremberg (DE)
- Red Fue – Network of Spanish University-Enterprise Foundations (ES)
- Scienter España (ES)
- EIfEL – European institute for eLearning (FR)
- ALMAWEB (IT)
- BME – Budapest University of Technology and Economics (HU)
- TKK Dipoli – Lifelong Learning Institute (FI)
- Tavistock Institute (UK)
- Norwegian Association For Distance Education – NADE (NO)

ELdORADO mainly addresses the *Regional Development Responsibles and Agents,* which will be trained through a collaborative learning approach. It will also imply the active involvement of the *research community* and will aim at *influencing the regional and local policy makers.*

Its activities are organized in 5 Work packages, namely: 1. *Regional Development Co-Laboratory;* 2. *Collaborative learning implementation;* 3. *Learning Community for Regional Development;* 4. *Feedback and sustainability* and 5. *Project management and evaluation,* and its main *outcomes* include:

- Map of main regional development priorities, learning supply and related learning needs in a transnational cooperation environment
- Activation of a collaborative learning environment and learning resources
- Two learning initiatives related to Regional development tested and running
- Sustainability plan developed
- Coordination and quality management implemented.

E-LEARNING AND IMPLEMENTATION OF INFORMATION COMMUNICATION TECHNOLOGIES IN LITHUANIAN VOCATIONAL TRAINING SYSTEM

Antanas Vidziunas, Arturas Mickus, Vida Zviniene, Vytautas Magnus University, Lithuania

Abstract

In the light of technological, economic and social changes, the problems of overall occupation of people and continuous growth of economy become more important and complex. It is universally accepted that continuous development of people's knowledge and skills, investment in education and vocational training are the main factors stimulating the economical and social development of the state. This paper analysis the situation of implementation of e-learning in vocational training system, the organizational and financial problems of e-learning and their solving methods.

1. Introduction

The constitutions of most European countries emphasize the right of all their citizens to learning and good professional training. This right also is declared both in European Union's Charter of Fundamental Rights, 2000 and in other EU documents [1, 2, 3, 4]. The main problem in the implementation of this right is the need of continuous upgrading of knowledge. Therefore, Memorandum on Lifelong Learning is announced in the EU, where learning, e-learning and information communication technologies (ICT) are recognized as the main tools of such learning.

Active implementation of e-learning in higher education, vocational training systems has to be a key part of both development of Lithuanian educational system, and adaptation of all the economy to the needs of knowledge economy and information society [5, 6, 7]. Therefore, the development of LieDM network will help to reach general strategic objectives of Lithuanian development – to provide the equal possibilities for all the citizens to use and to develop their abilities, to get a good education which satisfies needs of society and to get the job witch fits to such education.

The problem. In order to ensure quality of lifelong learning and services of labour market, accessibility of education and vocational training services to all Lithuanian citizens, to modernize learning environment and to improve the infrastructure of educational system, it is necessary to increase the ICT possibilities in the areas of education, vocational training, science and higher education.

The objectives and methods. To overview the implementation of e-learning in Lithuanian vocational training system, to find out the main problems of this implementation and to suggest their solving methods.

2. Relation Between Employment Level and Education

The demand of higher education and vocational training is always closely related with employment situation and unemployment level. Restructuring of economic, privatisation processes and economic depression during the first year of independence of Lithuania caused high unemployment rate, especially among young people. For instance, in 2001 general and youth unemployment rates were highest among Baltic States and amounted respectively 16.5% and 30.9%. While in the EU these rates were two times less and amounted respectively 7.4% and 14.9%. According to the data of Department of Statistics to the Government of the Republic of Lithuania (Table 1), people with lower qualification constitute the major part of the unemployed. About 4/5 of the registered on the labour exchange unemployed are unqualified or their qualification does not suit the demand of current labour market.

About half of the registered young unemployed are unqualified. It indicates a very important social problem, because in most of well-developed countries the demand on unqualified work is fewer than 20% and has tendency towards reduction.

Table 1: The rates of employment (ER), unemployment (UR) and activity (AR) by education, 2001 (Source: *Employment in Europe 2002 – Recent trends and prospects; Labour market, employment and unemployment 1998-2001 (research data). Department of Statistics to the Government of the Republic of Lithuania*)

Education level	**Total, %**		**ER, %**		**UR, %**		**AR, %**	
	LT	**EU**	**LT**	**EU**	**LT**	**EU**	**LT**	**EU**
High skilled [1]	32.3	18.9	72.7	82.6	10.6	4.5	81.3	86.7
Medium skilled [2]	30.9	42.6	55.9	70.2	21.9	7.2	71.6	75.7
Low skilled [3]	35.8	38.5	20.8	49.0	22.6	10.8	27.3	55.0

[1] Tertiary education completed;
[2] Upper secondary completed;
[3] Less than upper secondary completed.

Particularly high unemployment level is among young people of age 15-19. It reaches 31% despite the fact that 85% of them studied in general secondary schools (Source: Key indicators on VET: Central and Eastern Europe. 2002). Key factors that determinate such high unemployment level are:

- After leaving general secondary schools and without vocational skills and enrolment to higher schools, young people become unemployed;
- In Lithuania a high percentage of wastage exists in general education period.

Frequently education system is left before acquiring basic school education. For instance pupils who have acquired basic school education as compared to number of young people of age 15 amounted only 80% in 1992, and 73,7% in 2000.

The integration possibilities for this not inconsiderable part of young people into labour market are rather limited. Long-term unemployed people accounted 46% of all the unemployed in 2000. While this rate in the EU reached 31,9% and has tendency towards reduction. The increase of youth unemployment indicates very important social problems. Differentiation of society and insufficient financing of education are one of the reasons of such situation. Active implementation of e-learning technologies using ICT in higher education and vocational training stages would contribute to the problem solving. This would create better conditions to choose appropriate learning programs and to use services of education institutions not only for youth but also for everyone who needs re-qualification or qualification upgrading.

The competition and the requirements for qualification of employees are increasing; a lot of specialists with higher qualification are leaving for other EU countries. According to the forecast of Department of Statistics to the Government of the Republic of Lithuania, about 150 000 specialists with higher qualification will leave Lithuania during next 2-3 years.

3. Tendencies in Lithuanian Education System

Education is a main tool for development of "human resources", competitive ability of the country, employment and social stability. It should be open and high quality and oriented towards developing and upgrading of human abilities.

According to the last data of the EU Statistical Office "Eurostat", Lithuania is in the EU top five by number of educated citizens. In 2002 in Lithuania 85% of citizens of age 25-64 had not lower than secondary education. Lithuania was the fifth among European countries by this rate (the average in EU is 65%).

Despite of high percentage of wastage in general education period, the tendency is towards increasing the number of Lithuanian youth which are studying. In the last year 82% of young people of age 7-24 were studying and every third young people of age 19-24 tired for higher education. Last autumn 69% of secondary-school graduates became students of colleges and universities. Currently there are 19 universities and 24 colleges with 119 500 students put together (in full-time and part-time studies) (Table 2). It accounted 15% of total number of learners (810.4 thousands of young people). In the EU more than 12 millions students are studying in higher schools. It amounts 15% of total number of students and pupils of in education system. In the EU and EFTA/EEA public higher schools, the high percent in comparison with total number of learners is in Greece and Spain (18%), Finland (19%), Italy and Norway (17%). In new EU members this rate is 10% on the average.

Table 2: Number of educational institutions and their learners

	Number of institutions	**Number of full-time students**	**Number of evening and part-time students**	**Total number of students**
Universities	19 (4 of them are private)	77 800	41 700	119 500
Colleges	24 (9 of them are private)	13 672	12 538	26 210
Vocational training schools	86	-	-	44 260

In Lithuania professional education is provided and improved in professional training institutions (professional training schools, professional training centres, courses and specialized professional training institutions) and enterprises as well as in colleges. Vocational training is also related with general education. Pupils with basic and general secondary school education are enrolled in vocational training schools. The professional training is regulated by the law of vocational training of the Republic of Lithuania. Vocational training schools provide not only professional qualification, but also general education. In the school year 2003/04 in Lithuania there were 86 vocational training schools with more than 44 000 students and that amounted about 6% of total number of learners. Recently there is a tendency towards reduction of number of students in vocational training schools. Firstly, it is caused by demographical problems of the country. Secondly, the vocational training and schools of the state are being reorganized and some of the schools are eliminated or unified and colleges are being created on their basis. And finally, more learners are self-motivated to relate their future and future career with higher education.

According to the data of Department of Statistics to the Government of the Republic of Lithuania, very few adults are studying. In the last year the rate of adults participating in various courses and seminars amounted only 4.5% and was lower not only than the average in European countries, but also than in neighbouring countries such as Latvia (8.1%) and Estonia (9.6%). It is caused by a lot of material, juridical aspects and the capacities of educational system itself:

- Professional training is not enough open for everybody who wants and is able to study, especially in the rural regions and for people with low finances;
- The capacities of educational system: there are not enough human and financial resources in order to ensure the high quality lifelong learning and to respond structural changes of economy;
- Adequacy of higher education, vocational training and needs of economy is insufficient;
- Legal basis practically does not regulate and motivate the training of working people.

4. E-learning in Vocational Training Schools

In Lithuania the services of e-learning are provided by Lithuanian Distance Education Network (LieDM). LieDM network is founded in consonance with program “Information Technologies for Education and Training (2001-2006)” (further termed as ITMiS) supported by the dictate of Education Minister No 115 for the date of January 30, 2001. The goal of LieDM is to generate and coordinate higher education studies and continuous training system based on ICT.

LieDM network is being created on the base of Academic and Research Network of Lithuania LITNET. Currently LieDM network consists of 3 distance education centres, 5 videoconference mini studios and 16 distance education classrooms. The network is most developed in higher education institutions. 3 distance education centres, 4 mini studios and 7 distance education classrooms were established in 7 from 15 (47%) state universities and 1 scientific institute. 5 distance education classrooms and 1 mini studio were established in more than one third of state colleges (in 6 from 15). The LieDM network is least developed in vocational training system. *Only in 4 from 86 vocational schools 4 distance education classrooms were established.*

5. Supply of Vocational Schools with Computers and Software

As it was mentioned above, 44 260 pupils study in 87 vocational schools (Table 3). Total number of computers is 3 452 (Table 3). So, the ratio is: approximately 1 computer for 13 pupils. Almost the same proportion is in 9-12 forms at schools and gymnasiums. Unfortunately this proportion fulfils the needs only of these specialities where only general competencies of computer literacy are needed.

Table 3: The number of pupils and computers in government-funded vocational schools

Number of schools	**Number of pupils**	**Number of computers**	**Proportion of pupils and computers**
87	44 260	3 452	12.82

In system of vocational training most of computers do not have insufficient technical characteristics (see Table 4): 52% of all computers have 300 MHz or better processors, all schools have access to Internet, but only 33% of them have high-speed Internet access.

Table 4: The technical parameters of computers in vocational schools

Number of computers with less than 300 MHz processors	**Number of computers with 300MHz or better processors**	**Number of computers with local area connection**	**Number of computers with Internet connection**	**Number of computers with high-speed internet access**	**Number of schools with Internet access**	**Number of schools with high-speed internet access**
1 655	1 797	2 747	2 656	1 153	87	50

Expenditure on learning programs accounts for about 8% of total expenditure on ICT implementation at vocational schools. Such small percent is justifiable only at the initial stage of ICT implementation when the main objective is to develop the basics of computer literacy.

6. Professional Competence of E-learning Specialists and its Upgrading

Usually, 2-3 specialists work in one distance education classroom of vocational training school. The functions of these employees usually are administration and technical maintenance of Classrooms. Therefore, there are no human and financial resources for designing e-learning courses, projects and organizing learning seminars. That is the reason of such a low number of e-learning courses prepared in vocational training system. Experience of west countries shows, that from 10 to15 various IT specialists (OS, databases, programmers, web-designers) work in one course designing group. Also action groups of managers are involved.

It is important to note that most of e-learning specialists have higher education. Specialists of information technologies (educators and engineers of informatics) and retrained specialists of other subjects (physics, mathematics, engineers and etc) teach e-learning technologies.

Because of the rapid development of e-learning technologies, the specialists of this field have to upgrade their knowledge each 4-5 year. Special attention should be drawn to learning seminars and courses for lectures and teachers of various subjects. They should be introduced how to use e-learning technologies in learning process, how to manage virtual learning environments and modelling programs. LieDM network organizes such training from 2001.

Budget for the upgrading teachers' qualification accounts 4-7% of total budget for ICT implementation in education. While in the USA, the EU it varies from 20 to 40% of total budget [4]. In Greece this percent reaches 60%. In the context of the budget for the development of human recourses Lithuania together with Bulgaria and Cyprus goes in the last place. According to the experience of developed countries it could be stated that the budget for upgrading qualification of teachers have to account 30% of total budget for ICT implementation in education.

7. Financing

In all European countries the vocational training programs are financed from the state budget and private capital. However, ICT implementation always has a priority. In Lithuania the systematic ICT implementation began in 1986. The long-term strategy for such implementation is described in the Strategy for ICT Implementation in Lithuanian Education documented in the year 2000, and the detailed plan of implementation of defined goals in comprehensive schools is described in the Programme of ICT Implementation in Educational System prepared in the year 2002 [6]. The documents of the programme show that expenditure on hardware and Internet equipment accounts for 69% of total expenditure, on systemic and general purpose software 17% and remaining 14% on development of ICT competencies and upgrading qualification and other questions.

According to that programme for purchasing hardware and software state budget gives only about 30% of required funding. Remaining funding have to come from private sector, European funds and other programmes (PHARE, SOCRATES, LEONARDO DA VINCI and etc.).

Business and industry organizations usually give direct support for particular initiatives of schools in their regions: used computers, other equipment and funding for one purchasing are given to schools. But such support is episodic, because contemporary tax system does not motivate enterprisers to participate in vocational training.

8. Conclusions

1. Solving the problem of unemployment, it is necessary to use the experience of the EU in development of formal, non-formal, continuing, vocational training, lifelong learning and implementation of modern e-learning technologies in education.
2. Education ensures development of knowledge society and knowledge-based economy. Therefore, it is necessary to develop open and flexible e-learning system that ensures lifelong learning.
3. Not only computer literacy courses but courses of e-learning technologies and practical usage in the teaching process should also be organized for all teachers of system of vocational training. In order to ensure high quality services in Lithuanian vocational training system it is necessary to considerably increase financing for development of human resources in this field.

4. In order to ensure equal development of all regions of Lithuania, it is necessary to develop the e-learning network of vocational schools. The representatives of local government should find a funding for establishing e-learning classrooms.
5. In order to expand a learning market, closer collaboration with representatives of business and industry in delivering continuous vocational training programs is necessary.

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TEACHING THE TEACHERS: A GUIDE TO E-PEDAGOGY IN THE CONTEXT OF ADULT EDUCATION

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Teaching the teachers: A guide to e-pedagogy in the context of adult education

This paper examines how the practice of module development and delivery itself generates skills in students (who are themselves teachers), which can be put to use in their own teaching; how the work-based learning and vocational aspects of a UK Foundation Degree (Computing and Management Sciences (FdSc)) for Adult Education (AE) tutors, curriculum developers, and ICT support staff, creates a context in which the "teacher" is simultaneously acquiring specific e-learning and online tutoring skills relevant to their job, whilst also undertaking higher qualifications which contribute directly to their career development. It explores the dual roles of the online tutor, and the classroom tutor, alongside how the practise of dual delivery is integrated into one programme of study. The paper also discusses how the practise of dual delivery provides one way in which the logistical problems of adult students, returning to learning, and living in rural areas, might be overcome.

In this paper, I propose a framework for evaluation of accumulating evidence derived from current development and delivery of UK Foundation Degrees to part-time, mature students who are themselves Further Education (FE)/ Adult Education (AE) teachers, to geographically dispersed, rural areas of South-West England. A future paper will use as its statistical sample, the self assessment and student evaluation data returned by current Cornwall Adult Education Services (CAES) students. These will be analysed to determine the students' reasons for undertaking the FdSc, as well as locating the pilot Cornwall group within the wider context of adult education provision in the UK, and the need for FE and AE tutors to acquire e-learning skills in order to propagate online and e-learning opportunities to their own classes (predominantly those which offer vocational qualifications to the unemployed, those threatened with redundancy, and those from Small/Medium Enterprises (SMEs) who have no opportunities for entry into full-time Further (FE) or Higher (HE) education).

How module development and module delivery generate skills in students who are also teachers

By studying for the Open and Distance Learning (ODL) FdSc, students are experiencing the integration of online and face-to-face teaching, and are learning to attach appropriate learning activities to particular modes of delivery. Learning materials are developed and structured in ways that recognise the episodic and infrequent opportunities that part-time AE teachers have for their own personal development studies. Delivery of the FdSc programme also addresses the limitations of self-directed study at a distance by binding learning materials more closely to scheduled, albeit asynchronous, online activities – individual and team based. We hope, thereby, to nurture a recognition in the AE teacher, of both the power and the limitations of delivery at a distance and the importance of the separation between coverage of syllabus content and support for the learner. For example, HE Level 0 modules of the FdSc do not merely contain preliminaries for advanced study of computing and management sciences. They direct the learner to review essential transferable skills in team working, time management, and presentation of learning outcomes, tailored to the online environments in which they, as teachers, may be called upon to work in the future. Each syllabus topic has both a formative, content specific requirement alongside generic skills requirements that contribute to the assessed components of the foundation degree.

How work-based learning/vocational aspects of the degree create the context where the student who is also a teacher, acquires online tutoring skills

Work-based learning is a requirement of foundation degrees in the UK. Relatively uniquely in this instance, the work-based learning undertaken by the AE teachers as learners will be related directly to their teaching or support for teaching in the AE context.

Here it is important to reinforce the distinction between "work-based" and "work-located" learning. In other ODL programmes at Queen Mary, University of London, for example, the Honours ODL BSc (joint with British Telecom) students undertake "work-located" learning by agreement with the company and their local line management. It is often difficult, however, for the learner to apply skills and understanding emerging from their studies, if these are remote from the context of their day-to-day work. For the BSc students, this requires a separate and somewhat ad hoc arrangement with their business unit. By contrast, the foundation degree with the AES providers affords an ideal opportunity to embed "work-based" rather than work-located learning since the practise of study itself maybe applied to the legitimate work context of the AE teacher.

Structured opportunities for work-based learning in this latter sense derive from the ODL policy of enabling FdSc students to select from and refine small-scale, work-related tasks the refinement of which is negotiated with their employer and applied immediately to their teaching, or teaching support context. In this way, acquired ski9lls are put to use immediately – within the context of their open learning modules – not separated out into a "work-related project" or report. To achieve this, a list of work-based tasks that contribute to formative assessment for the foundation degree may include such tasks as redesign of existing course materials for delivery to adult learners in online environments. Outputs from these assessed materials will include, lesson plans, evaluation of student support requirements and technical considerations of proper separation between content delivery and learner support for future AE classes run by an AE service provider. In this respect, the assessed components for the FdSc includes both acquired skill (in relation to online tutoring practice) and understanding of the self directed adult learners' needs.

Dual delivery roles in one programme of study

This section outlines the pedagogic practice and guidance which is written into ODL Tutor Guides. It draws upon previously published work on e-pedagogy, (Whaymand, 2004), for delivery of e-learning[1] degree programmes. At the ODL unit, QMUL, we work hard at linking online tutoring with classroom tutoring – a pedagogic practice which forms the basis for our overseas delivery, teaching model. We are using the same model for UK delivery of the FdSc, and intend that the developing expertise of the local tutors working for AES, and studying with the ODL Unit, be communicated to their students. They will be able to use ODL online tutoring skills in their own teaching practice, and thus take part in the dissemination of best practice – via the teachers themselves! In a workplace environment where there is little time, and even less budget available for professional development of teaching staff, this has the potential to combine staff development with wider dissemination of best practice in e-learning.

All ODL BSc and FdSc students study part-time, whilst employed either full or part-time at work. They are often parents, managing study alongside work, running a home, and bringing up a family. Some FdSc students are from very dispersed rural communities, and cannot, therefore, take part in weekly classes at their Adult Education Centres. We recognise that a different method of teaching, underpinned by a different pedagogic practise, is required for students to succeed in, and be satisfied with, their studies. By definition, students will need to be independent, relatively autonomous learners, working with content materials and exercises that are student centred, and requiring little daily intervention by the 'traditional' academic lecturer.

Why do we believe online delivery, as a pedagogic practice, to be more student-centred than face-to-face delivery? We recognise the part-time students' need to compartmentalise their learning – to engage in

[1] Whaymand, M., Is Open and Distance Learning the Taylorism of the Twenty-First Century? The Changing Role of Academics in Open and Distance Learning Contexts? Proceedings of Eden Conference, Oldenburg, Germany, March 2004.

episodes of learning, and require our content authors and instructional design team to provide appropriate online activities/exercises. By fitting the appropriate activities to our online delivery, we make it more student centred; control is devolved more to the learner in relation to what is studied and when. By contrast, learner support and management of students, online, is more centrally managed and governed – reflecting the risks of disorientation and learner isolation from which open learning programmes typically suffer.

An example of this separation of autonomous (learner-driven) activity from centrally managed learner support is the manner in which formative assessment for an introductory programming course is structured as a sequence of exercises, undertaken by the learner at their own pace – but the successful completion of which, in stages, gradually increases the course grade the learner can obtain. Students need to complete these exercises before the end of the semester, but within certain limits, they are completed at the students' own pace. This type of activity and the freedom of completing it at the learners' pace, is built into ODL modules because "widening participation" students have particular needs. The "one size fits all" approach of traditional academic delivery in the lecture theatre and programming laboratory does not work for the adult, part-time, lifelong learner. Such learners do not generally have traditional academic qualifications; nor well-established academic skills; therefore, they need the flexibility of studying at a pace that can accommodate their having to give attention to their work, partners, children, home, support for dependent family members.

There is more opportunity for flexibility if we blend episodes of learning for our part-time student population through interleaving of classroom instructor-lead sessions, with online, self-directed sessions by dual mode delivery rather than single. In the delivery of traditional lectures, there is only time for the delivery of the syllabus, and little if any time at all for individual problem solving, and discursive, exploratory learning. Similarly, the well-known difficulties in securing and maintaining student motivation and self-direction in single mode distance learning argues for exploiting the benefits of dual mode delivery deriving from merging the benefits of both.

At QMUL, we subdivide the preparation of content and preparation of delivery materials away from delivery itself (using asynchronous, largely problem-based team and individual activities). We split the lead tutor away from managing discussion fora and individual student support, to focus primarily upon both appropriate authoring and delivery of content in part-time mode. When our mentors (learner support staff) report that there are not enough exercises/activities, we use the lead tutors' time to prepare new examples/problem sets/illustrations tailored to the specific needs of the class. We leave the question of how to distribute these to the module development teams; and we use teaching assistants to monitor online discussion forums, and to engage with students on a daily basis.

ODL integration of online delivery with face-to-face sessions

Pedagogic principle means that a programme curriculum, even if misguided, has to fulfil certain requirements. The means by which, even in the absence of face to face contact between the classroom and online tutors, the classroom tutor negotiates agreement, with the online tutor (who has the lead role in directing a course module) is established and confirmed before classroom delivery begins – then re-inforced by regular monitoring of online and classroom activities. This re-inforces for the learner what is expected of them both formatively and summatively and minimises the disorientation many online-only learners experience. (Badly taught courses typically fail when the learner has little or no conception of what is expected of them.) These are the pedagogic principles ODL follows in the framework for delivery of foundation degrees.

How, in this framework, is this essential governance of differing pedagogies of the classroom and the online environment to be secured? In ODL, we believe we can secure this through a careful separation of teaching roles that will subsequently be reflected in the teaching practise of our CAES learners. The management of this separation is as set out in the following:

Tutor Packs

In order that online and classroom delivery is coordinated, Tutor Packs are provided to all AES classroom tutors assisting in module delivery. They are prepared by the module delivery team extracting the relevant information from online content materials, and are distributed before the semester begins. Tutor packs typically contain: an overview of the module syllabus, and learning aims; a summary of learning objectives, and syllabus topics broken down into sections and sub-sections; lists of discussion activities, practical exercises, sample questions, with some model solutions, suggestions for further readings and textbook references; a blank Tutor Report Form (TRF) and Lesson Plan proforma (see below) – together with space for classroom tutors to record their own notes and supplements to the learning materials. Student Workbooks are provided to all AES students. They contain everything that is in the Tutor Packs, except, of course, the answers to exercises and activities!

Lesson Plan

In addition to the Tutor Pack, the delivery of the online and face-to-face tutors is further integrated by a Lesson Plan. As soon as the AES tutor has read through the Tutor Pack, they are required to write a Lesson Plan for delivery of the classroom sessions, linking online content with their face-to-face delivery. This will need to be agreed by the ODL tutor before the start of the module, in case adjustments are required. The Lesson Plan details, on a weekly basis, the breakdown of topics of study for the module.

Tutor Report Form

Once the QMUL tutor receives the Lesson Plan, they are able to see where major syllabus topics start, and are completed. They then note where in the 6-week delivery period, they should receive Tutor Report Forms (TRF) from the AES tutor. At the end of each major syllabus topic, the QMUL tutor receives a TRF, from the AEC tutor, giving feedback on how students have dealt with course material and delivery, and indicating where changes might be beneficial. This information is extracted from students' Learning Development Proformas, completed at the end of each major syllabus topic. The QMUL tutor notes any requests for change, sends a copy of the TRF to the ODL Programme Manager, and it is incorporated into post-semester review meetings, so that appropriate action is taken, and reported to quality assurance assessors.

Online Synchronous Sessions

Dual delivery is further integrated by the practise of Online Synchronous Sessions that are held during the period immediately before submission of Coursework. These take place at a pre-arranged venue, date and time, and comprise a one-hour "question and answer" session – based on pre-set exercises distributed by the QMUL tutor. Students interact with the QMUL tutor using "live chat" and conferencing software. The AES tutor helps students prepare for questions from the QMUL tutor.

How dual delivery will help overcome the logistical problems of rural students?

Currently, all ODL students of the FdSc Computing and Mathematical Sciences are employees of Cornwall Adult Education Services (CAES), with their roles ranging from tutors and teaching support staff, to administrators. They come from backgrounds in which "return to learning" is their main area of work, and recognise that a more significant use of e-learning delivery is essential to "widening participation" or "return to learning" students. These types of learners, in a geographically dispersed and rural region of south-west England, and the intermittent, mobile, diffused context in which their learning has to take place, demand the greater efficiencies and an ease of access that e-learning provides.

The practise of dual delivery in the teaching of rural students who cannot attend face-to-face classes on a regular basis, will ease the problem of access to materials, and teachers, by providing all required materials online, together with regular online access to tutor/teaching assistant support. Instead of having to attend regular weekly sessions at the AES centre, they can study online asynchronously, at their own pace, and in their own time, with regular attention given by their online tutor; they can also engage synchronously at scheduled, online sessions with their tutor, using conferencing software. They need, therefore, to attend face-to-face sessions with their local tutor on a less frequent basis. This may involve the tutor coming to their home rather than the learner travelling to formal sessions at a remote Adult Education centre.

The County of Cornwall, adjacent to the comparatively wealthy County of Devon in the UK, is a very large geographical region, served by a number of separate centres for adult and further education (Bodmin, Camelford and Wadebridge; Newquay; Caradon; Falmouth & Penryn; Helston & the Lizard; Bude and Launceston) but with no university provision at all. They serve a population of circa 499,114. The Cornwall AES is a major recipient of EU Objective I (ESF) funding, and is putting this money to use in engaging its under-skilled / under-employed population in lifelong learning opportunities, partly delivered through the Cornwall AES initiatives. Fewer than 10 employers in Cornwall have more than a thousand employees (see: Regional Development Agency report to Learning and Skills Council for Cornwall, Sept 2004).

CAES teachers are engaged in major projects to upgrade skills in this EU Objective one funded area. During their studies for the FdSc, the teachers themselves will be able to use their experience of dual mode delivery to enhance theirown teaching. Having had the experience and benefit of face-to-face delivery combined with the efficiency and ease of access that online tutoring is able to provide, they will be able to use the skills they have acquired to provide and improve the learning experience of geographically dispersed learners.

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TIEVIE – NATIONWIDE TRAINING IN EDUCATIONAL ICT USE FOR UNIVERSITY STAFF

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Introduction

One of the aims in the Finnish educational and information society policy is that 75% of the in-service teachers should be skilled in educational ICT (information and communication technology) use by the year 2007. One of the means to support universities to reach this goal is the national TieVie training programme.

TieVie is a nationwide support service project of the Finnish Virtual University providing training in educational ICT use. TieVie provides a training package of 5 credits (one Finnish credit requires an average input of 40 hours of work by the student), which is aimed to the teachers teaching graduate and postgraduate students. The aim of this training is to promote the use of ICTs in university teaching by helping teachers to apply ICTs in their own teaching in a pedagogically sound manner. The project also offers an expert training package of 10 credits. This training package involves the training of educational ICT trainers, IT support persons, experts and proficient users for universities and their virtual university projects. The project is funded by the Ministry of Education and the training is free of charge. The training is intended for all teachers and other staff members in all Finnish universities, with participants from all the 21 universities in Finland.

Network co-operation

TieVie training is provided by a network of five universities. The network includes the University of Oulu, the University of Helsinki, the University of Jyväskylä, the Helsinki University of Technology and the University of Turku. The project is coordinated by the University of Oulu. The members of the TieVie planning group design the training packages, and organise and provide the training themselves. External experts are also used as trainers and tutors in the training. The TieVie project has also hired 26 mentors for the Finnish universities with university funding, and they have been in charge of tutoring the local groups and supporting the participants' development projects. A group of some 150 experts in all have taken part in the provision of the training annually. The co-operation and practical sharing of expertise among universities serve to ensure the quality, efficiency and effectiveness of the training.

The TieVie network started providing training in 2001. The marketing of training programmes and the selection of participants has been carried out by 21 TieVie contact persons recruited by the universities. During the first four years of operation (2001-2004), some 940 participants in all have taken part in TieVie training: 600 university teachers have participated in the 5-credit TieVie training, while approximately 340 university staff members have participated in the 10-credit TieVie expert training. The completion rate (average 72,3%) in both trainings has been excellent in view of the large number of participants and the duration of the training.

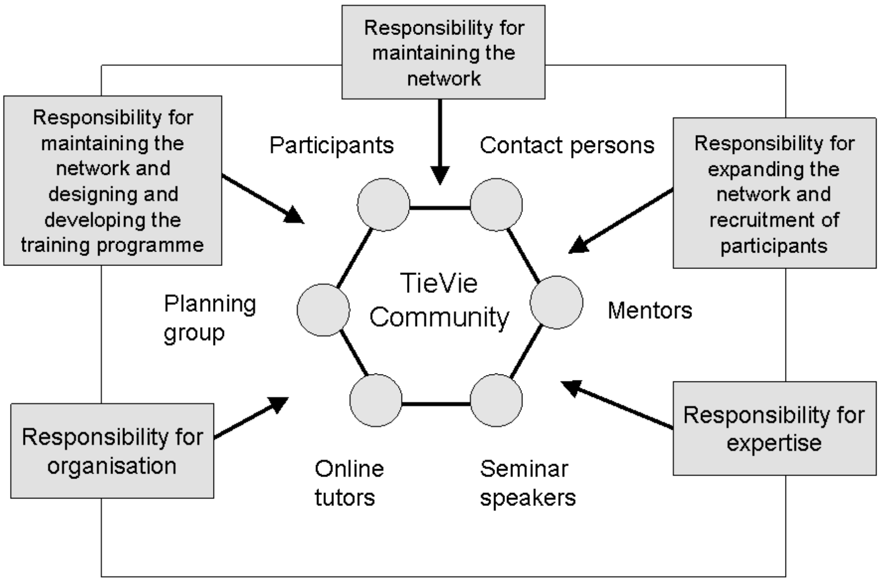

Figure 1. Parties contributing to the TieVie community and some areas of responsibility in the project

Description of the training programmes

Both the TieVie training (5 credits) and the TieVie expert training (10 credits) are built on contact seminars, online learning, work in different kinds of groups, literature, and independent technology workshops. The contact seminars are intensive two-day sessions with keynote presentations, case descriptions on educational ICT use, and work in small groups. During the online periods the participants work collaboratively in different ways, acquaint themselves with the online materials and carry out a variety of learning tasks. The duration of the online periods varies from one week to two months.

The working methods in the training have been constructed to allow problems in the educational use of ICT to be solved together in an expert community formed by the participants, mentors and trainers in open atmosphere. The participants obtain personal experience in online studies as well as a concrete opportunity to network with other universities and teachers in different branches of science. The goal in this training is not to add to the amount of distance education, but to support networking and to improve and diversify the quality of university teaching and to educate trainers and support staff for the educational use of ICT.

In TieVie training, goal-oriented activities are guided by pedagogical and functional principles which culminate in ideas related to collaboration: participant-based activity, the ideal of authenticity and a process-centred action model are descriptive of the efforts towards collaboration in the training. Critical reflection and learning by doing support this thinking. Functional principles can be traced to an attempt at openness, a network-like way to work, consideration of expertise during the training, consideration of the principle of penetration through the various levels of activity, as well as the effort to integrate the pedagogical, technological and organisational points of view.

Besides, each participant implements an authentic development project during the training, either alone or together with his/her colleagues, in which his/her teaching or work and activities are developed through information and communication technology. The development project aims at integrating the project with the participant's own organisation and work, thus exerting a concrete influence on the universities' teaching practices and action culture. The development projects are narrowed down and the problems are particularised during the training in co-operation between the trainees and trainers. The development projects are documented in the TieVie portal in open web (http://www.tievie.fi/).

The TieVie portal constructed to support TieVie training serves not only the involved participants, trainers, mentors and contact persons, but also other people interested in the educational use of ICT. The TieVie portal is open to anyone with the exception of the participants' personal products, feedback from the participants and mentors' diaries. Special training materials that can be utilised by anyone have been produced to support each TieVie online course. All the materials used in the contact seminars are also documented in the portal. As the training proceeds, the cumulating proficiencies will also be documented in the TieVie portal (in Finnish).

TieVie training (5 credits)

Nationwide TieVie training (5 credits) started in 2001. Two hundred members of the university staff took part in the first programme, and after a redirection of the educational volume the latest course was participated in by one hundred. The goal of the TieVie programme (5 credits) is to help university teachers to apply ICT in their own teaching in a pedagogically sound manner. The training offers peer group support and expert consultation for the planning and implementation of a teaching development project in which ICT is applied. The training looks into the possibilities to apply the educational use of ICT from the viewpoints of online teaching, content creation, supervision and evaluation. The TieVie programme which lasts half a year offers:

- Basic knowledge for the design and provision of pedagogically meaningful online teaching;
- Pedagogical and technical support for the planning of teaching;
- Tools to identify problems in one's own teaching and to design networked teaching;
- A personal experience in online studies;
- A concrete possibility to network with other universities and teachers representing different branches of science and to provide online teaching together.

Starting 2005, the national TieVie training (5 credits) will not be arranged any longer. The TieVie network will be supporting the universities to establish the educational use of ICT as one of their own basic activities. Preparations have been made towards this end for a number of years by training agents in TieVie trainer education and later in the expert training (10 credits) who have expertise and knowledge in, among other things, the planning and provision of in-service training in educational ICT use. The national TieVie training (5 credits) has offered its participants opportunities for networking, exchange of experiences and getting to know the practices of other universities, and thus the challenging issue is how to preserve this important element for the development of the virtual university when the national training for basic teachers comes to an end.

TieVie expert training (10 credits)

The first national training programme, the TieVie trainer programme (10 credits), was launched in 2001. The participants, total 60, came from all the 21 universities in Finland. The amount of participants has been little by little amplified because of demand. In the most recent programme in 2004 there have been 100 participants from the universities and a small pilot group from the polytechnics. The TieVie expert programme has been targeted for university staff with previous education (such as the 5-credit TieVie course) or experience in the educational use of ICT, or who have acquired a basic knowledge of the educational application of ICT in some other way. The training supports the development of the virtual university by training experts in the educational use of ICT for the universities and their virtual projects. The training deepens the participants' knowledge in the educational use of ICT, enabling them to function as trainers, consultants, supervisors, educational planners, support persons, network coordinators or agents in the educational use of ICT. An issue of interest in this training that lasts for almost a year is the pedagogical, technological and organisational change in the university.

The issues related to the educational use of ICT are considered by various agents in the universities. The target of development for a TieVie participant in the educational use of ICT can be, for instance:

- The quality of teaching making use of ICT as part of the quality of teaching;
- Teaching in the department/unit making use of ICT;

- In-service training in the educational use of ICT in his or her own university;
- Networked teaching in a national or international network, for instance;
- Master's programmes;
- Strategy work for and strategic implementation of the educational use of ICT or
- Support for and technological approaches to the educational use of ICT.

Experiences with the training

Detailed feedback has been gathered in the TieVie portal from the participants on the components (contact seminars, online periods, skill courses) of the TieVie training programmes and on the training as a whole. The mentors of the local groups and leaders of the feature groups have gathered oral feedback in tutor meetings and assessed the success of mentoring in their mentor's diaries. Feedback has been received from the TieVie planning group, contact persons and mentors through joint mailing lists. Based on them the TieVie planning group has written a detailed annual evaluative summary and plans for developing the training. When the project has proceeded, there have been regular contacts with the Service Unit of the Finnish Virtual University and the Ministry of Education, among others. No systematic research has been done so far on the long-term effects of the training programmes on the activities of the universities, but feedback related to this issue is received both from the participants and several other agents such as the TieVie contact persons.

The participants have felt that the flexible implementation of the programmes has been a good approach. The face-to-face meetings in contact seminars are important for the participants' commitment and motivation. It is easiest to start a course if the participants have first met each other face to face. Furthermore, networking has turned out to be important for the participants in the organisation of a course. The participants have considered that the main added value of TieVie training is the opportunity for networking and meeting colleagues from other universities. Co-operation in the training has enabled exchange of experiences and comparison of working methods between the universities and added to awareness of the current status of the educational ICT use in other universities.

One of the main benefits of the TieVie training programmes are also the personal experiences in online learning obtained by the participants as well as the opportunity offered by the courses to share their knowledge. As each participant has planned and implemented a teaching development project in which ICT is applied, the programme has had a direct influence on teaching practices and the development of activities in the universities. Along with the teaching development projects put into effect by the teachers, the students have acquired new and increasingly flexible ways to carry out the courses. The participants in the TieVie trainer programme have also carried out in-service training as their development projects, thereby expanding the educational offerings in the educational use of ICT in the university and adding to the use of ICT as a tool of in-service training. Thanks to the TieVie training, local universities have thus acquired know-how and expertise in the arrangements of in-service training in the educational use of ICT. This know-how is very important, as universities are assuming the responsibility for in-service training in the educational use of ICT equivalent to the level of TieVie training (5 credits), and it is being established in the universities. The nationwide educational concept has built up a shared view on the implementation of high quality in-service training and improved opportunities for co-operation to provide training between the universities.

According to the feedback from the participants, the TieVie project has clearly manifested its importance in building a common action culture and adding to collaboration in our scientific community. The course producers and participants and, via the TieVie portal, even other interested people have obtained plenty of models and materials for their own in-service training as well as examples of the possibilities to implement teaching that applies ICT in different branches of science.

The heterogeneous group of participants has introduced a challenge of its own to the planning of the TieVie courses: how to construct a programme that supports the implementation of the highly different development projects by participants coming from different fields of science? It has also been difficult to dimension the scope of online learning. It has been necessary on many occasions in the planning to consider how to keep the amount of work required by a course on a reasonable level. For some of the participants, becoming familiar with the technology as such has required quite a lot of struggling, as have the actual contents of the training. The programmes have been arranged with a tight period of less than a year which adds to the challenge for the university teachers to plan their use of time. In a group of more than a hundred students, it is almost impossible to fit the schedules of online studies and contact seminars into the participants' own working schedules.

The support given by the superiors and colleagues in a department for participation in the training and implementation of the development project is vitally important. It is a demanding task to plan and implement any kind of development project in less than a year. With no support from your superior or colleagues, a project on the organisational level in particular cannot help remaining a torso. Development projects have been successful especially when more than one teacher from the same department or network has been contributing to their implementation. It is easier with a workmate or team to meet the possible resistance against change.

Experiences in the construction of a national network and implementing a project

The planning of a national mass training programme such as TieVie has been a tremendous challenge for the planning group. The planning of the contents and functional structure of the training programme and the construction of a common shared understanding on them alone has required plenty of discussion in a large planning group consisting of 10-15 people. The planning of a training programme through a network needs to be reserved much more time than for a programme to be provided inside a single university. Finding a common time for planning and adapting the training timetables to those of the planning group and the participants is a challenging task as such. It has also been a challenge to integrate the sections produced in different universities into a uniform course, i.e. to find a common thread for the training and to construct the project to be uniform from the participants' point of view has been challenging. Without a true need for networked nationwide action these challenges would not be overcome.

Although the planning group considered it to be an enrichment that the producers of the training programmes include different people from the viewpoint of their educational background and working history, finding compromises is not always easy in tightly scheduled planning. The differences of opinion are often only revealed in practical action. A thorough negotiation on meanings is needed to achieve a joint understanding and shared goals. On the other hand, it is also important to get quickly from the goals to concrete action for the co-operation to proceed naturally.

It was also difficult to estimate the costs of a project with such complex functions when the operations were started. It was only possible after the first round of courses had been arranged to estimate realistically the cost of the various items related to the training and the need for financing. For some of the planning group, problems are also caused by fitting the TieVie duties into their other work duties. For university staff, it is unfortunate that the financing for the wages often comes from many sources, and so the working duties are equally varied. Requirements are presented not only by the worker's own department and the university, but other networks as well. As the TieVie planning group consists of practical agents, having the decisions made by the network accepted by their superiors or other decision-makers at the university can be difficult. On the other hand, excessive hierarchy could also stiffen the activities.

In the first years particular problems were also caused by the fact that the Finnish Virtual University efforts were only taking shape, and there were many problems that were met for the first time on a nationwide scale. The TieVie training has, however, linked itself with merit as part of the universities' own developmental activities (Finnish Virtual University), and helped to add to the co-operation between the support units in the various universities, making it more concrete. Thanks to the TieVie training, it has been necessary to consider support issues even in those universities where support units have actually not yet even been established.

One reason why the implementation of TieVie programmes has been successful is the fact that the planning group has functioned as not only the planner of the training, but also as a provider and trainer in the programmes. It has been strongly committed to the decisions made by the group. The group has discussed democratically both the pedagogical basis of the training and its practical details. All the agreements and details contributing to the success of the training have been recorded comprehensively in a common training co-operation agreement which has been signed by all the parties. The text of the agreement has been polished and supplemented based on the learning experiences accumulated in the course of the years, resulting in an agreement that is a clear-cut document on the responsibilities and joint rules of the game. The provision of TieVie training is the result of a huge joint effort. Without the commitment, a planning group that is pulling together, and strong coordination, it would never have been possible to implement these programmes.

Conclusions

In the course of the last few years, the TieVie project has trained a number of agents and experts nationally for the educational use of ICT in Finnish universities. It is important to study the effects that the training and the participants' development projects integrated with their work have had on the activities of the universities and on the development of teaching: at its best, a participant to these programmes can function as an agent of change in his own work community, but his or her development project can also remain a one-time experiment with no living consequences after the training. The major challenge is to establish the participants' progressive development projects as part of their work communities' activities and at the same time to generate new well-functioning practices for the universities.

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TEACHER'S DEVELOPMENT FOR LIFELONG E-LEARNING

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1. Introduction

When we think of a teacher, we instal him/her into all levels of the educational activities. When we think of a school, we have all forms of educational processes in mind, in which a teacher and a co-participant (a pupil, a student, a participant) are directly and interactively related. In its organisational structure, in which a pedagogical function is a primary one, a school is not separated from the system of societal values of its time period. A school is a legal form of an institution and an open system, which is related to a wider society from which it gets tasks and means for its work, to which it is responsible for its work and from which it pumps educational influences. A school, as an institution and a condition for human existence, has been established by a human and it also has to be changed by him/her. An evident overall emphasis on lifelong learning provision with the means of modern information technology enhanced learning has a strong influence in the development of teacher's profession and occupation.

The most relevant definition for 'lifelong learning' (LLL) is the one from European Commission [1] which says that it is *"all learning activity undertaken throughout life, with the aim of improving knowledge, skills and competences within a personal, civic, social and/or employment-related perspective"*. This includes all forms of learning: formal (courses and examinations), non-formal (without examinations) and informal (without either courses or examinations). In this policy document the concept of 'European lifelong learning area' (which mirrors the earlier one of a European research area) is the area where citizens can move freely to "learn, work and make the most of their knowledge and skills to meet the aims of the EU to be more prosperous, tolerant and democratic".

In fact lifelong learning in its definition covers the whole education area: initial education, basic continuing education and university continuing education. All the listed components are graphically represented in the Figure 1 (a slightly different form of which is presented in [2]). According to some writers the usage of lifelong learning term is so all-encompassing that it is in danger of losing all meaning [3].

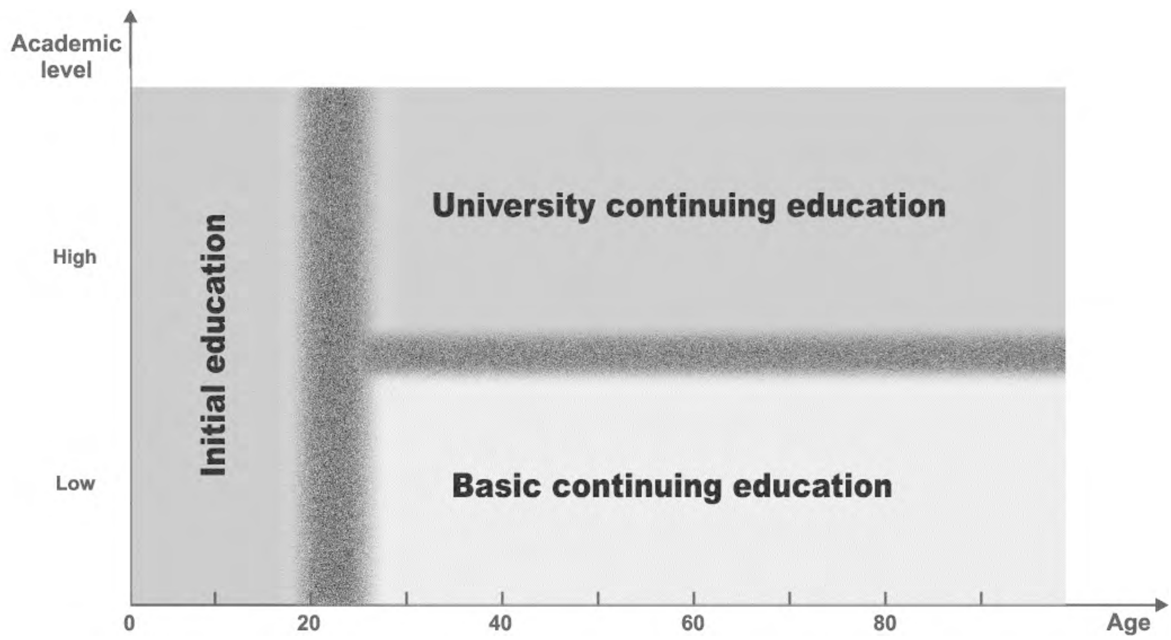

Figure 1. Lifelong learning – the whole area

Very good description of the continuing education from the social point of view is presented by Taylor [4] where it's central concerns are classified as:

- individual and cultural education for personal growth and understanding;
- facilitating the pleasure of intellectual discovery and debate;
- civic and collective education to meet the needs of the community and to enhance democratic structures;
- developing adult students critical faculties;
- disseminating the core value of university education;
- awareness of scientific, environmental and social issues;
- developing effectiveness and capability through intellectual and specialized skills;
- generally bringing together the expertise and values of the university and the life experience and real life issues of the regional community.

3. Information technology and Lifelong learning

"Technology can make lifelong learning a reality" [5] is in a nutshell presented the North American point of view. With electronic tools, people can (theoretically) learn virtually anytime and anyplace they choose without obstacles in place, time and social status.

UNESCO's 'Policy Paper for Change and Development in Higher Education' urges higher education institutions to make greater use of the advantages offered by the advancements of communication technologies so that "each university should become an open university offering possibilities for distance learning and learning in various points in time" [6]. The e-learning is not seen as a shift from the traditional to open learning, but rather as a support to conventional learning processes with the use of modern information technology and distance educational methods. Modern implementation of e-learning in educational institutions can be considered as the result of the convergence process of distance and conventional education.

As recent reports demonstrate clearly, the pace of e-learning and ODL (Open and distance learning) is accelerating, and it is likely to take a growing share of higher education. According to the cited UNESCO report [6] open and distance learning is one of the most rapidly growing fields of education, and its potential impact on all education delivery systems has been greatly accentuated through the development of ICT – based technologies, and in particular the World Wide Web. E-learning at the tertiary levels shows a two-track development pattern. On the one hand, numerous open universities have emerged to absorb large numbers of new learners, while, on the other hand, increasing numbers of traditional universities have begun to offer their programmes also through distance education. The development of new information and communication technologies has reinforced this trend.

In the book where the role of 'Net Generation' is explored [7], the new ways of learning for the new generation are presented.

The new learning process brings up the following shifts:

- from linear to hypermedia learning;
- from instruction to construction and discovery;
- from teacher-centered to learner-centered education;
- from absorbing material to learning how to navigate and how to learn;
- from school to lifelong learning;
- from one-size-fits-all to customized learning;
- from learning as torture to learning as fun, and,
- from the teacher as transmitter to the teacher as facilitator.

Tapscott's research leads him to conclude that the 'Net Generation' is a force for educational transformation. They process information differently than previous generations, learn best in highly customisable environments, and look to teachers to create and structure their learning experience. Furthermore, the importance of understanding the behavioral patterns of the network generation exceeds merely appreciating that they are comfortable working online. A crucial element for successfully delivering virtual courses entails transforming the educational experience so that it is meaningful to the information-age learner.

Due to the overall development and wide implementation of e-learning and because of high number of students that will participate in LLL it is evident that e-learning is going provide technical foundation on which efficient LLL will be built. Nevertheless, to come to this point the e-learning has still to become inexpensive, user friendly, actively motivating, multimedia supported and widely accessible. A complete model for implementing e-learning at a university or other larger educational institutions is presented in [8], where aspects concerning organisation, potential barriers, implementation, planning, infrastructure, administration, evaluation, quality and economics of e-learning are described.

4. How can LLL benefit from technology and innovation in learning processes?

Users/learners of Lifelong learning services to be offered by universities and other educational institutions are expected to be mostly adults with different levels of background knowledge and different levels of ICT skills. Therefore it is cruical that LLL e-learning platforms are built on friendly, easy to use and roboust technology. On the other hand the didactics will have to be designed in a such a way that the learning process is motivating for the learner, that it supports the information age generation (constructivistic learning) and that it improves transfer of acquired knowledge in a learning process into a practice. As far as the high quality access is concerned there is a new technology coming up, namely the m(mobile)-learning which will make the learning possible practically anywhere and anytime.

In majority of e-learning programs offered today, the burden for learning is placed wholly on the shoulders of the learner. When 'e-students' go to a course web site, they enter a menu of activities: announcements, documents, assignments, external links, communications, and tools. Students are expected to navigate through this material on their own, without much support. They are generally offered email links (to faculty and other students, to more material, etc.), but not much more. *'Collaborative learning'* is trying to solve this situation by creating a virtual social space for the teaching and learning needs of the particular group of people inhabiting that space. This space has to be managed. Such a common space is very important for the motivation and effective learning of UCE students that lack the social component of traditional student's environment. Such a system also allows for something that is often overlooked in the e-classroom: recognizing and acknowledging the most valuable contributors. All these qualities are beneficial to the adult learner who is using the ICT as the means of interaction with the educational institution, teachers and fellow students.

It is more or less evident that lifelong learning in general and the university continuing education will experience the consistent expansion in the future. Lifelong learning has a very high priority in European policies and action plans. At the present time there is a lot of terminology differences and variety of concepts in Europe but on the other hand it seems that EU will solve problems in diversity of models and statistics data with common actions within the European area of lifelong learning. There is practially no doubt that the foundation of LLL provision is going to be the information technology and e-learning together with the emerging m(mobile)-learning technologies.

5. Teaching: a profession and occupation

The teacher's university degree for all levels assures teachers a teacher's occupation. The occupation is an activity, for which a qualification is necessary. Occupation can also be a synonym for profession, although some authors do not agree and explain the difference between them. A professional development begins when the occupation is gained and activated. With the term activation of the occupation, an active realization of the occupation is meant, because somebody can have a teacher occupation but does not work as a teacher. A teacher's professional development takes place, when:

- teacher is a coordinator of his/her professional development;
- teacher integrates personal, social and professional level;
- teacher creates a process of cooperation and cooperative learning;
- teacher is active in the lifelong education;
- teacher becomes an autonomical member of his/her profession;
- teacher develops his/her competence.

The basis of the professional development is therefore the teacher's education, knowledge and abilities he/she gained in the time of the university study.

Elements	occupation	profession
Knowledge	starting-point	developmental
Qualification	starting-point	permanent and deeply engaged
Having liking for	temporal	permanent
Autonomy	enstranged	present
Sensitivity for changes	temporal	permanent and stimulative
Ability of critical judgment	temporal	permanent
Sensitivity for argumentative critic	unnecessary	stimulative
Personal development	segmental	up-to-date
Ability of communication	verbal	interactive
Interpersonal relationships	relatively correct	intercultural

Figure 2. Classification of the difference between occupation and teacher's profession

Professional characteristics of a profession involve several areas:

- a professional worth (he/she does his/her work properly, encourages his/her personal development and considers a pupil's dynamic development. Uses democratic interpersonal relationships and acknowledges a difference);
- a professional development (he/she critically judges his/her abilities, actualizes knowledge, encourages innovation);
- a personal development (uses active thinking, carries out moral, cultural and social processes, shows self-confidence);
- an interpersonal development (ability to respect others, motivation, effective communication, interactivity, intraactivity, emphaty);
- a realizational development (ability of application, synthesis, analysis and generalizations, ability to use informational technology to raise a working quality).

If we tried to put the tabular attempt of a classification of the difference between the occupation and teacher's profession in words, we could conclude that teacher's occupation in information society is only then successful, when both – the individual and also the society care for its professional development.

6. Importance of communication in a teacher's professional development

At the interpersonal level the informationally persuasive interaction is necessary, which combines the objective information and persuasion. Interaction is becoming a part in the mutual relationships, which are established between the teacher and pupils, and is mutually influenced by both sides.

The success of interpersonal relationships depends on the level and quality of an established interaction. To make teachers ready to accept the ideas consciously, the teacher has to become openminded for the new generation.

Interaction happens at many levels:

- physical union is shown through the help of nonverbal signs and physical closeness; a bigger physical closeness indicates a bigger participants' emphaty in the communicative process;
- action-reactional union starts with a verbal communication, in which the most important paralinguistic signs are those, which stimulate reactions;
- emphatic activity conditions the mutual influence;
- a dialogue is the highest level of an interactional union, which enables that one becomes accustomed to the other's personality, enables a cognitive and affective unity, mutual trust and attention.

A human needs information to understand what is happening in his/her world. Informational communication is neutral, it helps to understand facts and data, is complex and objective. Persuasion is based on a personal ideal of a teacher, the more the teacher is persuasive with the signs of verbal and nonverbal communication, the more effectively he/she will establish pupils' conviction of an interactive relationship.

7. Conclusion

We have known for a long time that a teacher is not the only carrier of knowledge. Information society has brought new possibilities of education, above all, it has brought reachable and actual information. Technology enhanced learning proved to be very effective, and it has started to be successfully accepted also in Slovenia. Many different aspects of education and e-modeling workshops are entering our lives as a key to the successful online learning. They enable a better acsess to educational programs, adaption of contents and realization according to individual needs, they are able to adapt to the market changes.

In the introduction we wrote that school was established by a human and that he/she has to change it. People change school and now they are introducing all proven characteristics of the informational technology. Pupil's knowledge will be changed by the teacher. The teacher will have to change his/her knowledge and his/her pedagogical approaches. He/she will have to take care of the personal development and the occupation of a teacher will be his/her starting-point. From the history of the teaching profession we will pull an important characteristic the teacher has to have: ability of a spoken word. To this we would add the necessity for the interpersonal trust that develops an ability for emphatic relationship of the projection into the pupil's state, and so the communicative process can be developed, in which two complex personalities are cognitively and affectively united and as such sense new experiences. This human interpersonal relationship and moral ethos should become the foreground of the teacher's professional development.

Our concluding thoughts about the teacher will be dr. Gilly Salmon's words. She said: "Not the technology is the most important, it is meant for serving us, the most important is the individual, whom the technology is meant too (Interview in Večer, Maribor, 5.11.2003, 12)".

Information technology supported learning is creating new means of communication between students (and teachers) and as a consequence new ways of knowledge transfer, such as collaborative learning are evolving. As several shifts of the learning process are identified, one can conclude that the influence of e-learning on education will be very extensive. New social relations are being born between the key players of e-learning (students, university/faculty, teachers/instructors, support staff and administrators). Some eminent authors suggest that a driving force for educational transformation is actually the new generation of learners – the so-called 'Network generation'.

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DESIGNING ONLINE LEARNING FOR HEALTH AND SOCIAL CARE PROFESSIONALS: DEVELOPING THE FUTURE NATIONAL HEALTH SERVICE WORKFORCE IN THE U. K.

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Introduction

This paper will consider the use of an interactive framework to design an online module that prepares qualified health and social care practitioners to mentor students in practice. The framework structure and conceptual basis will be discussed along with the findings of a study that evaluated the experiences of twenty five newly qualified health and social care practitioners who completed the module. The findings indicate that learners developed close online interpersonal relations and increased their skills of reflective analysis of practice and professional development planning. The implications for designing online learning using a framework based on interaction will be elaborated.

Background

Learning in the clinical area is arguably the most important focus for the education of practice based professions such as health and social care practitioners. Higher education institutions in the United Kingdom (UK), in partnership with health care providers, are required to ensure that high quality practice placements are available to pre-qualifying learners. A key element of this provision is that there are sufficient numbers of practitioners who are fully prepared to facilitate learning and support learners in practice and that they are regularly updated and supported in their role (DOH 1998; ENB 1995 now NMC).

The module designed to prepare practitioners to become mentors has been delivered by the School of Nursing and Midwifery, University of Southampton, as a traditional classroom based learning module. In order to ensure there are sufficient numbers of mentors, the module is delivered up to four times in one academic year at six different study centres in the South West of England, stretching over one hundred miles apart, including the Isle of Wight and Jersey. Traditional delivery methods are seen to be time and labour intensive for both learners and teachers and make a low contribution to developing the future workforce with a range of e learning skills needed for working in the National Health Service (NHS) in the future.

The NHS, like other large organisations are placing greater emphasis on high quality, customisable, convenient and timely education to enable a work force to learn, re-learn and respond to changes in professional practice. Recent calls for the development of a culture of life-long learning in the NHS incorporate increasing the role of technology (Robinson and Shakespeare 1995) which is likely to make on-line learning the dominant means by which learning and learner support is organised in the future. Online learning is seen as assisting health and social care professionals to be more resourceful in their methods of learning, innovative in their practice and encourage sharing of knowledge in a multi-professional learning and working context in the future (DOH 2001).

More flexible forms of learning associated with online education, have developed considerably in the last two decades (Lewis 1995; Peters 2001). Computer mediated communication is now commonplace with on-line computer based programmes and daily access to learning materials, any time, any where, viewed as standard (Teeter 1997). Some of the more common learning activities used in Health and Social Care education, such as enquiry based learning and practice-focused scenarios that include reflective analysis are particularly suited to online learning. However, as Peters (2003) points out, the process of transferring learning from classroom to online is complex and suggests a need to re-consider curricula structures, methods of learning and teaching as well as administrative structures in order to change from the rigid and fixed to the flexible and adaptable.

The School of Nursing and Midwifery, University of Southampton, as a result of updating its e-learning strategy and further integrating research and practice education, introduced a framework for the development of online modules. The web based template system adopted by the University is Blackboard which offers a variety of learning and teaching tools. However, as Schulmeister (2001), points out, such virtual learning systems tend to be most commonly used for the transportation of subject matter content and not as a medium of self-organised active learning. The Blackboard system creates possibilities for interaction but unless educationalists have clear aims set out for the various forms of interaction and the learners understand these aims, the system merely represents a vacuum in the learning milieu. A set of quality guidelines was available in the School of Nursing and Midwifery that had been written to ensure the quality of the delivery of online modules but did not guide developers on how best to use Blackboard to create active learning. For this module it was essential to create structures that would replace the traditional teaching process used in the classroom and enable learners to achieve the same module learning outcomes and successfully complete the module assessment through supported self-directed means.

Interaction framework

The framework (Table 1) is designed on the basis of three forms of interaction (Paulsen 1995; Gunawardena and Zittle 1996). These are firstly, learner interaction with subject content, secondly, learner interaction with peers and thirdly, interactions between learner and teacher. Interaction with content was organised through the use of learning activities that directed learners to address parts of the module content in a particular sequence (chunks of learning). The work of the Universities Collaboration on e-Learning (U.C.E.L.) with 'Re-usable Learning Objects' (RLO's) was helpful as was the work of Duval et al (2002). An important aspect of the design of activities is that they should require learners to first reflect on their own practice context before considering theoretical issues. This is an important starting point for newly qualified practitioners as they are just becoming emerged into a unique practice context that they still needed to make sense of. The activities require them to use a range of resources to develop critical analysis of relevant theoretical concepts, creating evidence to support ideas. After completing activities learners are asked to share individual conceptions online with their peers and module facilitator to adapt and build multiple representations, guided by feedback from the module facilitator (Laurillard 1997). The learning activities form the platform for meaningful, goal directed interactions with the subject content. Sharing outcomes, answers, ideas and findings after completing designated activities created, with the use of Blackboard's discussion space, opportunities for peer to peer interaction. Feedback from the module facilitator focused on maintaining motivation and guidance (Tait 1995; 2000), created opportunities for learner and teacher interactions with additional opportunities provided by Blackboard's e mailing facilities.

Table 1: An Interaction Framework for supported, online, practice focused learning

Three Forms of Interactions ↓ Peer to Peer + Learner and Teacher + Learner and Subject Content
Informing: • Selection of Blackboard facilities to assist all three interactions • Learning activities to assist practice focused reflection applied to subject content • Learner support model to direct learner and teacher interactions

This interaction framework influenced the selection of a learner support model that aims to strengthen self-regulated learning by focusing support on guiding learners and emphasises personal interactions between learners and teachers (Lawton 1997). This model recognises the importance of helping learners to 'move on' in terms of manage their own future professional development. The framework also played an important part in helping to ensure that the process of delivering the module satisfied the Quality Assurance Agency in Higher Education standards for learning at a distance (QAAHE 1999) and advisory standards set down by the Nursing and Midwifery Council (NMC).

A number of Blackboard's facilities were selected to assist the process of interactions which together resemble an adjusted form of what Evensen and Hmelo (2000) describe as distributed problem-based learning. The Blackboard facilities include the following:

- 'Announcements' which were used to communicate regular notices and messages
- 'Assignment' which gave learners access to the module assignment in a number of sections each of which were linked to an appropriate set of learning activities
- 'Discussion' where learners posted their findings after completing learning activities to share with peers and the module facilitator provided feedback on their work. A timetable was provided to assist peer discussions
- 'Group e mail' assisted all members of the module to communicate with each other
- 'External links' provided direct access to online journal articles and relevant web sites
- 'Resources' where learners found a broad range of learning resources designed for the module. For example, hand outs, video presentations, summaries of key reading
- 'My Personal learning Space' providing learners with a personal file system, accessed by learner and teacher only. This is used to complete and store personal development plans, personal details and draft assignment work

Learners were given a learning guide to direct them through a process of self-diagnosis of existing learning skills. This guide provided direction for increasing essential and desirable skills and required them to create an individual learning plan (or update an existing learning plan). Learners started to use the guide prior to induction to the module and they submitted it to the module facilitator to gain feedback at the half way point and end of the module. Dates for submitting individual learning skills work were included a module schedule.

A module schedule was drawn which started with opportunities to attend induction, alternatively, the process could be carried out online and information posted to learners' home address. A one week familiarisation period was arranged immediately following induction. Learners had one week to practice using Blackboard, become familiar with the module content and prepare their learning plans. Learners were expected to follow a set of dates for posting their findings after completing designated learning activities. This included an agreed date for when feedback would be placed on Blackboard by the teacher. A schedule for completing assignment draft work was introduced. In a similar way to a learning contract, dates were agreed with each learner for sending the facilitator one draft of the assignment and the facilitator agreed a date to provide feedback. 'My Personal Learning' space in Blackboard was used to assist this process.

Evaluation methodology

The aim of the evaluation was to explore learners' experiences of using Blackboard to interact with content, peers and teachers. The evaluation method followed a naturalistic, case study approach (Stake 1995). A combination of data collection methods were used, including: an online evaluation form, documentary analysis and questionnaires. Ethical approval was obtained from the University's Research Committee in accordance with the University's procedures. Following approval, a letter was sent to all of the twenty five students explaining the study and asking for their consent. Anonymity and confidentiality were ensured.

A process of open coding was used to analyse the data in which themes were identified based on issues and concerns that were important to respondents. The result at each stage was a range of thematic perspectives that reflected learners' experiences.

Findings

Overall the experience of the module teacher and evaluation from learners, suggests that the structures used to operate Blackboard and support the online learning process were effective and most learners (84%) said they felt better supported with online learning than they had with classroom based learning. Offering a timetabled schedule on Blackboard, enabled learners and teachers to travel along the journey together and created a sense of presence communicated through Blackboard. Even though learners could, if they preferred, follow a pace that suited their own learning circumstances (12%), they were aware of how far their peers and the teacher had moved in the module at any one time. Learners described a sense of presence that made them feel closer to peers and facilitator than they had expected which contributed to feelings of being supported.

The most important aspect of interaction with content was that, as experienced practitioners immersed in their world of practice, their knowledge and experience formed the trigger for their individual learning and when shared with their peers became a personal learning strength that was recognised, captured and reflected back to learners. Learners said they felt more in control of their learning and felt greater ownership of their knowledge than they had when learning in the classroom. As one respondent observed:

> "There are a lot more choices about how and when I can study.
> This made me realise that I can be much more self-disciplined than
> I thought. I plan my work out which has given me a sense of achievement."

Some students had difficulty with using Blackboard for the first time and were reluctant to practice at first. Some learners (34%) expressed concern that there was very little time to study when they worked full time and had child care and other family responsibilities. The requirement to use their own personal time was made obvious by the activities and the timetable. As one learner explained, "It made me look things up" and another, "It has helped me to remember because I can take my time to look things up and keep doing it until I feel confident". The demand on time and self-directed learning skills was counteracted by an increased sense of ownership of new knowledge and personalised learning. As one learner explained:

> "Much more opportunity for discussions and sharing experiences
> which I have enjoyed. The one to one communication was based on
> my needs and my circumstances."

Learners considered the interactions to be closer than they had previously experienced, frequently saying they had "got to know each other better" or they had "learnt more from each other than they had expected". Experiencing communication and interaction of this nature is an important aspect of learning in this context for these learners. All of the learners agreed to continue to maintain contact with each other through a virtual environment.

An increased awareness of own learning needs is apparent in the data, as the following learner explained, "It helps show me what I already know and what I need to know". Another learner explained "I now know my weaknesses and what I can improve on". Because updating their personal learning plan was integrated into the module, learners considered this to be a complementary activity and not an extra load in addition to studying the module. Only a small number of learners said they would continue to use their plan as part of their professional development (24%). This may be because at the present time they are not required to show their manager a plan.

Implications

Designing online learning and teaching is not fundamentally different from designing classroom based learning and teaching but it does require different approaches and involve different structures. A team approach, involving technologists as well as academics and academic administrators is essential to develop greater synergy and benefit from complementary areas of expertise. Just as learning opportunities are enhanced when a 'partnership' approach is adopted in online learning and teaching (Morgan 2002), those involved in the education of health and social care professionals must come to understand the significance of a culture of partnership for e learning planning when terminology, technical systems, skills needs of learners and learner profiles are undergoing constant change.

Conclusions

Recommendations are limited because of the small scale of this evaluation and further research is needed to explore the relationship between the design of online learning and teaching structures and learner and learning outcomes. The interaction framework informs a staff development programme in the School of Nursing and Midwifery, University of Southampton, using proforma, guides and other materials, including an e-activity building algorithm, to assist teachers to become online facilitators. Over time it is expected that new facilitators will develop new online learning structures to meet the needs of a broader range of learners, partners and stakeholders. This framework has been helpful in placing an innovation into the context of the School, the needs of the learners and the people involved.

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ELISE 2004 – ONLINE IN-SERVICE TEACHER TRAINING

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Abstract

The introduction of novel information and communication technologies and systems, combined with a more active and social learning and teaching process, has had significant influences on the traditional teaching practices. In-service teacher training faces the challenge of adapting to these new trends, and transforming the traditional face-to-face teacher training sessions towards a more interactive learning process using modern learning technologies (making anytime-anywhere in-service training possible). We describe the implementation of an intensive in-service teacher training program, which runs for eight weeks – fully online. This e-course (its full, translated title now is: "e-Learning: Methodological and educational aspects of e-learning processes and applications – an on-line course for lecturers/trainers in tertiary education") was developed in the framework of a European Minerva project 'ELISE'. The scope of the training programme was the translation of the constructivist model into the didactics of on-line teaching and learning. During the first full run, 20 teachers participated. The course is being ported to at least three other institutes for higher education in Flanders, and the second run will accommodate over 60 lecturers/trainers. The e-course was also translated into English, for future use by the international project partners.

On-line learning for teachers

In-service teacher training faces two significant challenges as we enter the 21st century. Novel teaching techniques, such as technology-enhanced teaching, the use of e-portfolio's for student tracking, or problem-based education, are being introduced to and implemented by the teacher corps (for a general overview on how the internet affects education, see, for example, [Brown2002] or [Siemens2004]). The second challenge involves the in-service training process itself. In order to successfully reach a larger audience, *anytime anywhere* training, using e-learning practices and collaborative learning techniques, are being investigated, with varying results [Zemsky2004].

This article describes the design and implementation of an intensive 8 week distance learning program, focussing on the didactics of e-learning (a), and the lessons learned (b). The course runs fully on-line, with an optional face-to-face kick-off meeting.

The main challenge of using e-learning in the educational process, is the educational and methodological transition that has to be made. "*If we are going in the wrong direction, technology will get us there faster*" [Haddad2002]; if the teacher fails to adopt a new way of transferring knowledge, and merely uses technology as an add-on to the conventional classroom sessions, the technology will have only marginal benefits. This explains why e-learning often has a negative connotation with teachers and students [Massy2002, Young2004].

The added value of using a web-based learning environment for the in-service training in e-learning, is that teachers themselves experience learning in a collaborative and coached on-line environment. Most teachers never personally experienced this learning method, and therefore often do not fully appreciate the unique benefits and risks or problems.

ELISE – A gracious woman with European interests

E-Learning in **in-s**ervice teacher training in **E**urope – ELISE – is a EU-Minerva funded project (09/2002-09/2005). The participating partners are *Vliebergh-Senciecentrum, Leuven Catholic University* (Belgium), *Fontys Hogescholen Tilburg* (The Netherlands), *University Lodz* (Poland), *University Aberdeen* (UK), and *Université le Mirail Toulouse* (France) [ELISE2004].

The ELISE e-course in online learning is intended for in-service teachers wishing to acquire a more complete understanding of educational and methodological aspects of the implementation of e-learning processes in their everyday teaching practice. Moreover, the whole theoretical framework presented in this e-course is mirrored by a series of specialized practical modules on languages (in different formats of *Webquests*, lesson concepts and software training), Science (Concept Mapping), and History (on the use of on-line sources). These topic-specific modules illustrate how different concepts presented in the e-course work in practice. Each of the teams of authors of the exemplary courses determined appropriate content for their subject area, while sharing a constructivist approach to teaching and learning through ICT.

Modus operandi

Trial run

The first run of the ELISE e-course took place in March 2004 in Flanders. The main criterion for the design of the e-course was that it had to captivate the people who wanted to use it. This required the use of personal and informal language, small assignments and a user-friendly interface (e.g. short content pages that do not require scrolling, easy navigation). The result was an e-course of about 40 web-pages, composed of an introductory module and seven main modules. Each module was organized into units that consisted of a Focus Question, an Information Unit and a Learner Activity. The technical framework of the in-service teacher program was intentionally kept as simple as possible. An existing digital learning environment, Galatea [Galatea], was used for our content modules. We used an open-source forum-software package (PHPBB) to enhance this environment. This rather simple and straightforward digital learning environment ensured that the on-line experience was not clouded by technical issues or the necessity for an additional technical training for the participants, and focussed almost entirely on educational content, learning and reflection tasks, and discussion. On the other hand, the use of a more advanced learning management system would give the added benefit of a wider array of enclosed tools, and of a more thorough student-tracking system.

The first introductory module examined the background on which the whole discourse of e-learning is based. The second module focussed on instructional design, the third on learning assignments. The fourth module dealt with communication. In module five and six the issues 'feedback' and 'assessment' were focussed on. Finally, an optional module elaborated on the more technical issues with regards to learning management systems. These eight modules cover most modern innovative technology-enhanced teaching practices.

The trial run of the e-course lasted for three weeks with two face to face meetings (a kick-off meeting and an evaluation meeting). About 25 teachers participated. The participants were very free to take the course according to their personal wishes. They could jump from one module to another and they were not obliged to complete the assignments. Although this pilot run did not meet the requirements of a professionally coached e-course, the general evaluation was fairly positive. In particular, the opportunity to share experiences in the forum was highly appreciated.

First full run of the e-course

Valuable lessons were learned from this first trial run:

- The content modules were restructured, significantly elaborated and rewritten to contain more relevant interesting practices, examples and theoretical background.

- The number of assignments was drastically reduced from five to one per module.
- Two e-coaches would provide feedback and support the learners.
- The content was made visually more pleasing by adding pictures and animations.
- The course was prolonged from three to eight weeks, ensuring that each week one module could be thoroughly discussed by the learners.
- A strict learning path was enforced, i.e. each week one module was treated, with fixed weekly deadlines for the submission of their own assignment and the required feedback postings.

Furthermore, the two e-coaches of this first full run were participants in the trial run. This approach ensured that the e-coaches are fully aware of the limitations and of the opportunities of the e-course – from student to co-instructor and co-designer, under close supervision and coaching of the ELISE project partners.

The content modules were written by a multidisciplinary team working in a wide area of higher education: from universities to institutes for teacher education, from nursing education to trainers of ICT experts and of architects to lecturers in linguistics... This multidisciplinary approach resulted in content modules which are a cross-section of a wide array of modern e-learning philosophies and practices, but also results in seemingly contradictory statements throughout the modules, reflecting the personal views and expectations of the various authors. This is not seen as an inconsistency, but rather as an added value provoking discussion. The added benefit of this multidisciplinary approach is that the participants could view the experiences from a different angle, and more generic e-learning practices were discussed as a result.

During an initial face-to-face kick-off meeting, the coaches and most of the participants met, ensuring a fluent start of the course. Such an initial face-to-face meeting is said to ensure that students overcome their natural fear of posting in an unfamiliar digital forum [Lynch2002]. It has been our finding, however, that the teachers who were not present in the initial meeting, did not show any initial shyness or did not have any additional initial trouble. We attribute this to the fact that the group started in the on-line environment on a very casual and informal manner, and thereby also ensured that the newcomers immediately felt comfortable and reassured.

Experiences

During the autumn 2004 run of the course, the first full run, 20 teachers participated. As mentioned, this group consisted of staff from a wide variety of sectors and backgrounds. This variety made the experience for those teachers much more interesting, because they were confronted with conflicting views and dramatically different opinions with regards to the implementation of e-learning (*learning from different perspectives*). The course ran from October to December 2004 (8+1 weeks). In week 4, a mid-term break was inserted. During each module, the participants were required to study the learning materials, read (some of) the background texts and sites, and post one reflection assignment. They were also required to read the posts of their colleagues, and provide feedback to at least two postings before the end of the week (*learning from feedback*).

The experience, both for the two e-coaches and for the participants, was very rewarding. The participation of the teachers was remarkably high, which was unexpected because of the wide variety in their backgrounds, interests and ICT skills. Of the 20 participants, 17 obtained the certificate of successful participation.

The discussion forum was used intensively by the participants. Typically, 70 discussion messages were posted each week, ensuring a lively but somewhat hectic forum. The participants clearly valued this content-rich format, but on the other hand complained about the time-consuming character of this method of learning. The proposed 2 hour weekly time allocation did not allow, they wrote in their evaluation comments, to even superficially monitor the forums. They indicated that they spent almost 4 hours each week to read the course material, post their own assignment, and provide feedback to their colleagues.

In Figure 1, the number of unique postings is indicated for each module. The number of assignment postings (ideally one per week per participant), feedback postings (ideally two per week per participant) and e-coach feedback postings clearly mirrors the intensive forum activity throughout the course. The e-coaches ensured a lively start of the course by posting an very high number of own postings and providing immediate feedback to the first forum activity. This intensive initial coaching ensured a fluent start of the program. It can be clearly observed that the commitment to the course gradually wears off as the time-consuming and intensive program continues for the eight modules. It remains clear, however, that the minimum commitment (i.e. at least one assignment post per week) is still met, even after eight weeks. The feedback postings to other participants, however, decrease much more significantly. Furthermore, the eighth module (which is optional, and of a more technical nature) is obviously not studied and discussed with as much force as the other (obligatory) modules, although a large number of participants nevertheless submitted an assignment post.

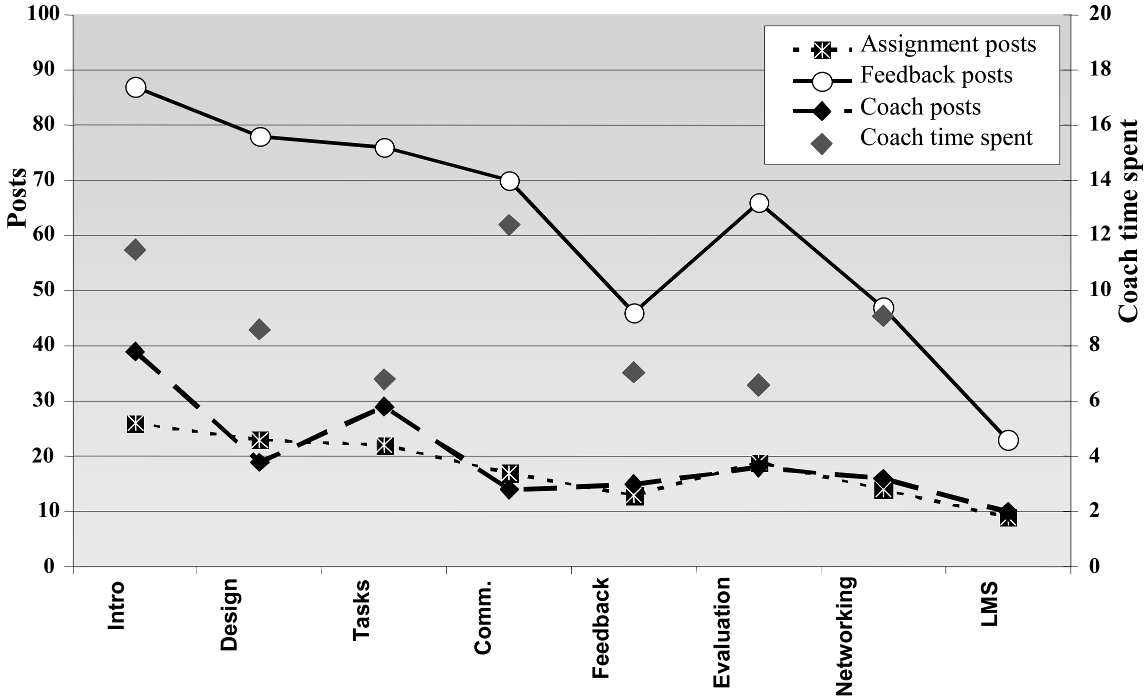

Figure 1. Illustration of the number of (assignment, feedback, or e-coach) posts for each treated module, and the associated time both e-coaches spent providing feedback or finalizing the content

The time which both e-coaches dedicated to the coaching of the e-course, was between 3 and 4 hours per week per coach, as can be observed in Figure 1. This time did not include administrative procedures (enrolment, e.g.) but did include (certainly during the first weeks) technical support for the learners (helpdesk, log-on problems…). The peak moments were in week 1, on module 1, when both coaches went through considerable trouble to ensure a fluent start, by posting a probably exaggerated amount of feedback postings, and during week 4, when the course documents for modules 5 through 8 were finalized.

It was considered, both by the participants and by the e-coaches, an added benefit that there were two coaches for this e-course. For the participants, this had the benefit that distinct (sometimes different) views on e-learning practices were posted. For the e-coaches themselves, having a 'backup' means that the fast pace of the course – where often daily interventions were required – remains bearable. In this course, the coaches had not made any agreement between them about the focus or topics or course participants they would be coaching.

Not the technology but the people

A balanced mix of goals, content, learning activities, technology, coaching and learners made the ELISE e-course a success for all participants. The learner group, although very diverse, was surprisingly effective in supporting each other and in sharing interesting practices: the teachers quickly participated in all forums, and did not show any significant initial shyness. We did not observe the formation of subgroups in the forums.

The format of the course was also very much appreciated: although a strict learning path was laid out (with regards to time and content), the participants were free – within one week – to work at their own pace. The strict pace was not considered as problematic, although several teachers complained about the intensity of the course and the required weekly work. All participants agreed that a similar course, with comparable objectives and content and sharing of own interesting practices, in a classroom face-to-face format, would require a considerable amount of time which can not be freed on a weekly base.

The e-coaches enormously appreciated the administrative and technical support (enrolment and registration, user accounts, evaluation, practical organization of face-to-face sessions…). This means that they could focus – to a large extent – on the coaching process itself.

We attribute the remarkable success of the training program to several factors:

- The course was significantly structured with regards to time (clear starting and ending times for each module, and deadlines for both assignment and feedback postings). Both the participants and the e-coaches were at all times aware of 'what', 'when', 'why' and the evaluation consequences. The communication, task and procedure scripts were part of the course.
- The recruitment process for the participants focused on teachers with some relevant e-learning experience, and it was clearly stressed that the course was very intensive and time-consuming. Since this was the first full run of such an on-line learning course in e-learning in Flanders, we can assume that we recruited motivated teachers (the 'early adopters').
- The evaluation of the participants' participation was clearly known to them. The participants received a formal certificate of successful in-service training, but only when they fulfilled the requirements.
- Both the authors and the e-coaching team had already participated in the trial run of the course. This ensured that valuable lessons were learned, and the same mistakes were not made again.
- The wide variety in authors and e-coaches ensured that different aspects of e-learning were treated, and that the participants were faced with a wide variety of content, assignments and feedback.

We can safely conclude that the main success factor of the e-course was not the content (which can be easily studied individually at one's own pace), nor the technology or format, but rather the learner group itself, which was surprisingly motivated and self-supporting.

Lessons learned

Two external experts (Stijn Van Achter and Koen Vanmeerbeek, *Onderwijs Service Centrum* (V.U.Brussel)) were contacted to be external critical evaluators of the e-course. Based on their findings, and the evaluation of the participants, several minor changes will be made to the format and the course for the next run this spring (February-March 2005):

- The suggested weekly study time for the participants was increased from two to four hours, in order to give a more realistic estimate of the required workload.
- The content modules themselves will be restructured in order to fully use the web-format (e.g. we will add multimedia-components and provide more external hyperlinks and internal structure).
- The number of participants per learner group will be limited to no more than 15. We observed that the initial 'hectic' forum was largely attributed to the large group (20 initial participants) all posting one or several introductory messages – making the 'getting to know each other' phase problematic for some.

- The nature of the weekly assignments will be remodeled in order to contain more variation. Team-work and instructional design will become more important.
- A mid-term chat session will be introduced in order to further strengthen the learner group.

Conclusion and future prospects

Because of the remarkably positive evaluation of this on-line course on e-learning, by the e-coaches, participating teachers and ELISE project partners, it was decided to ensure its continuation by gradually expanding the scope of the programme. A more elaborated advertisement campaign resulted in the participation of more than 60 teachers in the next course (spring 2005). Furthermore, the e-course was ported to (currently) three institutes for higher education in Flanders wishing to adopt the course in their own lecturer training programs. Finally, the course was translated into English for use by the other ELISE project partners and a further translation into French is envisaged. In order to accommodate this rapid growth of the on-line in-service teacher training programme, at least four additional e-coaches were recruited, again among the participants of the autumn course run.

We can conclude that the ELISE project has resulted in the formation of an inter-disciplinary network for e-learning specialists and e-coaches in Flanders. We are currently investigating the possibilities to expand this network to a more formal e-learning support group throughout Flanders. We can also conclude that the ELISE e-course managed to find a balanced blend of interesting content, professional and experienced e-coaching, and an active and content-rich discussion forum.

The authors wish to acknowledge the e-teachers for their enthusiastic and optimistic participation, the content module authors for their didactic experience and participation, and Stijn Van Achter and Koen Vanmeerbeek (Onderwijs Service Centrum, V.U.Brussel) for their critical evaluation remarks.

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LIFELONG LEARNING AS A KEY ISSUE IN STAFF DEVELOPMENT

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Even where technological infrastructure and support are strong, and even when worthwhile learning applications are developed, without staff development nothing is likely to happen beyond pilots.

Salmon, E-Moderating, 2000

Abstract

Almost every university nowadays is developing e-learning. As every innovation, this process needs special organisational means to overcome Moor's chasm when the phenomenon starts to seize majority of teaching staff. This paper reports study results of the Minerva UNIVe project staff training group. Aim of the project is to build a consortium type e-learning university model integrating know-how from existing EC supported projects on this theme and studying experience of the 8 universities from 6 different countries and in according national e-learning consortia. All eight had to answer the open ended questions to report their e-learning situation: e-learning courses, staff training and support means etc. In this paper we report the background, importance of the study, summarize organizational tools universities use and make some suggestions.

Introduction

E-learning has been in the centre of attention now already for many years and many European universities have published their white papers and action plans to foster ICT supported learning in traditional learning situation, in distance learning and in any combination of them (flexible learning). Adaptation of eLearning initiative by European Union in May 2000 and Action Plan in 2001 has seen e-learning as key factor for institutional change and development in higher education [1]. The number of research papers and number of EU collaborative projects in this field is growing rapidly. These projects have had very different aims: to develop technical tools, to create e-learning management environments, comparative studies of those tools and environments, to collaboratively create tutor training courses, to plan evaluation tools and quality indicators, to find impact of certain ICT tools on actual learning process, to develop international collaboration models etc. [1,2,3] The HECTIC Report [2] claims among other things that "among the most important factors is the question of staff motivation".

Teaching staff of university studies and corporate training is one very important target group for life long learning. As e-learning is a tool which makes life long learning possible for many different target groups in the rapidly changing work environment, the development of e-learning itself relies mainly on the know-how and attitude of the teaching staff. Especially the university teachers have been known as a fastidious and independent group. They are used to making their own decisions and as it is always complicated to change peoples' attitudes, it is especially complicated to force these people to start to profit from e-learning as a useful tool.

The key problem is: What structural and legal changes might facilitate academic staff to change their teaching methods to incorporate ICT? How policy objectives and educational development stimulate real everyday teaching practice?

These questions are in the focus of interest in the new Minerva UNIVe project [4]. Its aim is stated as follows: UNIVe aims to collect and share the knowledge and experiences of developing a consortium-type e-university. Establishing consortia for using better limited intellectual and financial resources is one opportunity to be successful in the situation of growing international competition. In order to provide an e-university model that would be relevant for different European countries, we integrate available e-learning know-how of the previous successful international projects and analyse and integrate existing consortium type e-university models from Finland (Finnish Virtual University[5]), Sweden (Net University[6]), Scotland (Interactive University[7]) and Estonia (Estonian e-University[8]). Project partners are eight universities: four from Estonia, four from three other partner countries: Finland, Sweden and Scotland. All participating universities are members of their national e-learning consortia.

Six thematic groups have been formed in UNIVe project to study different aspects of e-learning. The authors of this work belong to the staff training group. Our objectives are: to analyse previous experiences in supporting, motivating, and training academic staff for developing e-courses. Centralised and decentralised models of financial, technical, and pedagogical support, administrative regulations and staff training are under discussion. We will compare the situation in 8 participating universities from 4 different countries and will study number of EC projects in eLearning staff development field. This presentation tries to summarize results of interviews with number of universities.

Importance of the study

Majority of European universities have undertaken steps to develop e-learning. Innovators have worked to create the very first courses, group of early adapters have followed their example. We stay now in the point where we believe that e-learning is not just for enthusiasts, but majority of university learning can benefit from it, open up universities for life long learning. Going from a few innovators and early adaptors enthusiastic groups towards majority, even so called early majority, social rules of the technology adaptation start to work and Moor's chasm has to be crossed [9]. As innovation adaptation, which does not need special organizational and financial support in the stage of enthusiastic innovators/early adapters – they manage always to find finances for first experiments – e-learning becoming mass phenomenon needs now special organizational effort. With special support we can overcome the Moor's chasm [4, p 12], otherwise the process will be lengthy and not very successful, it may create frustration which can put serious brakes to the further development. We can formulate objectives of our study as looking for common and individual means at the university level for bringing e-learning from enthusiastic experiment stage to mass phenomenon, i.e. how to overcome a Moor's chasm of innovation, in transition from small scale experimentation to full deployment of e-learning. And here teachers are the key factor and their own process of life long learning is vital.

We know that all universities participating in this study have implemented their first supportive mechanisms – technical assistant people have been hired, courses for teaching staff have been developed etc. We will try to find common roots in their development. We will study the e-learning situation in our group of universities, the role of an e-learning consortium, means of organisational and technical support – this is the theme of this study.

Present study

To get a picture of e-learning situation in a group of universities, we collaboratively prepared an open interview type of questionnaire for participating universities of the UNIVe project and two universities in Latvia and Lithuania. This questionnaire has not been aimed at particular key persons to answer, but we expected it will be answered by a team of people at every university, hoping it would give a picture of the university as an organisation, not one person's subjective view of the e-learning situation at this university.

One part of the questionnaire tries to figure out how national e-learning consortium helps its universities to develop e-learning. All four consortia are different – they have different history, different status in their countries and different number of participating universities. Our aim is to understand the ways a consortium helps solve staff training and motivation problems.

Basic info about e-learning developments in selected universities

All universities under observation (see table 1) have many campuses (2-5) – it obviously raises their interest in e-learning as very often campuses are more than hundred km apart. In Estonia all large major universities have many campuses which is a result of the reform in higher education where many small colleges were connected to large and stronger entities. This may be the case in many new European countries.

All universities have already launched the web-based study information system (SIS). This means automatically that all students and teaching staff have to be able to use it as more and more management information is going through SIS.

Table 1: Basic data about universities participating in this study

Organization	Country	No of campuses	No of students Total (part time)	No of teaching staff	No of years in e-learning
Mid Sweden University	Sweden	4	8660	450	8-10
University of Joensuu	Finland	2	7196	361	6-7
University of Stirling	UK		8400 (1600)	466	5
University of Tartu	Estonia	5	17 653 (4648)	1206	8
Tallinn Technical University	Estonia	3	9611 (249)	679	5
Tallinn Pedagogical University	Estonia	3	6421	381	3
Kaunas University of Technology	Lithuania	2	22174 (7090)	1000	5
Riga Technical University	Latvia	4	7100	662	5

As a matter of fact, majority of universities are using two different systems to support learning management: web based Study Information System (SIS) – which is normal university level ICT-based information system to help university management (student registration, statistics of study results, etc.); and Learning Management System (LMS) – systems like WebCT or Blackboard which aim is to support learning process itself. Both systems have common parts (for example: student registration), but according to our study, both systems have been developed in many universities separately and are not yet connected – lists of registered students are transferred manually not automatically from one system to another for example. Number of universities plan to develop automatic connection between those two systems, but obviously this will take time.

E-mail accounts are compulsory and delivered to all students and faculty members in most universities – it has to be considered compulsory prerequisite for implementation of e-learning which covers majority of the university.

Average experience using LMS in this group of universities is 5 years, varying from 3 to 10 years. As the number of e-learning supported courses is in most cases over 100 courses (which is less than 10% of all courses), it shows, that Moor's chasm has not been overcome yet and e-learning supported courses are not yet the mainstream way to deliver courses.

Only Mid Sweden University has a Master programme in e-learning. All other universities are preparing their e-learning specialists and training their teaching staff either through different separate courses, supportive projects or self study.

All universities have an e-learning strategy plan – either as a part of the development plan or as a separate document. Only Riga Technical University has only university level agreement to develop e-learning materials.

All selected universities in Sweden, Finland, Estonia and UK belong to national e-learning consortia. University of Stirling is the member of 3 different consortia: ELearning Alliance, Observatory on Borderless Higher Education and Interactive University. There is no national consortium in Latvia and Lithuania yet.

Staff training and support

The part of teaching staff involved in e-learning is very small in majority of universities we studied – less than 10% of all teachers, except in Stirling University, where it is about 15% and in Mid-Sweden, where it is around 50%. The latter are comparatively small universities with considerable e-learning history (9 and 5 years accordingly).

The task to organize courses for teaching staff about different sides of e-learning is allocated either to a special department (Example: Joensuu and Mid-Sweden) or are organized by the university and the consortium to which the university belongs. Majority of courses are organized in flexible form, combining e-learning with face-to-face sessions. Study groups on these courses are formed on overall basis – very few courses are organized separately at one faculty or department only.

Many popular courses place emphasis on technical side of e-learning (usage of some technical tool) – teachers are not very eager to accept the need to change their pedagogical repertoire and to recognize the lack of pedagogical knowledge.

Many teachers need support in preparing and running e-learning courses. The support staff (number of educational technologists) varies a great deal among this university group. When in experienced universities there are more than 10 (in Joensuu even 30) persons whose main task is to support teachers to prepare e-learning courses, then others have only 2-3 people to do this. In Estonia where we can follow the process dynamics, number of support staff is growing fast. For example, in the University of Tartu, which had only 1 educational technologist in the beginning of 2004 has now (in the beginning of 2005) already 7 of them. Majority of support staff is working at university level; some are in faculties and separated colleges.

The financial resources for support staff are mainly coming from university budget, additional resources are project-based. All universities in the group had prepared materials to support development of e-courses. A number of universities have printed materials, but all have web-based materials. The latter is most suitable form as the environment for e-learning is developing very fast and materials need regular upgrading.

Different universities use very different methods to promote best practices and examples of e-courses. Mid Sweden University uses open presentations, others use course contests with awards for best courses. Seminars are organized to discuss which teaching methods work best in e-learning situations.

Regarding future plans for e-learning development – nobody has exceptionally new organizational methods in the plan. All plan to prepare new courses, courses for staff training, to hire new support people.

Actual problems

As developing an e-course takes time, usually more time than planned, then all universities answered to question "What are the main obstacles in developing e-learning?" that lack of time of the teaching staff is one of the main obstacles. As teachers are evaluated mainly by research results in majority of universities, then time needed to develop innovative ways to teach students has to wait or to be done using personal spare time. Here all kind of help (materials, personal help from educational technologist etc.) will expand the time span needed and make development of e-courses possible.

It is not easy to convince teaching staff that the time spent on e-learning materials is worth it in pedagogical and career terms. From here the suggestion arises – evaluation scheme for teaching staff has to include the results achieved in developing e-learning.

Pedagogical skills of teaching staff have been acclaimed not to be very important in many cases of traditional face to face learning situations. Lack of pedagogical skills will be vital in flexible learning situation where part of the learning is ICT-based. It takes time before people discover and acknowledge the lack of instructional design skills and lack of experience to organize learning process in web-based learning environment. Steps have to be taken to anticipate this situation, before it discredits the e-learning for students.

In many universities teachers claim that system of counting workload in e-learning is an increasing problem. And this problem has to be solved at the university level. Many universities are trying to deal with it already. For example this will be one of the themes discussed in Estonian e-University's annual conference in March 2005.

Problems with organizational regulations are mentioned in many answers. All those problems are solvable only at the university level and the solution will be easier to achieve with the help of a consortium.

Suggestions

In this part of our study we will try to give some advice based on the results of our open interviews.

1. *To develop SIS in accordance to LMS.* Usually LMS is a commercial product, SIS is developed (at least partly) within the university as educational management is historically very different in different universities. SIS has to take into account the existence of LMS. As the latter has well defined standardized input and output, the collaboration of the two has to be taken into account as early as possible.
2. *To organize common portal for consortium.* Consortium has to develop a common portal to promote courses for different consortium members – e-learning makes it possible for students from different universities to choose courses at another university. In Estonian case – the law has allowed it already for many years, but as procedures are not so easy, very few students really managed to do it until the creation of the consortium.
3. *To choose common LMS for the consortium.* It makes life easier when all members of the consortium use one and the same LMS for all members. But sometimes it is not so – faculties with special needs for example for special simulation software or with a tradition to use home made system exist. This is a possible solution when standards of export/import are followed, so that courses are potentially ready to be transferred from one system to another.
4. *Take into account scaling possibility.* When already 10% of all courses have e-learning support and organizational means exists – universities have to be technically ready for a scaling jump in e-learning activities – with number of staff being ready to use audio-video tools to enhance the learning process and the situation of rapid growth of the number of courses will destabilize the load of hardware and software. E-learning can function only when it functions technically smoothly.
5. *Life long learning of teaching staff is a very vital question.* For the further development of e-learning, staff development has to be intensified. Just now in a major part of universities under our study, few separate courses exist for teaching staff. It would be good to develop systematic multilevel course system which is open to all teaching and supporting staff.

6. *Combine technical and pedagogical side in courses.* As every separate course has to be small in amount (time is the most critical resource of the target group), it has to contain both technical and pedagogical side. Courses built on new technological basis have to contain incremental part of new pedagogical ideas how to use those new technical tools effectively, as the need for pedagogical courses is not acknowledged.
7. *Consortium based courses bring collaboration.* It would be a good idea to organize consortium based courses – it develops collaboration between universities, is good for promoting best practice and exchange experience between universities in the region.

Future of the study

The aim of the UNIVe project is to develop a model of a small state e-university and on a basis of this study we will suggest ways how to organize staff training and support inside the national consortium.

In [1] main obstacles to collaborative e-learning projects, a divergent national system was seen. As consortia have started to support international subject based people networks, the experience gathered inside the national consortium may widen and support international collaboration.

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DIGITAL LITERACY AND NEW TEACHING SKILLS FOR UNIVERSITY LECTURERS GOING ONLINE

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A big challenge for a small institution

What are the challenges and solutions when a small university department which focuses primarily on lifelong learning sets out to meet some of the central requirements of the Bologna process [1]?

In the autumn of 2003, all higher education in Norway was subject to a thorough reform of higher education, a reform that implements many aspects of the Bologna process. Among the most important issues of this reform were the twin objectives of student focused teaching [2] and formative assessment. In other words, the reform wanted the learning of the student, not the teaching of the lecturer to be the primary focus. And this learning was to be facilitated by formative assessment – feedback on important learning objectives throughout the course.

This article will take a look at how the challenge of this process was handled at AKS (Avdeling for kompetansehevende studier – Department for Continuing and Distance Education) at the Faculty of Theology at the University of Oslo. Specifically, you will see how we worked to impart the necessary new teaching skills to the lecturers, and raise their level of digital literacy.

A Quantum Leap

The new priorities of the reform required a focused effort by the lecturers and the administrative staff in order to bring about quite a few major changes in a relatively short time. The subject of this presentation will be the practical consequences of including formative assessment into the teaching. This required something of a quantum leap: From only one assessment at the end of each course, each student was now to be given formative assessment throughout the entire course.

So, in a course with 100 students, was the lecturer to invite each student into his office for a conversation? This was obviously not the solution. Online support and dialogue was considered a natural alternative. But what would be the best way to make the transition and ensure optimum quality?

At the eve of this huge reform, the Department for Continuing and Distance Education had about 200 students, five part-time lecturers and an administrative staff of one. This department was the only part of the faculty that had any previous experience with online education. This experience told them that creating online support and dialogue for all students would be a tremendous challenge.

So they initiated a pilot project a year before the implementation of the reform to try out on a small scale what this would eventually mean for the faculty as a whole. A Master program in professional ethics for nurses and social workers was planned. This adult education Master was to be flexible in structure with the opportunity for part time or distance learning facilitated by online I would coordinate this work.

New Tricks for Old Dogs

The aim was to use ICT (information and communication technology) in the teaching and evaluation processes in such a way that the technology did not stand in the way of the learning objectives. This approach was intended to secure a genuine dialogue between lecturers and students so that the ICT resources became serviceable and pedagogical tools.

As visions go, this was a positive, precise, and practical one. But long before the first course of this new Master degree ever started, the team was aware of a set of potential challenges:

- A need for new skills:
  - There are significant pedagogical differences between teaching in a regular classroom and an online learning environment [3].
  - The step from one weekly lecture to continuous teacher-student dialogue is a big one. This challenge is especially prominent in the transition period.
  - Online teaching requires higher levels of digital literacy from lecturers as well as students.
- A shortage of resources: Online teaching is often time consuming [4] and the lecturers are already pressed for time.
- A problem of motivation: When implementing an extensive reform, there are a number of changes to be implemented and both lecturers and students can get weary.

And then, of course, there is the old proverb that says: "You can't teach an old dog new tricks". In this case we had no choice. The professors teaching the new flexible master degree – and eventually all of our lecturers – had to go through this transition.

Instructional Webspace Designer

We were aware that universities offering online courses usually have designated instructional webspace designers. This is, of course, an ideal solution, but one that was not available to us.

Unfortunately, the resources were simply not sufficient. I had been hired by the faculty to coordinate the flexible pilot Master program in professional ethics. With a background from pedagogy and theology and with a broad experience from web design and Internet information dissemination, I had the right qualifications, but I had too many other assignments to be able to do the job.

First steps to impart new skills

Instead, workshops were arranged for the lecturers, not only those who would be teaching the new flexible Master degree, but all of the professors and tutors of the faculty. They would all eventually be required to give online support for their courses, so they were invited to learn how to use the LMS (learning management system) and to introduce them to the basic principles of teaching online.

However, as the reform of higher education was drawing closer, there was a wide array of seminars, workshops, and colloquiums on offer and many felt they simply did not have the time for another one. Workshops were clearly not the answer.

As an alternative to the workshops each lecturer was offered a couple of one-on-one sessions to get to know the LMS and to get pedagogical advice for teaching online. But it was soon obvious that this would not be sufficient, either.

Many of the lecturers lacked the sufficient computer skills to navigate the LMS. Some were confused by all the implications of the reform and only a couple seemed to be able to bring their teaching online after the one-on-one sessions.

Online Toolbox for E-learning

So how could we proceed in order to enable our lecturers to fulfil the demands of the reform and ensure student focused learning and formative assessment through online support? A decision was made to move on along two lines:

- The continuous implementation of short one-on-one sessions when needed.
- The development of an online toolbox for e-learning.

The toolbox was designed as a web portal. It was kept simple so that it would not demand a high degree of digital literacy. Rather, it was meant to be a place where digital literacy could be acquired.

The number of elements of the portal was kept relatively low so that it would not be overwhelming. Each part of the portal was designed to be as precise as possible and always practical-pedagogical in orientation. In this way, we would be able to deliver “snippets of learning”, easy to absorb and available around the clock, in order to accommodate busy lecturers.

The elements of the online toolbox were:

- Reasons for e-learning. A short explanation of the benefit of e-learning and how it facilitates the goals of the reform.
- Technical tools for teaching online: audio, video, conferencing, forum discussions, chats, and slide shows.
- Pedagogical tools for teaching online: reviews of articles, books, movies and concerts, student critique, teacher critique, tests, tutorials, group work, brain storming or case based discussions.
- Information on how to write texts for online use.
- Information on online case based teaching: How to use texts, art and photos to encourage students to engage in scholarly discussions.
- LMS tips and hints.
- Reviews of books on e-learning.
- A teach yourself to teach online section, including a short introduction to teaching online.
- Online discussions on some of the pitfalls of online communication and how to avoid them.

The online toolbox for e-learning was launched in time for the introduction of the reform in the autumn of 2003. It was the result of a small project in a tiny department but it soon became a resource for all of the lecturers at the Faculty of Theology.

One year later

One year later University of Oslo is still working on implementing the reform. Only two out of eight faculties have designated people on a faculty level to facilitate e-learning.

Even though e-learning is a priority and is receiving special funding from the University administration, no instructional webspace designers have been employed. The task of adapting teaching material for online use is left to the lecturers.

As a result, the number of courses that have online support is still relatively low and an important objective of the reform remains to be fulfilled.

The Faculty of Theology is one of the university units that have had extensive use of online support for courses. The strategy of short one-on-one support sessions combined with a suite of help tools in the online toolbox seems to enable the lecturers to acquire the digital literacy and the new teaching skills needed for teaching online.

A New Portal for Online Pedagogy

Looking for ways to facilitate e-learning with the limited resources available, the university administration made some funds available for projects that would try out new solutions. In the Department for Continuing and Distance Education at the Faculty of Theology the small team behind the online toolbox for e-learning was asked to design a larger set of tools: a portal for online pedagogy. This time the finished tools were to be made available for the whole university. The project period was from June 2004 to February 2005.

This was hoped to be a way to meet the challenges of skills, resources and motivation mentioned above: Readily available, practically oriented, bite sized pieces of teaching skills and digital literacy.

The new portal would include improved versions of the tools already available in the online toolbox for e-learning. In addition, it was expanded with the following resources:

- A digital cookbook for LMS. A short and simple manual in pdf format to be used as an introduction or to refer to when in doubt.
- LMS course pages with general resources so that lecturers can cut and paste when preparing their own courses.
- Advanced LMS tips and tricks.
- A short introduction to using online discussion forums.
- Practical tips for using forums in teaching.
- How to search the net for material suitable for teaching.
- Link bank of quality tested scholarly web links.

The portal was launched in late February 2005 [6] and at the time of writing it is too early to say if the new portal will be as beneficial to the University as the online toolbox was to the Faculty of Theology.

Solutions

E-learning and online support for teaching is a vogue in Norway right now, as it is in many other European countries. Norway is well equipped for this kind of teaching, as we have one of the world's highest ratios of computers per inhabitant and of Internet access [7 a + b]. So the infrastructure for e-learning is present.

There is much to be gained from well planned and professionally executed e-learning and from online support for classroom education. But if the lecturers are not trained to teach online or do not receive the support they need, e-learning becomes a stumbling block. It will be too time consuming for the lecturers and if the job of adjusting the teaching material for use online is not properly done, the experience will be confusing for the students.

In order to take advantage of the benefits of e-learning, it is important that technical and pedagogical support is available. At last year's EDEN Conference, Corrine Bossé from Athabasca University in Canada described their system of instructional design teams with technicians, educationalists and web designers who work together [9].

A solution like this is optimal, but it is not an option available to all. However, e-learning without some degree of technical and pedagogical support is a waste of time and money. It is possible that for highly motivated lecturers, a system with online help for the novice and the adept alike, and with some degree of personal support, might be a way to go.

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PROFESSIONAL DEVELOPMENT FOR EGYPTIAN TEACHERS AND THE CHALLENGES FOR INTEGRATING E-LEARNING

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Abstract

E-learning is considered to be a 'powerful' tool that provides rich resources of information and cognitive tools which support the learner's construction of knowledge. The Ministry of Education in Egypt launched a recent e-learning project that aims to provide both teachers and pupils with rich information resources available on the Internet. However, there are some cultural and educational challenges that face the integration of e-learning in Egypt. Subsequently, this study investigates the teachers' views about the obstacles that they encounter during the use of the Internet in schools. This study reveals some educational barriers such as the common 'traditional' approach used by teachers and its influence on the 'successful' integration of e-learning. It also identifies the cultural barriers to e-learning e.g. the social perspective of the teacher's role and the influence of language on the use of e-learning.

Introduction

There is a growing debate these days about the integration of the Web in teaching and learning in different contexts and across different subjects. However, the current view to integration is seen to be rather narrow, because it mainly focuses on supplementing 'traditional' teaching practices with the Web seen as a supplementary element. While the Web-based learning is considered to be a hypermedia-based instructional program which utilises the attributes and resources of the Web to create a meaningful learning environment where learning is fostered and supported (Bannan-Ritland et al., 1998). Berge (1999) also defines Web-based learning as a technology system that has given features and capabilities such as hypermedia and tools such as email, Web-based computer conferencing, and/or synchronous chat. In this study, and in fact, the Web is seen to be as a rich resource of information in all our domains of life. It also provides search tools for finding out information. The Web also provides a wide range for synchronous communication tools e.g. computer conferencing, instant messaging etc. and asynchronous communication tools e.g. email, discussion boards etc. that can be used to facilitate communication between people online. Subsequently, e-learning can be viewed as:

> *"a learning environment that make use of electronic information resources, information search tool, electronic communication tools, and all the technical facilities available on the Internet for the facilitation of the teaching and learning processes by enabling teachers to integrate these with their current practices and encourage the students to use them to construct their own knowledge."*

This view is based on the various constructivist assumptions of learning and in particular it is based on Jonassen's (1999) model of constructivist learning environments, which highlights the role of information resources, cognitive tools, conversational and collaboration tools in the construction of learners' knowledge.

This paper highlights the Egyptian e-learning project, which is a recent project launched by the Ministry of Education in Egypt. It also examines the use of the Internet in schools in Egypt from a constructivist view of learning. Accordingly, it investigates the barriers that face the 'successful' integration of the Internet in classrooms. Subsequently, it identifies the educational barriers that face the use of the Internet and in particular the common pedagogies used in the Egyptian schools.

Furthermore, it brings to light the cultural barriers that prevent teachers from the effective use of the Internet in schools such as the language barrier and the difficulty that teachers face to change their role in classroom to become the role of a facilitator who can support and guide students' interaction and discussion online.

Egypt's E-Learning Project

Egypt is considered to be one of the largest countries in the Middle East and in Africa with an increasing population of around 70 million people who are living in less than 4% of its landscape, which is about 1 million square kilometres. As a consequence, most inhabited areas in Egypt are considered to be highly residential which led to a number of problems that influenced the country economic, social and educational systems. For instant, there are several key difficulties that face the education system in Egypt such as the increased number of population and its influence on increasing the demand for education. This increasing demand for education led to an increasing number of students in schools. Subsequently, there is a need for more qualified teachers, in addition to the lack of resources and the weak infrastructure. These problems are seen as barriers to use and integrate ICT in Egyptian schools, which is considered by the Ministry of Education as an important element to reform education. The director of the Technological Development Centre, which is based in the Ministry of Education in Cairo refers to these problems as follows:

> *"We faced many problems when we start to use educational technology in order to reform education. These problems include: the lack of qualified teachers who are prepared to use and integrate new technologies in schools, the weak infrastructure which are required for using educational technologies, the lack of financial resources and the lack of knowledge of this approach."* (Zamzam, 2001, 165)

The reform policy in Egypt aims to tackle the major problems the education system is facing. For example, in the last two decades, the Ministry of education established new schools to accommodate the increasing numbers of students. In line with the development in the infrastructure for education in Egypt, the Ministry of Education also established the Technological Development Centre (TDC) which launched a technological development project in 1995. This project aims to develop, integrate and use information and communication technologies in education in Egypt. Within this project, the TDC designs multimedia programmes for several subjects, and it connected the majority of schools to the Internet. Within this large scale project, more than 35000 schools were connected to the Internet across the country (the Ministry of Education, 2004). Although some of these schools are connected through leased-lines Internet connections, the majority of schools are connected through dial-up 'slow' connections.

The Egyptian Ministry of Education (2003) considers the use of e-learning as one of the national goals for education in Egypt. As a consequence, the Ministry of Education launched the e-learning project in 2002. This project is part of the national project for establishing an Egyptian e-government in order to enable Egypt to join the development vehicle in this field.

The e-learning project began with prep-schools (for pupils aged 12-15) in order to provide both teachers and pupils with rich information resources which are available on the Internet and the Ministry of Education Intranet. According to the recent statistics of the Ministry of Education (2004), 7700 prep-school were connected to the Internet in order to enable them to use e-learning. It also uploaded 22 different national curricula materials and 55 educational games on the Ministry of Education's Intranet server. The Ministry is also preparing a project for transmitting video programmes such as these prepared by the Egyptian Television and the recorded programmes of the National Network for Distance Training for teachers. These programmes are planned to be uploaded on the server to be viewed by the users in schools (on-demand) (Ministry of Education, 2003).

Study Results

A survey was designed to investigate the teachers' use of the Internet in prep-schools in Egypt. The survey included 88 teachers from different subjects such as math, science, Arabic language, English language etc. The results of this survey show that only 17 teachers (19% of the sample) use the Internet, while 81% of teachers do not know how to use the Internet. This is seen to be as a result of the lack of training on the use of the Internet. For instant, 12 teachers out of 88 received a training course on the use of the Internet. These training courses are usually organised by the Ministry of Education, Technological Development Centre. The majority of them did not feel that the training they received is sufficient and enough either because the training period was very short and/or the quality of the training is not good enough. This case is not only in Egypt but also in other developing countries such as Malaysia (Mohaiadin, 1997) and Macao (Shezhang, 1998). These studies found that there is a lack of knowledge and skills in using the Internet among teachers, and the use of the Internet has been typically learned through friends rather than through formal curriculum or instruction.

Educational Barriers

As highlighted early in this paper, one of the main difficulties that education faces in Egypt is the lack of qualified teachers who are able to use new technologies effectively. This is seen to be as a result of the increasing number of students in schools who require more teachers. This increasing number of students influenced the capacity of the classrooms in the majority of schools. This in turn increases the workload and the pressure on teachers. Accordingly, the teachers' use of the new technologies and specifically the Internet is influenced by this workload. For example, this study revealed that 37% teachers do not have time to learn the use of the Internet because of the workload. Furthermore, 20% of teachers mention that they did not try to learn to use the Internet because there is no any kind of reward (e.g. financial, promotional etc.) for using the Internet in schools. In addition, 22% of teachers mention that they did not try to learn to use the Internet because they are unable to use the computer. This raises the issue of teachers' professional development and the teachers' lack of competency to use ICT. Teacher training is seen by Krajka (2002) as a challenge for using online learning. According to him, this challenge comes from the fact that pre-service institutions are seen to provide neither sufficient facilities nor training, while in-service training may be less effective and more exhausting for trainees. This refers to the teachers' education institutions in Egypt and their role in preparing teachers to use ICT in their own subjects. It would be worthy to mention that the Ministry of Higher Education in Egypt has now a large scale project to develop the teacher education institutions around the country.

This also might be as a result of the fact that the ICT subject was not introduced to the majority of teacher education institutions several years ago. As a consequence, the current in-service teachers are unable to use ICT. Although a few number of teachers received training on the use of the Internet, training is still the main source for learning the use of the Internet according to teachers' views (Table 1).

Table 1: shows the teachers' sources for learning the use of the Internet

The learning method	Via a training Course	Via a friend	Via personal readings	Via trial and error
The number of teachers	6	5	3	3

This highlights the importance of the training in developing teachers' professional knowledge and particularly in relation to ICT and the Internet. The majority of teachers who use the Internet indicate that they usually access the Internet in schools rather than other places such as home and Internet cafes. This draws the attention to the role of schools in Egypt in providing access to technology for teacher.

Fetherston (2001) highlights the potential of the Web to assist teachers who wish to change their pedagogy. He draws the attention to an important challenge that faces teachers who are using the Web. This comes from the various media that can be used via the Web and the many kinds of possible interactions. Therefore, the challenge, which is faced by teachers themselves, is to find good pedagogical practices that will build on the inherently motivating nature of the Web and produce engagement that will lead to good learning. Although e-learning is a powerful adjunct to traditional modes of delivery (Beer *et al.* 2002), according to the teachers' views, the main purpose for using the Internet in schools is searching and browsing the Internet for information. Only 3 teachers indicate that they use emails. While only 4 teachers out of 17 uses the Internet in teaching their own subjects. None of the teachers use videoconferencing and discussion forums available on the Internet. These results bring to light the teachers' need for more training on the integration of the Internet in schools. This also indicates that teachers are stick to their current pedagogy (mainly lecture) and they do not integrate other pedagogies suitable for the Internet. Okamoto *et al.* (2001) refer to the need to integrate different pedagogical strategies in order to adapt to the students' characteristics. They note that offering adapted activities, producing appropriate feedback, favouring communication between students and offering assistance are crucial.

Teachers refer to some obstacles that prevent them from the effective use of the Internet in schools, these obstacles can be summarised in the following:

- The speed of the Internet connections in schools is very slow and frustrating.
- There is no enough number of computers connected to the Internet in schools that enable teachers from integrating the Internet in teaching and learning.
- The lack of sufficient training in-schools on the use of the Internet.
- The workload and particularly the increasing teaching hours that teachers have during the school day.
- The lack of reward that promotes teachers to use the Internet in schools.
- The lack of inspection and review that ensure the teachers' effective use of the Internet.

The teachers also provide some suggestions in order to improve the use of the Internet in schools such as:

- Providing schools with sufficient number of computers connected to the Internet and enabling teachers to access these at anytime.
- Creating a balance between the teachers' workload and the extra curricula activities in order to encourage them to integrate the Internet in teaching and learning.
- Arranging and providing training courses for teachers on the use of the Internet in schools, local education authorities and the Ministry of Education.
- Careful planning of the training courses in order to provide teachers with the essential skills and knowledge which are necessary for the effective integration of the Internet in schools.

According to Stacey (2002), the 'success' of e-learning lies in the hands of the teacher who 'facilitates' the process. He also emphasises that the facilitator's role in developing a secure learning and development environment, modelling social presence factors and continuing to monitor and facilitate conference/discussion interaction is a major factor in the success of this interactive process in online learning. Thomas *et al.* (1998) also highlight that effective integration of new technology requires an understanding of the whole education process and a critical examination of its functions. On one hand, the innovation must be integrated with existing practice. On the other hand, we must seek to improve practice rather than simply translate it. In order to integrate the Web effectively in Egypt many factors should be taken into consideration such as improving teacher training, integrating a number of teaching strategies, accommodating students' preferred learning styles and maximising the use of the various technologies available on the Web e.g. communication tools, search tools, information resources etc.

Cultural Barriers

For several years and like many other countries around the globe, the behaviourist perspective to learning is the common approach. In Egypt, this approach is commonly used and it influenced the view to teachers and learning. For example, teachers are seen to be the main 'power' and the main responsible for students' learning in the education system in Egypt. Accordingly, teachers play the key role in the teaching and learning process in schools. Both parents and students view teachers as the main source of knowledge that represents the subject knowledge. Subsequently, they expect teachers to 'stand' and teach all the time in order to enable students to understand all aspects of the subject. This view affected the students' role in learning by becoming passive receivers of information. These roles neither give the learners the opportunity to actively engage in the learning process nor support the development of their higher cognitive abilities such as analysing, synthesising and integrating knowledge in new situations. These views reflect the culture that influence learning in Egypt, and the term 'culture' can be identified as the commonly shared system of general beliefs, values, and underlying assumptions held by a group of people (Chase *et al.,* 2002). The Ministry of education reform efforts aim to change this view to the teachers' role to enable him/her to play multiple roles in the students' learning such as facilitator and guide to learning. Therefore, it aims to use ICT and e-learning to enable the students to actively engage in the learning process.

The current framework that is seen to underpin the global use of e-learning is seen to be the constructivist approach. Within this approach, the Web is considered to be a cognitive tool that teachers can use in a variety of ways (Reeves, 1999). For example, teachers can use the Web to enrich access to course materials; document course discussions; post student writing, art, projects, etc. for critique; provide tutorials, simulations, and drills and facilitate group work. However, the current use of e-learning by the Ministry of Education is still more influenced by the behaviourist approach, which is still the culture of teaching and learning in Egypt. For example, the Technological Development Centre (TDC), which is based at the Ministry of Education in Cairo, is using a video streaming system in order to provide schools with real-time presentations by experienced teachers according to a pre-defined timetable by the centre. This system reflects the fact that the view to teacher as the main responsible for students' learning remains the same. It also illustrates how the learning culture influences the design and the use of e-learning. This is becoming known as 'cyberculture' which, according to Chase *et al.* (2002), reflects the values of its developers. Therefore, this learning culture is seen to be a barrier to the 'successful' integration of the Web in teaching and learning. As a result, this culture needs to be dealt with very carefully by changing it gradually through continuous training in order to avoid any resistance from people (teachers, students, parents). For instant, 13 teachers (15% of the total included in the survey) refused to participate in training courses, which they were offered to learn the use of the Internet. Furthermore, 8% of the teachers who do not use the Internet in schools are not convinced of its importance to education. This indicates that there is a small percentage of teachers who already resist the change and professional development. Although this percentage is relatively small, it should be taken into account when planning to integrate new technologies in education. Therefore, teachers should be encouraged to use new technologies using a systematic approach of reward that is built on their continuing efforts for professional development. Language is also seen to be an important element of any culture. The main language in Egypt is Arabic, which is difficult to use on the Web because of its standards.

In a study made by Al-Badr (1998), he finds that the major obstacle that faces the use of the Arabic language on the Internet is the lack of standards, particularly in the field of character sets. He also summarises the problems that are facing Arabic-speaking Internet users which are weak telecommunication infrastructure, lack of Arabic content on the Internet and lack of Arabic Internet access software for the Web and for e-mail. In addition, there is a lack of Arabic e-learning software that can be used in Arabic countries. According to this research, teachers identified some obstacles that prevent them from the effective use of the Internet in schools. Among these obstacles, they refer to the difficulty that faces both teachers and students in browsing Websites in English language. Therefore, more efforts and resources need to be allocated by the Arabic countries in order to standardise and increase the use of the Arabic language on the Web.

Conclusion

In order to use e-learning effectively, it should be integrated with the current practice. Therefore, the 'successful' integration of e-learning in Egypt should take into account the different cultural and educational settings in which learning takes place. The following Figure 1 suggests a model for the integration of technology (e.g. Web) in teaching and learning.

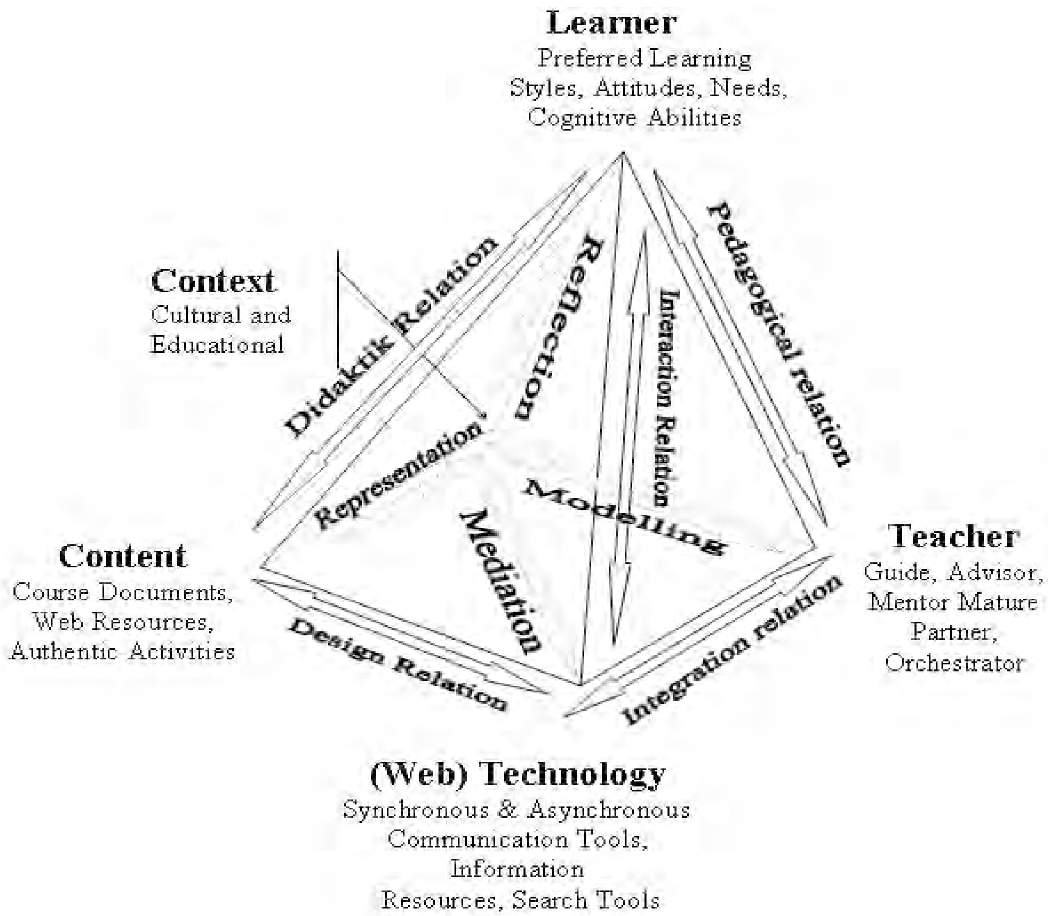

Figure 1. Integrated Teaching and Learning Environments (ITLE): A Holistic Relational Approach

According to this model, technology (including the Web) should be regarded as an important and necessary element in teaching and learning. Subsequently, the technology needs to be designed in the light of the cultural and educational context. In the Egyptian educational culture, the teacher is considered to be the main source of subject knowledge and therefore, he/she mainly plays the role of 'lecturer'. However, and as shown in the above figure, the teacher needs to play multiple roles such as guide, facilitator and mentor in order to facilitate and promote the students' online discussion (El-Gamal, 2002). As a consequence, the teacher would not rely only on 'lecture' as the main pedagogy, but he/she will integrate various pedagogies such as discussion groups, problem solving, activities etc. in order to encourage the students to play an active role in the learning process. In addition, the use of various pedagogies should aim to accommodate the preferred learning styles of the students. The information resources and cognitive tools that are offered by the Web should be used in order to enable the students to develop higher levels of learning such as analysing, synthesising, evaluating etc and hence develop their creative and critical thinking. In order to enable the teacher to play these roles and integrate e-learning effectively, he/she needs to be trained on the different capabilities offered by the Web and the various pedagogies for using them. Therefore, continuous training courses should be organised for teachers whether in-schools or in the local Technological Development Centres at each governorate in Egypt. These training courses should also be based on the analysis of the teachers' actual needs and should be related to their own interests. Furthermore, teacher education institutions in

Egypt should have the facilities needed to prepare teachers to use new technologies such as the Internet. In addition, the Ministry of Education alongside with the different sectors of the Egyptian society should collaborate to establish more Websites using the Arabic language that can be used by both the teachers and the students in schools via the Internet. Finally, practical issues such as the infrastructure required for the effective use of the Internet should be taken into account by enhancing and developing the number of PCs connected to the Internet in each school.

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THE OPINTOLUOTSI-PORTAL: HOW TO PROVIDE COMPREHENSIVE AND COMPARABLE INFORMATION ON ALL EDUCATION AND TRAINING OPPORTUNITIES?

Susanna Gardemeister and the Opintoluotsi-team, University of Helsinki, Palmenia Centre for Continuing Education, Finland

Abstract

The Opintoluotsi project was initiated in 2000 by the Ministry of Education and coordinated by the University of Helsinki, Palmenia centre for Continuing Education. The main objective of Opintoluotsi.fi is to help everybody to find extensive information on the education and training available in Finland, and by the year 2006 to become the key Portal service for information on education and training in Finland.

First of all, Opintoluotsi.fi is promoting lifelong learning by helping citizens in finding information on education, training and learning opportunities, facilitating individual decision making and study planning. Secondly, Opintoluotsi.fi is promoting access of guidance services by providing one WWW-address information previously scattered over a range of different media. Thirdly, Opintoluotsi.fi is strengthening co-operation among practitioners from the lifelong guidance perspective by promoting cross-sectoral regional form in guidance. Finally, Opintoluotsi.fi is supporting for regional decision making and maintenance of minimum level guidance and counselling services.

1. The Opintoluotsi Project

The Opintoluotsi project was initiated by the Ministry of Education for the period from 2000 to 2006. The project is supported by the European Social Fund, and it is coordinated by the University of Helsinki, Palmenia centre for Continuing Education.

Opintoluotsi aims at helping everybody to find extensive information on the education and training available in Finland.

The services of Opintoluotsi are offered to everybody in Finland looking for information on education and training, whatever their current life situation is. Opintoluotsi's English-language pages have been designed specifically for immigrants and foreigners in Finland.

The Opintoluotsi web pages (www.opintoluotsi.fi) are the main service channel of the project and provide equal opportunities for learning about education and training irrespective of your age, background, position or location.

2. Starting Points

2.1 Changes in the field of education

Education and training are affected by the same changes that have an impact on trends in society as a whole, where many existing structures are crumbling and new structures are taking shape. Schools and degrees are frequently renamed. The relationship between occupations and the education and training leading to them is not what it used to be.

Educational institutions have more and more to say about what sort of education and training they may provide. They also have to ensure their own competitiveness and visibility in the training market.

While educational institutions are increasing their advertising efforts, the information that they provide on the goals, contents and completion of their courses and curricula are not necessarily consistent. They may have changed their names or the names of their courses for marketing reasons, which will add to the confusion.

In fact, lack of information is not the greatest problem facing someone who is looking for training opportunities. In addition to course advertisements published by educational institutions themselves, there is plenty of information available on the Internet and in printed guides.

What makes finding the right information difficult is that the information is scattered over a range of different media and that it is difficult to compare different training options. Until now, it has been impossible to obtain comprehensive information on the various training opportunities and their mutual relationships available from a single source in Finland.

Opintoluotsi.fi is a website that provides such comprehensive information on all education and training available in Finland.

2.2 Lifelong learning

Since the mid-1990s, lifelong learning has been one of the key principles in education and training. Closely connected with the prerequisites for transition to the information society and new economy, it is defined, both in Finland and international fora, as follows:

- The structure of occupations and tasks change at a rapid rate.
- Learning is important throughout people's lives.
- People with different backgrounds should have access to plenty of opportunities for learning.
- It is essential to learn the new set of basic skills required by the information society.
- The information society calls for a wider variety of skills than just those related to computer technology.
- Learning related to hobbies and other interests is also important.
- Constant learning requires literacy and other basic skills.
- Information and guidance must be within everybody's reach.

Implementation of the principle of lifelong learning cannot stop at expanding the supply of education and training or increasing course flexibility. There must also be plenty of accurate and clearly presented information on the various training opportunities. This information should also be presented to different users in an easy and comprehensive form.

Individualism is an essential feature of the information society. It is also increasingly reflected in people's choices of education and training. Many traditional occupations that used to follow a standard training path are disappearing as jobs become more and more specific, calling for a variety of skills and tailor-made training. There are a number of new occupations that are not based on any conventional form of formal training. Accordingly, pursuing studies along one's career or retraining for an entirely different career are becoming more and more important options.

More and more people are studying abroad or doing studies in foreign languages. Courses related to hobbies and other interests are increasingly popular, too. In addition, more and more people remain active after retirement from working life and need training services that meet their own needs.

Opintoluotsi.fi offers an opportunity to view and access all education and training services available, including courses that do not lead to qualifications or directly support career development.

The main task of Opintoluotsi.fi is to present different aspects of education and training and to draw the attention of people whose lifestyles do not, at the moment include any studies.

Opintoluotsi.fi is designed to provide easy access for anyone interested in the education and training available. The main target group for this service is adults looking for information on how to develop themselves, learn new skills and ideas or even change their careers or life situations.

2.3 The Internet as a tool for public service

The Internet is a medium that reaches a wide variety of people in their own familiar surroundings – at home, workplaces, schools or public libraries. The role of the Internet in everyday Finnish life has changed rapidly and today it provides an increasingly popular channel for both public authorities and commercial marketing.

Most people use the Internet either at home or at work. Lately, however, access to the Internet has also been possible at cafés, shops, waiting areas and shopping centres as part of the service concept. There is more and more training on how to use the Internet, even for senior citizens.

The Internet is an excellent opportunity for training service providers as well. Most of the educational institutions in Finland are already offering information on their courses in the Internet; in the future, they are very likely to use their websites as their main medium of communication in this respect.

Opintoluotsi.fi uses the opportunities provided by Internet communication to gather information on the education and training available in Finland. It brings up the information compiled by the educational institutions themselves and guides you to Web services provided jointly by educational institutions and to other websites related to information on education and training.

3. Principles

3.1 Opintoluotsi.fi offers variety

Opintoluotsi.fi is a Web service that provides information on all education and training available:

- diplomas and degrees and the courses leading to them;
- the various forms of additional and further training;
- courses related to hobbies and other interests.

In addition to the courses available, Opintoluotsi.fi provides information on schools and universities, their locations, the terms of admission and the arrangements related to the education and training provided.

In addition to the Finnish-language service and the Swedish version based on it, Opintoluotsi.fi has a web service in English. The site includes for instance information on the study opportunities for non-Finnish speakers in Finland.

Opintoluotsi.fi will not present the information in an exhaustive form. It contains the necessary basic information and supplementary information on issues that are not discussed clearly or adequately enough in other sources. For information on issues that change constantly or require closer study, it provides links to the original sources such as websites of educational institutions.

3.2 Opintoluotsi.fi offers clarity

Opintoluotsi.fi arranges and presents the information on the education and training available in a manner that describes the general rules of education and training systems and any exceptions thereto in plain language. Obviously, there are always some areas that should not be oversimplified or explained too unambiguously. We will not, however, omit any issues that cannot be presented simply nor will we make complex issues seem straightforward.

Opintoluotsi.fi provides the information as it is, without ranking the various courses, placing them in any order of preference, following a specific Government educational policy, or deciding what would be best for the user.

The information in Opintoluotsi.fi is offered in a form that is easy to follow as possible. The Web pages contain unique information that has been compiled in cooperation with experts from a broad range of fields.

The English-language service features a section designed specifically for foreigners and immigrants about studying in Finland, local diplomas and degrees and additional training, as well as ways of learning Finnish. Opintoluotsi.fi also has information on the importance of language skills, how to finance studies and recognition of foreign qualifications. It gives helpful links to those living or studying in Finland or intending to study in Finland on how to find the right authorities.

3.3 Opintoluotsi.fi is designed for browsing

Opintoluotsi.fi is like window-shopping for education and training: you can browse at your leisure.

Opintoluotsi.fi is a tool for making decisions about what you want to study, but you can also use it simply to see what there is available for you, find answers to specific questions, or find general information on any training that you may find interesting. You can browse just to compare the training courses available even if you are not planning to begin studies.

Opintoluotsi.fi includes a comprehensive directory of links to all essential Finnish educational resources on the Web.

4. How the Project is Progressing

Opintoluotsi.fi was launched in April 2002. It is updated and maintained in accordance with constantly revised goals and guidelines. The goal of the project is to make Opintoluotsi.fi the key service for information on education and training in Finland by the end of 2006. By that time, the permanent administration, organization and funding of the project should also be secured. This will require knowledgeable content production, a functional cooperation network, effective communication and marketing, and continuous political will.

With such broad contents and extensive target groups and the aim of offering all information there is on education and training to everybody, we must proceed gradually with regard to the focus areas within content development and Web communication and set specific goals for each year and for shorter periods. Each year, we will focus on specific groups of users and their needs and adjust the presentation of information accordingly.

In addition to the Internet service, Opintoluotsi.fi will apply other tools, such as mobile communications and digital TV. We have already begun design work related to multi-channel solutions. The project will also generate innovations related to the needs of special groups.

4.1 Research

Research is an important part of the development and maintenance of Opintoluotsi.fi. Reports and summaries (in Finnish) related to research carried out at the universities of Helsinki, Oulu and Jyväskylä are published regularly in Opintoluotsi.fi.

4.2 Services for educational institutions

Opintoluotsi.fi includes pages for educational institutions (in Finnish). This service includes information on how institutions can submit information on themselves to Opintoluotsi.fi and about the Internet in general. The better websites they build, the easier it will be for people to find and use relevant information on them.

4.3 Services for guidance and counseling professionals

Opintoluotsi project includes a Web service called www.asiantuntijaluotsi.net for guidance and counselling professionals to support their professional development and mutual cooperation and to give instructions on how to use Opintoluotsi.fi in their work. The content of the service is coordinated by the Institute for Education Research at the University of Jyväskylä.

4.4 Services for citizens

In April 2005 Opintoluotsi.fi will launch a new service model called Guidance Service. The guidance service consists of database of Finnish guidance services and Help Desk. Citizens may search from the database guidance and advice services according to their individual needs. Citizens may also send questions concerning education to Help Desk. Advisors in Opintoluotsi.fi will either answer the question by themselves or redirect questions to some advisor in Opintoluotsi.fi multi-professional network of practitioners.

5. Rewards

Opintoluotsi.fi has been successful in external evaluations. First of all, Opintoluotsi.fi is the best portal in Finland, i.e. Opintoluotsi.fi won The Prime Minister's Best Practice – the quality prize for web services in public administration in November 2004.

The competition was part of The Government Information Society Programme, which included a project creating tools for the evaluation and development of online services (e.g. web services) and rewarding high-quality public online services. The project was set by the Ministry of Finance. According to the project assessment team Opintoluotsi.fi is an outstanding example of high-quality public online service as well as a project. Opintoluotsi.fi is easy to use, providing a variety of information on education in an interesting way. Content is reliable, up-to-date and comprehensive. The project is systematically managed, the content production is controlled and it is beneficial to the users as well as to providers and other organizations.

Secondly, in OECD-Highlights of the Year 2003 Opintoluotsi.fi was mentioned as a good example motivating adults in taking part on education and lifelong learning. Finally, in 2002 Opintoluotsi.fi was recognized by the Finnish Guild of Adult Education as “The Adult Educator of the Year” for enhancing adults in finding educational information in the Internet.

6. Summary

This paper has presented the main objectives of the Opintoluotsi project and the Opintoluotsi.fi web service. Opintoluotsi.fi service is based on the principle of lifelong learning and connected with the prerequisites to the information society and new economy. Opintoluotsi.fi is facilitating citizens in finding information on education, training and learning opportunities, promoting access of guidance services, strengthening co-operation among cross-sectoral guidance and supporting regional decision making in guidance and counselling services.

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THE EASTERN FINLAND EDUCATIONAL NETWORK – BIGNET: PROVIDING SUPPORT TO E-LEARNING AND E-TEACHING FOR SECONDARY EDUCATION

Anu Wulff, Leena Suonio and Eila Kaijärvi-Pekkola, The Eastern Finland Educational Network and Anni Virnes, The Eastern Finland Distance Learning Network, Finland

Introduction

In this paper we describe some activities and preliminary results of an ESR funded project "Itäsuomalainen oppimisverkosto 2004-2006" (The Eastern Finland Educational Network 2004-2006), later referred as BIGnet Project. This regional project is a continuation of two previous smaller-scale regional projects (Figure 1). There was a general agreement that the operational model and the experience gained in the Eastern Finland Distance Learning Network were worth putting to a wider use.

The main goals of this project are 1) to support (small) secondary education institutes in the area, 2) to increase co-operation and collaboration among eastern Finland secondary education teachers, 3) to provide flexible and high-quality educational services in Eastern Finland, and 4) to support teachers in adapting to a new operational culture. Geographically large area and high number of institutes involved makes the project challenging both in pedagogical and administrative terms.

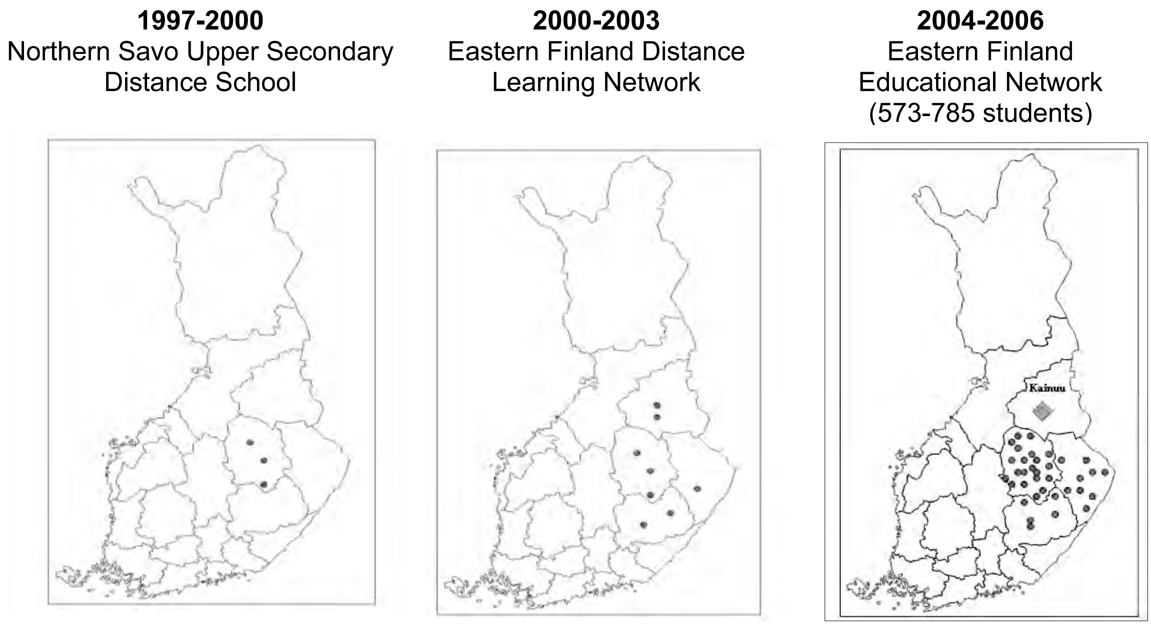


Figure 1. Eastern Finland Educational Network 2004-2006 (BIGnet) extends, develops and distributes best-practice activities of two previous projects

Project Description

Detailed goals of the project:

1. Supporting (small) upper secondary schools:
    - combining existing co-operational networks and starting new co-operation;
    - strengthening the expertise of each school;
    - sharing expertise of individual schools for the benefit of the expanded network;
    - gathering and providing versatile syllabus.

2. Establishing a permanent model for Eastern Finland Educational Network:
   - constructing web pages and web-based services (delivery of online courses, and tools for content production and learning object recycling) for the BIGnet Project;
   - establishing organisational and financial models that support innovation and networking;
   - further pedagogical development of online courses with special regard to quality matters;
   - establishing regional networking models and pedagogical networks to further develop networked education, training and guidance activities.
3. Providing individual, flexible and regionally covering educational services for all kinds of learners:
   - gathering and offering online courses by a centralised system;
   - further development of distance education;
   - enhancing working life skills and facilities for continuing studies by increasing co-operation among secondary education institutes.
4. Supporting adaptation to new concept of teaching and changing operational culture:
   - providing further education and in-service training for teachers;
   - constructing interaction between universities and upper secondary education by e.g. familiarizing new teachers with e-learning and networking.

The values and keywords best describing this project are networking, co-operation, collaboration, transparency and innovative use of ICT (Information and Communication Technology) in secondary education. The institutions participating in this project are described in Figure 2. Over 40 secondary education institutes involved comprise about 500 teachers and 8000 students. In addition, two institutes providing vocational education participate in the project. The geographically large area has been divided into four sub-areas (Figure 3).

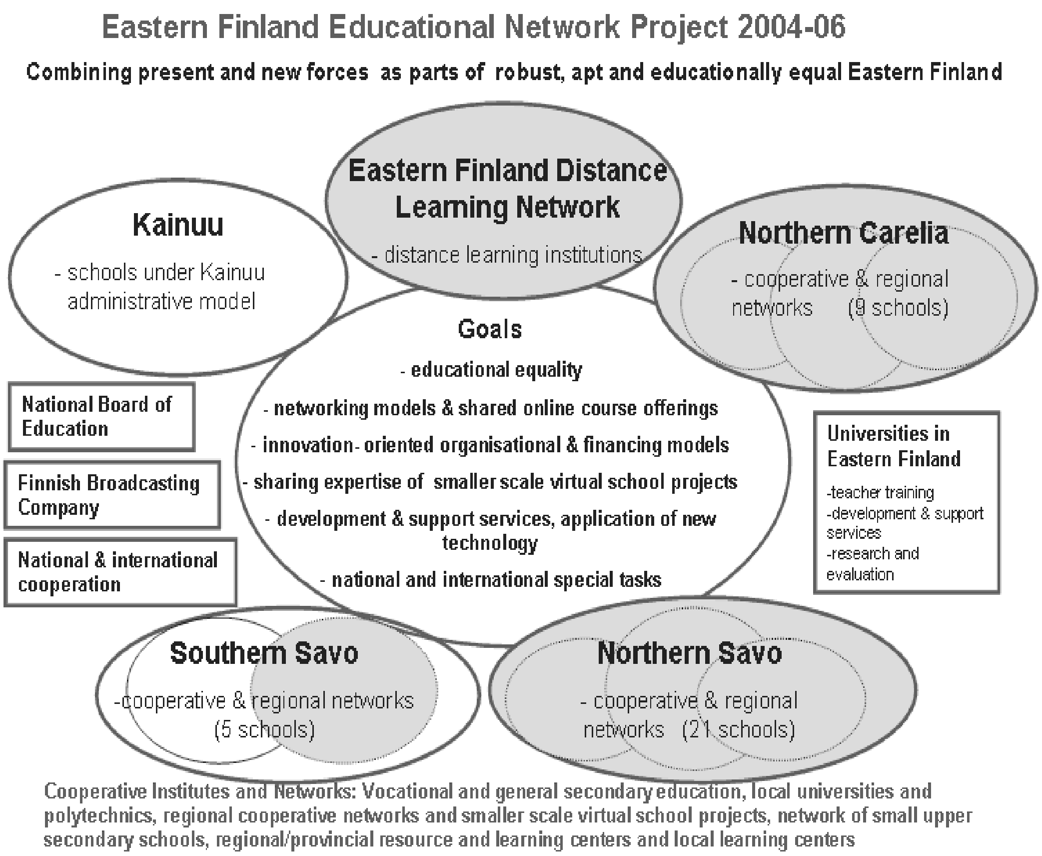
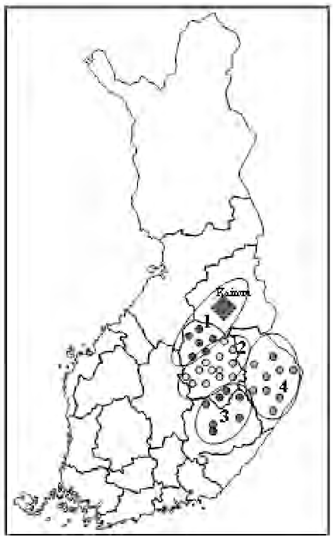


Figure 2. Participants in the BIGnet Project

In order to achieve our goals, we emphasise on establishing collegial networks between principals, teachers, guidance staff and ICT personnel (Figure 3). In each sub-area, each regional network has its own group leader(s) whose task is to initialise and promote activity locally and regionally in collaboration with other group leaders. Pedagogical group leaders are also responsible for evaluating the learning objects collected to Content Pool for shared use.



Groups/Teams	Sub-area 1	Sub-area 2	Sub-area 3	Sub-area 4
Principals	3 Group Leaders	3 Group Leaders	2 Group Leaders	2 Group Leaders
Guidance personnel	1 Group Leader	2 Group Leaders	2 Group Leaders	2 Group Leaders
ICT personnel	2 Group Leaders	2 Group Leaders	2 Group Leaders	2 Group Leaders
Five Subject Specific Groups (Teachers)	2 Group Leaders	8 Group Leaders	4 Group Leaders	3 Group Leaders
Producers	Group of about 20 persons representing all sub-areas			
Developers	Group of about 15 persons representing all sub-areas			
Entrepreneur Education	Planning Team of about 10 persons representing all sub-areas Group Leaders promote and develop activities and collaboration in their own sub-areas and in the whole project, and evaluate web-based learning objects			

Figure 3. Geographically large area has been divided into four sub-areas, and to several task or subject related groups within the BIGnet Project

A summary of project activities, achievements in 2004 and final goals is described in Table 1. Project maintains own web page (http://www.isoverkosto.fi) that is used for sharing general information both internally and externally. As an online learning and communication environment we use Moodle (http://isoverkosto.moodle.fi). Currently, about 1000 usernames and about 400 courses have been set up in the BIGnet Moodle environment.

Table 1: Activities, Tools and Goals of the BIGnet Project in 2004-2006

Project Activities	Achievements in 2004	Goal in 2006
Networking	Network organised, groups and group leaders for e.g. principals, teachers, guidance personnel and ICT staff established, groups have own Moodle environments	Permanent functional model for network
Online Environments	Project web pages constructed, Moodle taken into use, development of recycling centre/content pool for learning objects started	Functional tools for communication, and for sharing information, learning objects and online courses
Course Offering/Availability	Course registration and delivery system established, 103 online courses (chargeable) and 11 Training Online Courses (free of charge) provided	Versatile syllabus, models for delivery and guidance, economical models
Content Production	Basic models for content production constructed, 10 template online courses and appr. 500 learning objects for shared use delivered, metadata classification determined, development of metadata editor and user interface for recycling learning objects begun	High quality educational learning material, permanent model for collecting and using learning objects in the Content Pool
Teacher Training	New teacher training model developed (local teacher and guiding online teacher working in co-operation), various short-term educational events carried out	Model for teacher training
Evaluation and Quality	Guides and models, web-based questionnaires, tool for evaluating online courses and course description template constructed	Quality thinking and high quality practices
Information Sharing	Project logos and general forms constructed, information shared via web pages, e-mail and Moodle	Transparency, up-to-date sharing of information

Sharing Expertise by Gathering Learning Objects for a Recycling Centre/Content Pool

Sharing and reusing online resources offers a sustainable approach to e-teaching (e.g. Ilomäki et al. 2004). Teachers use more and more ICT in their preparation and actual teaching. Increase in the number of internet connections at homes enables and induces also web-based teaching and learning. In this project we have developed a so-called Content Pool, or Recycling Centre, where we collect and store platform independent learning objects produced by individual (high school) teachers in our network. A basic technical system has been developed and runs in a Nexus environment (http://pooli.isoverkosto.fi/fi/pooli/). Metadata determinations, based on Dublin Core system, were completed in 2004. All learning objects are classified by filling in metadata information to every single object. Based on the words used in metadata classification the end-user, a teacher searching web-based teaching material, can search for certain learning objects with a searching tool developed in this project. The whole system is based on exchange trade and there is no charge for using these objects for educational purposes, and no compensation is paid for individual producers. Everybody has to sign a Copyright Agreement when registered to this service. So far, the use of Content Pool is limited to teachers of Eastern Finland Educational Network.

At the moment, the following information is obligatory when filling in the metadata fields: Subject, Course Number, Key Words, Description, Author, Educational Level and Status of the Object. Some of the metadata information is formed automatically, e.g. Date of Creation, Date Last Modified, File Format, Title (file name, link to location) and File Size. In addition to compulsory and automatic fields there are several optional fields, such as: Pedagogical Type of Learning Object, Type of Media and Type of Diploma. Metadata editor is continuously being developed towards a more user-friendly system.

Teachers of BIGnet are offered training to produce learning objects (e.g. by PowerPoint) in short one-day training seminars. They are encouraged to include interaction and pedagogical flexibility in learning objects, but are simultaneously informed that learning objects should be reusable, easy to use and ready-to-use. By emphasising that producing learning objects does not necessarily require high technical expertise we try to keep the threshold of sharing the learning material as low as possible. The idea is rather to gather and find good every-day teaching material with various affordances than to produce technically complicated objects. In future, the learning objects in BIGnet Content Pool might serve as an idea pool for commercial publishers. Content Pool serves also as an updated resource pool for our teachers when they are constructing online courses into Moodle (Figure 4). Teachers are encouraged to learning object based thinking and they add material to their courses by linking to the learning objects in the Content Pool. Naturally, learning objects in the Content Pool can be utilised in any Virtual Learning Environment, and also as individual objects to support face-to-face instruction.

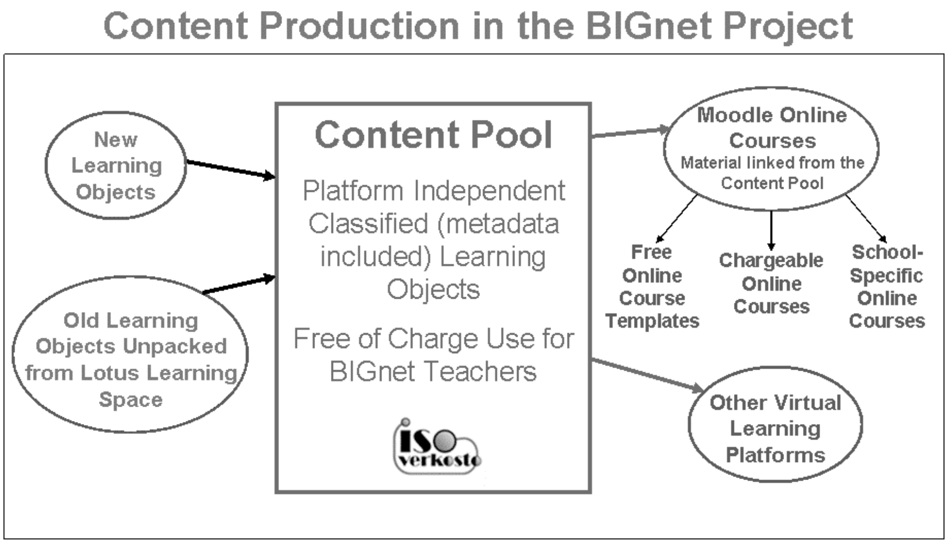


Figure 4. Overview on Content Production in the BIGnet Project

Shared Online Course Supply

Schools are encouraged to offer their online courses to students of the other schools in the BIGnet project. These courses are chargeable and the fee is based on the amount of guidance given. Most of the courses are totally virtual and last either for a few months or the whole term. The availability of shared online courses diversifies course options for a student, and enables distribution of expertise of an individual teacher for a wider audience. In term 2004-2005, 103 chargeable online courses have been available.

For course delivery, a database for courses and a web-based registration system has been developed. Students are enrolled via a local contact person who is also trained to guide students in their online studies.

The BIGnet Project also buys Template Online Courses for various subjects from participating teachers. These template courses can be used and modified by the other teachers in the project free of charge. In autumn 2005 about 90 template courses are available.

Promoting High Quality Online Teaching and Learning

Our target is that all online courses (either fully online or blended learning) meet high standards in BIGnet, even those offered for the first time. In order to achieve high standards we emphasise *continuous training and quality evaluation*. We have developed an evaluation form in Word format for assessing quality of an online course. It is based on Jonassen's (1995) theory on meaningful learning, and with this tool a teacher can assess how well his/her course fulfils the requirements of a high quality online course. The recommended characteristics of an online course in this evaluation form and in our training include clear and well-planned structure and guidance, learner-centred approach, interaction and collaboration, authentic activating tasks, means for reflection and process assessment of learning. Gilly Salmon (2002) has also suggested that well structured instruction model and active and interactive online learning (e-tivities) are the key factors for learning, and cheap systems such as discussion boards are sufficient means to produce learning. In this project, students provide crucial input to the development process by giving feedback through a web-based questionnaire after each online course.

Standardised course registration, delivery and feedback system, templates for course description (including information about contents, goals and way of performance, number and type of learning tasks, and assessment methods and criteria) and *content production models* describing steps in web-based content production also serve as quality practices in the BIGnet Project.

New Innovative Training Model

To make beginner teachers familiar with teaching and learning online, we provide about 30 so-called Training Online Courses annually. They are normal high school courses for a student and simultaneously enable local teacher to get acquainted with ICT in teaching in an authentic setting. The course producer, a senior distant online teacher, has responsibility of the content and content-related guidance and assessment, and she/he supports the local teacher in helping the students learn online. This model enables new teachers to get an opportunity to familiarise themselves with online teaching ("learning by doing") without great educational responsibility. Before and after Training Online Courses the senior online teachers and the local tutoring teachers have a chance to meet each other in a seminar arranged by the BIGnet Project. The local teachers are also introduced to planning, implementing and guiding online courses in this seminar. Following each Training Online Course online and local teachers and students are asked about their experiences through a web-based questionnaire. In co-operation with the University of Joensuu, these questionnaires are analysed, published and utilised in coming educational events and in development of online courses.

Separately from Training Online Courses basic education on planning and producing online courses is offered through more conventional training courses. They consist of three to four contact sessions, two online periods and collaborative online learning task. Topics such as computer mediated communication and copyright matters are also dealt in these courses.

Conclusions and Recommendations for Future

Promotion of networking activities is clearly needed to maintain a high quality and versatile syllabus school network in Eastern Finland. Most of the schools involved have actively and enthusiastically participated in the project events. The encouraging role of principals has proved to be essential. Their activeness mostly determines the level of involvement of an individual school. Personal contacts between project staff and teachers during the school visits and training also appear to motivate teachers to get more involved in the project activities.

More focused training is planned to activate teachers in co-operation and collaboration, and to enhance production and sharing of learning objects and whole online courses. Furthermore, the project will continue to support new teachership. Based on our experiences in 2004, it is essential to continue the training of principals and group leaders since they are the key persons to a smoothly running project. Local group leaders should play an important role in local training.

In future, our target is that the Eastern Finland Educational Network will be connected with the national and international networks. We are actively involved in developing national pedagogical networks, and national services and criteria for e-Teaching and e-Learning.

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OBSERVATIONS ON ONLINE LECTURES

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Introduction

Over the past few years, online lectures have become one of the key areas of development within the Finnish virtual university. The underlying reasons for this are primarily related to university-level teaching and learning: many disciplines need to diversify teaching and learning and to introduce more flexibility. Furthermore, technological progress has made it easier to record and distribute lectures online.

In this article, the term online lecture refers to a recording of either a real lecture situation or a simulated teaching session specifically aimed for online use. This recording contains various combinations of sound, moving or still images, and text. The online lecture may be real-time, interactive or one-way, a video conference or a webcast. Its goal is educational: to provide the students with certain knowledge or skills. As a recording, it may be characterised as one-way communication, but if necessary, channels can be created for interaction. In most cases the lecture is non-simultaneous, and the element of interaction primarily consists of the end-user's own actions online.

The University of Helsinki has pioneered many projects involving online lectures. This article discusses the experiences gained from projects in the faculties of behavioural sciences, medicine and social sciences.

Two types of online lectures

Two approaches to online lectures may be distinguished: simulation and illustration. The first means that authentic lectures are recorded so that they may be re-viewed online. In most cases the recording is made only of sound, being restricted to the teacher's oral presentation and, to some extent, the students' interjections. In order to enliven online lectures and make them easier to follow, recordings include digital photographs taken during the lecture, overhead transcripts and PowerPoint slides used by the lecturer, and other material presented during the lecture. The circumstances in the lecture room are thus simulated online. As the lecture progresses, those following it online are presented with not only the recorded sound, but also photographs of the teacher and the students, PowerPoint slides, Word documents resembling overhead transcripts and other visual material. In the lecture room, the lecture does not differ from other lectures, the aim being that the online lecture also creates the illusion of an ordinary lecture by giving the online students access to the lecture room, albeit a virtual one. The simulation perspective also influences our pedagogical approach to online lectures, even though the activity itself, the lecture, does not necessarily require a different methodology (e.g., in the way the teaching is planned).

However, the didactic approach emerges when the materials are processed, be they recorded sound, photographs from the actual lecture, PowerPoint slides, other images, or the like. Choices have to be made. Those concerning the auditory material are relatively easy to make if the whole lecture is transferred online. In this case, only the unrelated background noise is usually removed from the recording. The Faculty of Social Sciences has decided that even such noises as the clatter of chairs are included in the webcasts so as to create an authentic impression of a lecture. Visual choices, on the other hand, are more complex from a didactic point of view. Why is a close-up of the lecturer shown online during a particular point in the sound recording of a lecture rather than providing visual material of the students or the topic being examined?

When planning a traditional lecture, the lecturer is unlikely to give much thought to how it can be transformed into sound, image and other online resources and reconstructed as a whole new experience. The pertinent didactic questions in this regard are who transforms the lecture into an online resource and what the input of the lecturer is in all this. These questions are of fundamental importance for online teaching in general.

The second approach to online lectures may be termed illustration. While in simulation the teaching is transformed into another format, in illustration the teaching is designed from the start with the end product in mind. The lecture is specifically designed for the online environment, although the term lecture should be understood slightly differently in this context. Compared to traditional lectures, these recordings are brief clips which focus on explaining a particular phenomenon or giving instructions for certain action. Still and moving images are central elements in these recordings, and sound supports the presentation. The special pedagogical nature of such lectures is apparent even at the planning stage, and there is no attempt to implement the lectures according to the criteria of traditional lecture-based teaching.

When an online lecture resembles a simulation, teaching is planned as a normal lecture. The teacher does not necessarily give any consideration to the fact that the lecture may later be transmitted online. Thus the intentions underlying the teaching are not related to the online product but rather to the activity itself. Multi-channel features, that is, the incorporation of sound, image and other material, are taken into account only as an aspect of normal contact teaching, and the final product is not related to the original intentions underlying the teaching. The creation of the online lecture adds a new participant into the process, and the choices of this participant have a profound impact on the end result and its multi-channel solutions.

The intentions underlying the production of an online lecture are related to the creation of an illusion, the experience of participation in the lecture. At the same time, the person who produces the lecture also makes choices concerning multi-channel features. The pedagogical success of the lecture is partly based on the pedagogical and subject-matter expertise with which these choices are made. The process resembles the production of online learning materials as part of a team.

As stated above, in the illustration approach, teaching is designed with the online environment in mind. Accordingly, the teaching takes into account the use of technology as required by the online lecture in question, and the multi-channel solutions are made as early as the planning stage.

Experiences and feedback

Student experiences

The faculty projects involved small-scale surveys of students' and teachers' experiences (Kynäslahti *et al.,* 2004; Niittykangas, 2004). The students commented on time-related issues, such as the non-simultaneousness of online lectures and the related flexibility, which is one of their strengths. Students may follow the lectures when it suits them, which may improve their ability to learn compared with traditional lectures. Another feature of online lectures may be termed disconnection. Unlike traditional lectures, online lectures are not linear segments; instead, they may be broken into appropriate parts. The third aspect is recapitulation. The lecture or its part may be re-viewed as often as necessary. This aspect may rightly be considered an innovative opportunity to make teaching and learning more effective and to increase motivation.

Those who gave feedback on the online lectures also assessed their pedagogical appropriateness. One of the features which received praise was the wide range of ways in which a course may be completed. Online lectures are seen as more appropriate learning materials than ordinary online resources (websites). The combination of sound and image was also appreciated by the respondents. Images, be they moving or still, were generally considered as a significant element of online lectures. In contrast, the one-way nature of communication was regarded as a drawback.

Both positive and negative feedback was given on the functioning of technology used in online lectures. The students were dissatisfied with the performance requirements set by online lectures for connections and home computers. In some courses this problem was resolved by distributing the lecture materials on CD-ROMs. In general, however, the students felt that the audiovisual materials were of sufficiently high quality and that the files functioned adequately.

Some problems were caused by the software (players) used to view online video material and by the compatibility of this software, which meant that the sound or image could not be relayed in some cases. These problems may, in fact, be quite common: in the pilot project involving the continuing education of medical doctors, one-fifth of the course participants grappled with these issues, which were caused by, among other things, firewalls, old software versions or software incompatibility. The management and navigation features of software also varied. Consequently, when producing online materials, issues such as the usefulness of fast-forward, pause and other similar features should perhaps be considered.

At best, the use of online lecture and demonstration materials and the ease with which they are digested seemed to promote the learning of a new skill in a promising way. In the above-mentioned continuing education course for medical doctors, 64% of the participants (average age 49 years) felt that the course had helped them significantly to learn new practical skills.

Teacher's perspective

The teacher's perspective on online lectures does not differ markedly from teachers' views on the use of ICT generally in teaching. Why go to the trouble of implementing a new tool in the first place? Do the pedagogical benefits outweigh the additional work that is required? The requirements for support services correspond to those placed on the use of other educational technology. Likewise, the conditions for the wider use of online lectures at the University are no different from the requirements for expanding the use of educational technology.

One of the problems of online lectures from the perspective of Finnish teachers is their recent emergence. No research-based didactic approach has yet been developed, and Finnish literature on the topic is only now beginning to be published. Teachers have to re-think their lectures as combinations of auditory and visual elements. Much of this applies also to traditional lectures, but the visual requirements are less stringent in a lecture room, where teachers do not necessarily have to present the students with any visual material.

As indicated above in the summary of student experiences, those who follow online lectures appreciate the combination of sound and image and emphasise the significance of the latter. The lecturer should thus be aware that when following an online lecture, the students always see an image on their computer screens (in the wide sense, this may include a rough outline of the topic discussed). The pedagogical question is therefore why a certain image is to be shown at a certain point. This requirement of visual awareness is unusual for university teachers.

Teachers see assessment as a problem. Students follow online lectures when it suits them and may participate in a joint examination on a specific date. Before that, the teacher may have no opportunity to monitor learning performance. In other forms of online teaching, the learning platform is usually used for assessment. Traditional lecture-based teaching also provides better opportunities for interaction; the teacher can simply ask whether the students have understood the topics discussed.

The benefits of online lectures include flexibility, not just in relation to studying but also to teaching. Teachers are relieved from adhering to lecture timetables and of the need to be physically present, and they can 'teach' whenever it suits them. However, the fact that the technical production of an online lecture is likely to require the know-how of more than one person makes this a somewhat complicated issue.

The information technology used in all teaching, including online lectures, has its drawbacks. The most significant of these are unexpected technical problems, which require time and resources to be resolved, especially at the beginning of teaching periods, when problems usually occur.

A recorded lecture may be used as the central contents of a new course or as support material. If the course is given entirely online, it may be offered also to students outside the home university, which may considerably improve the teaching provided nationally on a specific field or topic.

Lessons learned

At present, online lectures remain a new phenomenon in Finnish education and in the wider framework as well. Based on the experiences obtained thus far, the following features may be considered as especially important for the planning and implementation of online lectures:

- An online lecture is not a disposable commodity. From a practical perspective, it should not be planned and implemented for a single instance of use. Repeatability is an essential element of online lectures.
- An online lecture may be produced in many ways. Technically and pedagogically simple online lectures have also proved to be practicable and appropriate.
- Access to online lectures may still be a problem, which must be taken into account in organising the distribution of the materials.
- An online lecture consists of various combinations of sound, image and text. The sound is the primary element.

Online lectures are materials used for learning. They form part of the wider framework in teaching and studying, and their use requires similar pedagogical solutions as the use of other learning materials. These solutions relate to assessment and interaction between students and between students and the teacher. The above issues should be taken into account when further developing online lectures as part of university teaching.

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CASE STUDY: WEB COURSE DESIGN WITH THE TOPIC CASE DRIVEN METHODOLOGY

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Abstract

Topic case driven methodology for web course design and realization was introduced in ICNEE 2004 (Hiltunen & Kärkkäinen, 2004). This approach is based on software engineering metaphors for capturing the necessary steps for creating web courses using a content-based development method. In this paper, we introduce results from a case study where students of computer science teacher education study line used the approach in real web course design at the University of Jyväskylä, Finland.

Introduction

Learning today is no longer confined to institutions such as schools, colleges and universities. New technology provides us new possibilities: easier access to information and better opportunities for life long learning. One of the key issues is e-learning, but we still have problems to pass: even nowadays web courses are too often simply based on exporting traditional written course materials to the web without proper planning and pedagogical design. Moreover, straight forward approaches do not support students in their individual learning styles which lead them to poor learning experiences and unwillingness to take part in the next web course. To support lifelong learning we need more quality in an e-learning context.

In software engineering Humphrey (1998) emphasizes effective planning and quality management. Both of these are useful principles in web course design also. The content of a web-based course is similar to the functionality of a computer program: they are both drivers for further development, presenting functionality and content in the best possible way to all users or students to enhance usage or learning. Moreover, there are no unified practices for web course design, but one can find some design process descriptions or models for web course creation that are either related to Software engineering (e.g. Baloian *et al*., 2001) or Instructional design (e.g. Anglad, 2002). However, all of the existing methodology fails to describe a development process that allows well-managed integration and incorporation of structural and multigranular digital material with pedagogical knowledge as well as, e.g. communication and cognitive tools (Multisilta, 1997).

Our contribution to this quality problem in e-learning is a topic case driven approach for web course design. We utilize metaphors from software engineering (following Unified Process; see Jacobson *et al*., 1999) to describe a unified way to design and realize web courses, but we blend this approach together with educational (especially pedagogical) issues. In general, the topic case driven methodology contains five phases: background study, content design, pedagogical design, technical design, and realization and assessment (see Figure 1). This approach allows incremental and iterative development of the web-course (again following Unified Process). Moreover, it can be utilized as a content development mini-project within other similar methods.

In the next sections we first consider background of our case study, and then introduce briefly our topic case driven approach for web course design together with description of the actual case study. Finally, we summarize our findings and the feedback collected from the students.

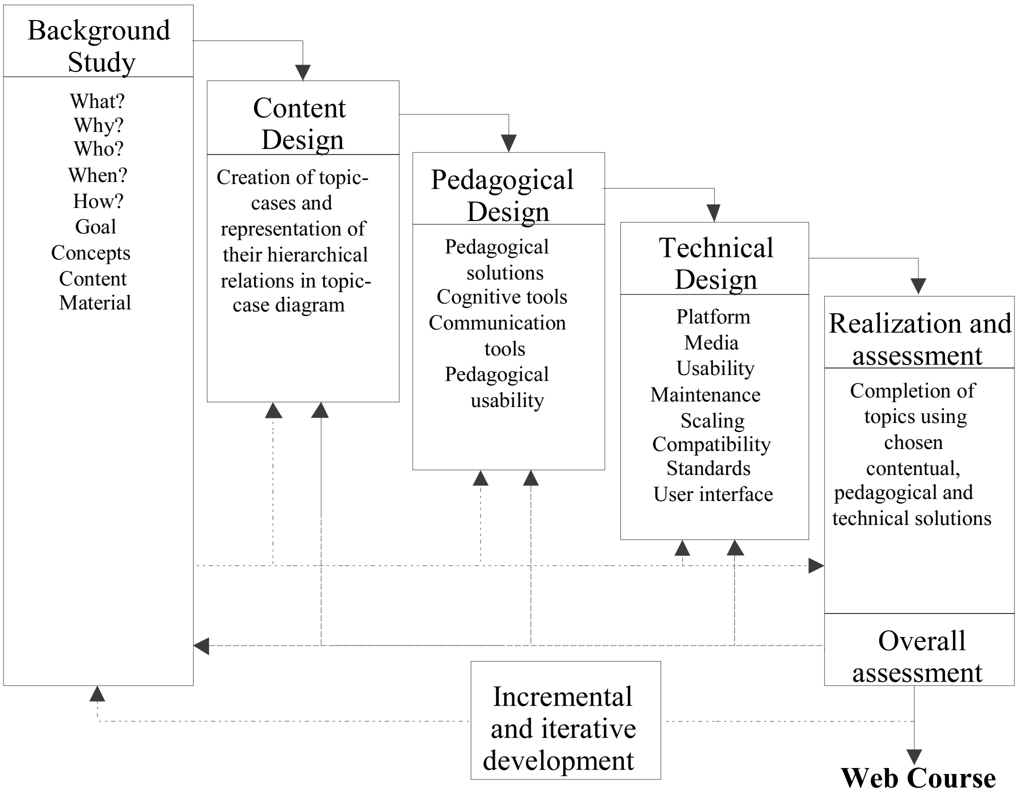

Figure 1. Phases of topic case driven web-course design and realization process

Backgrounds of the case study

At the Department of Mathematical Information Technology students may specialize in computer science teacher education and graduate as computer science teachers. Students will study both computational and educational studies. They will be familiarized with different kind of educational theories, and how this educational part can be mixed with computer science. They will practice both learning and teaching in different learning environments. Students will also review the differences between traditional classroom environment and virtual learning environment in both learning and teaching. They will also practice web course design by designing their own web course for distance or blended learning.

This case study was carried out in a Web Course Design and Implementation Course during the last autumn with a group of graduate students. The course was new and just introduced in the curriculum. There were 30 students who started the course; fourteen distance students who were also at work during the course, and sixteen campus students. Three campus students quit the course at the very beginning because of other demanding studies; so the actual amount of students was 27.

Teaching activities on the course included two-hours lectures twice a week. On some weeks we had only four-hours exercises related to video photography, sound treatment, web page design, graphics processing, and animating. We used Finnish virtual learning platform called Discendum Optima where all the learning materials were linked. Lectures were streamed as online videos so that students were able to watch those lectures in real time were ever they were. Lectures were also recorded and were linked to the virtual learning environment so that students were able to see those lectures also later on.

Learning activities on the course were divided into six learning assignments which followed the phases of the topic case driven approach (see Figure 1). By doing these learning assignments and by following this topic case driven methodology students designed and implemented their own web courses. Lecturer introduced each learning assignment beforehand and students were able to get as much guidance as needed during the each assignment. Most of the guidance was given by e-mail. During the course students wrote learning diaries which contained their feelings, opinions, and descriptions of their own actions during the course. These learning diaries were part of course evaluation that included also evaluation of activeness, self-evaluation, and peer evaluation of designed web courses.

Web course design with the topic case driven methodology

In the next subsections, we briefly describe different phases of the used methodology together with reporting students' performance on learning assignments.

Backgrounds of the web course design

During the first two weeks, students were introduced to the backgrounds of web course design: specification of the web course, clarification of basic elements on the web course by exploring web courses found from the Internet, and the introduction to basics of the web course design and the topic case driven methodology.

Background study

During the next week, students carried out the background study by defining and considering all those issues that affect the feasibility of the planned web-course, e.g. reasons for designing a web course, benefits of a web course compared to a traditional classroom course, use and role of the web, structure of the course, prospective target group or possible students, time and resources in use, basic idea, focus and goal of the course, and copyright and agreement issues in content creation (Hiltunen & Kärkkäinen, 2004). Furthermore, students chose the topic for their own courses, explored different resources (Internet, databases, books, articles, etc.), and created an idea bank from chosen topic as the first learning assignment.

Content design

During the content design students first reviewed their own idea bank by evaluating different ideas and choosing the most suitable ones into their own web course. Then, they designed and documented the basic content of their web course with topic cases by describing the necessary issues that should be treated during the course (see Figure 2). Topic cases can be documented using suitable forms capturing the necessary attributes (cf. different standards related to learning contents) during the cumulative development process.

Name of the course
Topic Case number: 1
Date / Name of the developer

Topic case:	Name of the topic case
Summary:	Brief description of the topic case
Preliminary knowledge:	Knowledge which is required before entering the Topic case
Material(s):	Material(s) engaged with the topic
Learning:	Sort of post-conditions, learning which is pursued after completing the topic case

Figure 2. Form of basic topic case description

In the used approach the topic cases carry the whole web-course development process from the initial topics and supporting material through pedagogical and technical considerations into the final realization and assessment. In particular, this technique naturally supports utilization of large, possibly distributed team of domain experts for creating (or commenting) the key contents.

Next, students linked single topic cases according to preliminary knowledge and pursued learning, and represented these relations in the topic case diagram that shows which topic cases are essential to main concepts of the course and which are prerequisites for other topics. One small example from the course is given in Figure 3.

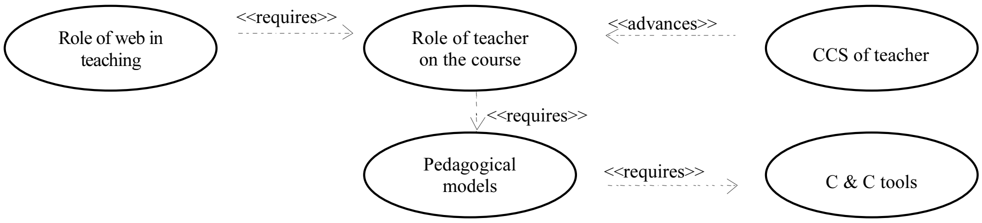

Figure 3. A part of topic case diagram with five topic cases

After two weeks students had, as the second learning assignment, finished all of the topic case descriptions with a topic case diagram that presented the basic content of the web course.

Pedagogical design

Pedagogical design is many times omitted in web-course design. By having individual phase for pedagogical design, we wanted to ensure that this issue, which should underlie all teaching activities, has its special role within web-course design.

During this phase students sized up all the selected topic cases and tried to find the best pedagogical solution for each case separately. What is the best way to teach or learn this topic? What kind of learning should be supported? What is a suitable pedagogical approach? Would it be better to utilize some other media besides text? What kind of activities (e.g. learning assignments) would support the learning in the best possible way? What is the role of teacher in these activities? What is the best way to evaluate students' performance? How previous knowledge from other topic cases supports learning?

As the third learning assignment, content of the web-course and pedagogical activities for each topic were documented with the extended topic case descriptions (Hiltunen & Kärkkäinen, 2004). This took about three weeks. The fourth learning assignment was to produce new kind of learning materials with video photography or sound treatment into students' own courses.

Technical design

During the technical design students made decisions concerning technical issues, like use of platform, medium in use, maintenance, scaling, compatibility, user interface, etc. Students could freely choose any platform they wanted (or which supported their plans best) or build the whole course on open web pages. Students used different tools and techniques freely, e.g. HTML, XHTML, Java, Java Script or XML. In spite of free hands in designing, students had to keep usability and accessibility issues in mind. Technical design was the fifth learning assignment and it was carried out in two weeks.

Realization, testing and assessment

During the last phase students completed the individual topic cases using the chosen pedagogical and technical solutions. They enlarged the contents to the final length and described teaching and learning actions in detail in connection with the final contents and medium in use. Implementation took about four to five weeks to be completed.

After finishing their implementation, students got another students web course to test and assess as peer evaluation assignment. This was the sixth learning assignment. We used eleven pages long assessment form to evaluate different aspects of the realized web courses. From this evaluation students got valuable feedback from their own web course.

Findings and feedback from the students

Twenty-one of students passed the course before the first deadline at December 13th, 2004; eighteen of them with good or excellent grades. Six students (one campus student and five distance students) needed more time to pass the course because of busyness at their work. Deadline for them is at the end of February, 2005.

We got a lot of feedback from the learning diaries that students wrote during the course. We also collected formal feedback with feedback form at the end of the course. Next, we shortly summarize the feedback that we got from those students who have passed the course already.

General feedback from the course

Students were very satisfied with the way the course was organized and carried out; 71% of students were totally satisfied, and the rest 29% of students were nearly satisfied. Students liked the way that the course was designed as a web course; according to 65% of students, it was extremely good and efficient, and according to 29% of students, it was better than average courses. According to students' feedback, course supported each one's individual learning style.

According to students, the best parts of the course were learning assignments, following the process model, and video recorded lectures. The idea to bind learning assignments with the phases was considered excellent. Without this step-by-step procedure students would not have been able to pass the course so well.

Using the process model worked very well; it supported the working process well. Students got a lot of new ideas during the whole process. The process model split the work in smaller pieces, and after that designing an own web course did not feel so hard task to do – as it first did. On the other hand, the process model also helped to see the big picture too.

Streamed online video lectures were valuable help especially for distance students. They were able to see and hear all the same things as students in campus. Video recordings were essential for those who were not always able to participate lectures on time. Most of the students watched those videos even thought they followed the lectures on real time either in distance or in the classroom.

Feedback from the designing process itself

Designing was the key word for good results. According to students, detailed design and following the phasing of the process model helped a lot to achieve the one of the course goals, a well designed self-made web course. The phasing and learning assignments spread the workload equally from September to December.

Designing was sometimes difficult, but diligence and exactness were rewarded in the implementation phase at the latest; many times already during the next step. Students were also able to utilize designs from the previous assignment on the next one.

Creation of the own idea bank was part of the background study, and it was seen as a good base for the own design project. Students were able to explore different kind of implementations found from the Internet, and they got a lot of new ideas. They were also able to refresh their web page design skills.

Before taking this course, most of the students had not realized how many different aspects they need to consider during the pedagogical design, e.g. different approaches, interaction, communication, guiding, tutoring, designing of assignments, authenticity, and different learning styles.

According to most students, technical design was unexpectedly fun and ultimately, by following the previous designs, quite easy. All the students agreed with the traditional dictum: "well designed is half done". Realization is much easier with good designs.

Improvements

Students listed two things in their feedback that need more attention and improvement in the future: amount of guidance, and timing. Some distance students complained that they did not get enough guidance during the course. On the other hand, at the same time some other distance students told that they got as much guidance as they needed. One reason might be the fact that the part of the students simply was more active and asked more guidance by themselves. There are also individual differences; some students need more guidance than the others.

Some distance students said that the timing was too fast and they would have needed much more time to achieve better results. All the distance students were working during the course and most of them had also other studies at the same time, so the timing is partly students' personal timing problem.

Conclusions

This case study was executed with a biased and small group: twenty-one students of computer science teacher education study line. The course was organized for the first time, so first time enthusiasm might have had slight positive effect on the results. Moreover, working habits of both blended and distance learning groups are much based on teacher's success in organizing and activating students. Still, very encouraging results were obtained concerning the topic case driven methodology and its utilization on the corresponding course in a bootstrap fashion. Surely we are going to organize similar Web course design and implementation course in the future terms.

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E-TUTOR PUZZLE FOR ONLINE TUTORS
AN EXAMPLE OF WEB-BASED LEARNING MATERIAL

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How should modern IT-age learning materials look like?

We can all agree that good and high quality web-materials differ from qualities of printed learning materials. Nobody wants to read long texts from the screen. Also on the web students need to see entirety of the content and progress of their working with the material. User-friendliness of the material is essential and so are also experimential elements, for adults too. Still web-materials can not be too superficial or forget the aims and objectives of learning. Students' own activity and material production as well as learning by doing are ways to promote real learning. Possibilities of animations, pictures and interaction should be taken into account. eTutorPuzzle is an example of web-based material where aim is to follow these principals. eTutorPuzzle has now been piloted with 152 students all over the Europe and it has been systematically evaluated in the use of students.

Idea of eTutorPuzzle

Main idea of the eTutorPuzzle is to present and facilitate the steps in designing of good quality e-tutoring. Material is innovative in a way it can be used both as a material in studies but also as a supportive element at daily work of teachers and tutors. When the user works with eTutorPuzzle s/he simultaneously designs a tutorial plan for him/her own purposes. Among other things the eTutorPuzzle includes for example 75 different activating methods the user can choose with the help of 20 entries.

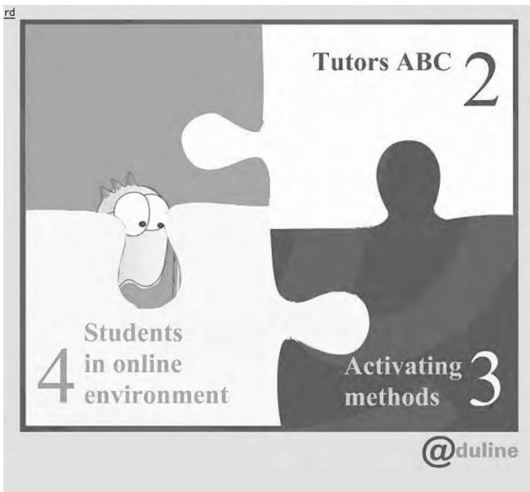

Figure 1. Frontpage of eTutorPuzzle after solving one puzzlepiece

Structure of facilitative web-based learning material

eTutorPuzzle consists of four Puzzle pieces and each of them concentrates on certain topic in the field of online learning. At each piece page the user can see three questions. When user writes notes and remarks concerning his/her own course s/he will finally has a ready-made tutorial plan which can be shared among colleagues or used as a plan in own online tutoring. User can fill tutorial plan questions over and over again and plan the tutoring of several courses with the help of eTutorPuzzle.

The prize in the end is not only tutorial plan but the user can also enjoy doing a real puzzle. After working with each piece the piece turns out to be a part of a picture. The whole puzzle is ready when job with tutorial plan is done.

Producers of eTutorPuzzle did not want to decide the order how to work with four pieces. They only recommend the order with the help of puzzle piece numbers. So the students can start working with that puzzle piece s/he finds interesting or most important.

Figure 2. Animations explain theoretical things visually

Topics of four puzzle pieces are:

- *Learning is more important than teaching*
  The first Puzzle piece describes how lifelong learning has introduced a new paradigm in the learning process centered on individuals and how eLerning is particularly appropriate to meet the new challenges. It provides pedagogical models how to design online learning and what kind of a role an online tutor has.
- *Tutor's ABC*
  The idea of this puzzlepiece is to point out crucial elements of tutoring compared to teaching. It also gives a perspective on how tutoring changes when the environment is online. Each letter of the alphabet contain essential things in tutoring, they are also like tips for tutors.
- *Activating methods*
  The idea of this piece is to concentrate on important area of online tutoring – activating students in eLearning and introduce a variety of activating methods in online environment. This part of the material includes 75 activating methods. One does not have to read them one by one in order to be able to choose the ones for certain purposes. Instead, the user can choose one of the 20 search words according to aims (for example awaken interest, support community building, promote self-direction etc.). After choosing the search word eTutorPuzzle gives 5-15 different methods for achieving the aim. Each activating method is presented shortly with its purpose, how it is organised online, how students participate, what is the tutor's role and tasks and how much time it takes. This helps in comparing the methods and in choosing the right one for own purposes.
- *Students online*
  The idea is to identify challenges and critical factors that an e-student meets in the online environment and identify how a student behaviour differs in the online environment, for example in interaction with other students and online features.

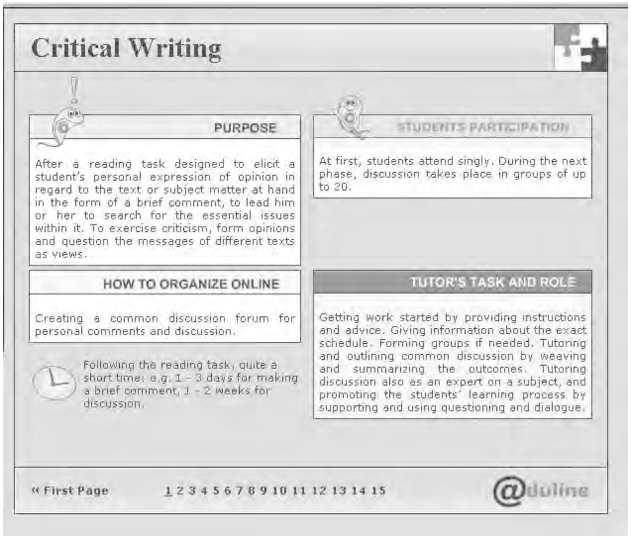

Figure 3. Example of one activation method eTutorPuzzle gave

Piloting of the eTutorPuzzle

eTutorPuzzle pilot version was used in @duline-course Online Tutoring
(101102 - CP - 1 – 2002 - 1 – FI - GRUNDTVIG – G1) where students from different countries participated in spring 2004. Students had a nine weeks totally online course and it was tutored both nationally and internationally. eTutorPuzzle was used as learning material during the nine week course and it supported students work with their own tutorial plan. All completed 78 students evaluated the eTutorPuzzle among other things because it was one of the assignments of the Online Tutoring course.

Many of the participants found that the eTutorPuzzle was innovative, inspiring and interesting tool.

Some user comments from the evaluation report:

"eTutorPuzzle was the best part of the course. It gave an opportunity to analyse my opinions and experiences and to compare these with study materials. eTutorPuzzle had the practical value. It supported the formation of my tutoring plan."

"The eTutorPuzzle was the most significant part of the course. I don't think I would take advantage of the course if there wasn't eTutorPuzzle."

However, some found it to be a little bit too complicated and confusing. After piloting a Help-tool was added into eTutorPuzzle. Now it is easier to get the idea of whole material and see what users are supposed to do with it.

Still it is obvious that not at all students are ready to use such a learner centred and interactive learning material that eTutorPuzzle is. Expectations toward more traditional forms are still strong and some students need many kind of materials in order to catch the aim and content of the course.

Based on evaluation of Online Tutoring course four kinds of student types can be defined that tutors of the course faced. As material users they were also like these student types. For some of the students the idea of eTutorPuzzle was easily understod and they enjoyed working with it. Part of the students were unsure of the aims and methods they were supposed to achieve with the use of eTutorPuzzle. Some students did not feel the added value of eTutorPuzzle compared to text based material. And there were also a couple of students that felt the eTutorPuzzle mainly disturbed their learning process rather than supported it. Based on the feedback students gave four kinds of student types can be classified that had different expectations of the web-material.

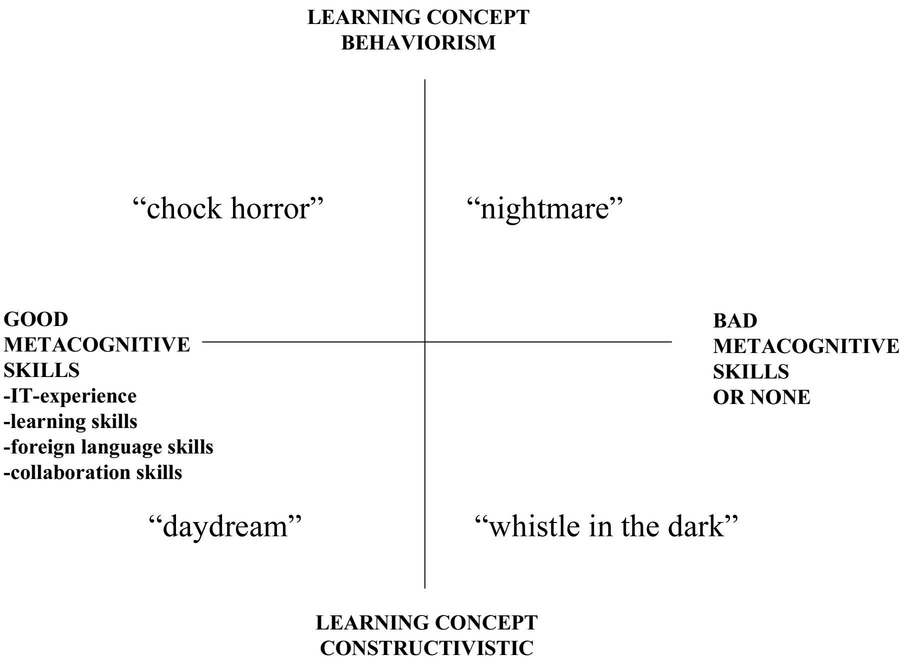

Figure 4. Online learning student types

Web-tool for many purposes

Now eTutorPuzzle is available in English, Finnish, Swedish, Danish, Portuguese, Lithuanian and Estonian. Material was designed as an independent material that can be used in different organisations no matter what learning management system they use. This is why eTutorPuzzle is a databased material (the server has to support php and mysql). For this reason it is possible now to use eTutorPuzzle also in other courses and organisations who want to support their teachers or studens in the field of online tutoring. eTutorPuzzle is a web-tool in tutors' daily work in schools and in all kinds of organisations. More information on site http://momu.utu.fi/ and http://www.tkk.utu.fi/aduline/

Evaluation of eTutorPuzzle's pilot use

Students and tutors all filled in the evaluation questionnaire in Online Tutoring course. Sirje Virkus analyzed 81 questionnaires. The majority of the respondents noted that the course materials were of high quality, easy-to-use and relevant for the topics of the course. Many respondents found the idea of presenting the material in the form of eTutorPuzzle interesting. Still having the eTutorPuzzle pieces printed out was considered to be very important to some participants. Large amount of materials worried at least some of the students. And this is food for thought: is interactive web-material as a learning material still too modern? For example search engine of activating methods is meant to work as a tool for tutorial planning. At least some students still waited more traditional materials and did not understand the added value of interactive web-tool.

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CONTENT CREATION CHALLENGES AND FLOW EXPERIENCE IN EDUCATIONAL GAMES

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1. Introduction

One of the challenges of designing digital learning materials is that of engaging students. Hosting a Web-based course should not just be about providing information but also about facilitating students' experiences. According to constructivists, individuals make sense of their world by constructing their own representations of their experiences (Tytler, 2002). Unfortunately, technologies are too often used as substitute teachers that deliver information to learners rather than as learning tools that support the active learning process. According to Shneiderman (2003), we have to do more than teach learners to surf the Net. We have to encourage learners to be creative and teach them to make the waves for surfing. According to Jonassen *et al.* (1999) technologies can support the constructing of meaning by learners, but this can happen only if learners learn with technology not from it. In fact, Mitchell *et al.* (2004) have stressed that learning sessions that lead to satisfying and concrete outcomes become engaging and effective.

One approach to facilitate learners' experiences is to utilize online computer games in education. Computer games may create a new learning culture that corresponds better with students' habits and interests (Prensky, 2001). Generally, games satisfy the basic requirements of learning environments identified by Norman (1993) and can provide an engaging environment for learning. In fact, Kiili (2005) has proposed an experiential gaming model that can be used to design engaging educational games. In this paper, an educational game, IT-Emperor, designed according to experiential gaming model is presented. However, the main purpose of this work is to study the usefulness of content creation challenges and learners flow experience in IT-Emperor. The experiential gaming model and flow theory presented in next chapter provide the theoretical basis for this study.

2. Experiential Gaming Model and Educational Experience

In this chapter an experiential gaming model is shortly presented (Kiili, 2005). The main purpose of the model (Figure 1) is to link game design aspects with experiential learning in order to facilitate flow experience. Flow describes a state of complete absorption or engagement in an activity and refers to the optimal experience (Csikszentmihalyi, 1991). The model describes learning as a cyclic process through direct experience in the game world. Both constructivist (Phillips, 1995) and pragmatist (Kivinen & Ristelä, 2003) views of learning are adopted. The model stresses that activity that is necessary for learning is not merely cognitive but also behavioural. Thus, learning is defined as a construction of cognitive structures through action or practice in the game world.

The challenges based on educational objectives form the heart of the model. The task of the heart is to sustain the motivation and engagement of the player by pumping appropriate challenges to him or her. To overcome the challenges, a player generates solutions in the ideation loop. After the ideation phase the player tests solutions in the experience loop and observes the outcomes of actions. Games should be usable, provide possibility to achieve control and provide clear goals and appropriate feedback to the player in order to facilitate flow experience. The reflective observation of the feedback may lead to the construction of schemata and enable the discovery of new and better solutions to the problems. From a motivation and learning point of view, the operation of the heart is essential. The heart should provide a player with challenges that are matched to his or her skill level in order to increase the likelihood of experience flow.

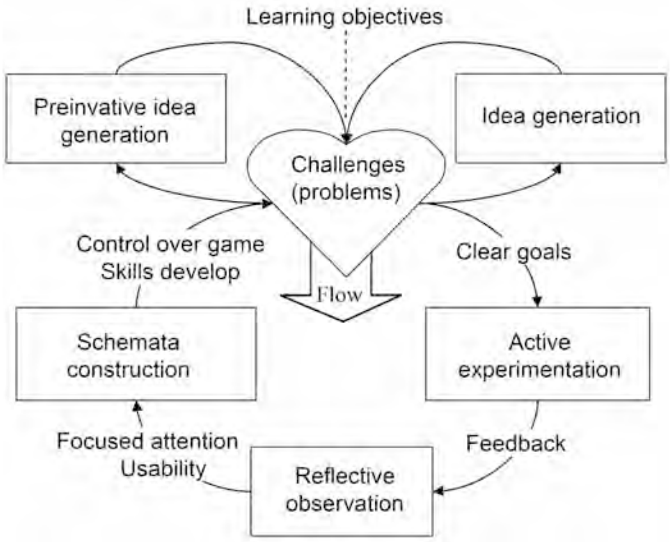

Figure 1. Experiential gaming model

2.1 Challenges in educational games

Gameplay is the core of the game and its significance should not be underestimated. Game designers Rollings and Adams (2003) have defined gameplay as one or more causally linked series of challenges in a simulated environment. In fact, gameplay also includes the actions that the players can take to meet challenges. According to Costikyan (2002) good gameplay keeps a player motivated and engaged throughout an entire game. Rollings and Adams (2003) have distinguished several types of challenges that can be applied to educational games. However, they do not present a type that clearly matches to content creation challenge type that is the focus of this paper.

Generally, content creation challenge can be defined as a problem that requires player to design and produce learning material. The results of several studies have shown that challenging learners as designers or producers of learning materials engage learners and may increase their understanding of a subject matter (Stern *et al.,* 2003; Kafai *et al.,* 1997; Mitchell *et al.,* 2004). The role of learners varied a lot in these studies but in some sense the participants of each study actively produced at least part of the learning materials. For example, the study of Mitchell *et al.* (2004) showed that the use of student-generated multimedia products worked as a good pedagogical strategy to encourage learners to think more deeply about academic content resulting in a deeper understanding and a higher level of student engagement. On the other hand, Stern *et al.* (2003) found out that the active creation of a graphical representation based on text information was a powerful transfer tool. In summary, the results of these studies indicate that while constructing materials, learners may became more aware of representational elements and their relationships, leading to more elaborate and better organized knowledge structures.

2.2 Educational experience in games

The aim of educational games is to facilitate players' experiences. In particular, games designed according to experiential gaming model aim to provide players such gaming experiences that achieving a flow state is possible. In order to be able to understand the background of factors that contribute to flow experience, the elements that constitute an educational experience have to be distinguished. In fact, Garrison, Anderson and Archer (2000) have identified three elements that are crucial prerequisites for successful educational experience. These elements, cognitive presence, social presence and teaching presence are outlined in Figure 2.

The original model of Carrison *et al.* (2000) was embedded within a Community of Inquiry and was used as a framework to study text-based computer conferencing. However, the model can be utilized also in the context of educational computer games. The first element of the model is a cognitive presence that refers to ability to construct meaning through action and communication in the game world. It is a vital element in critical thinking. The second element of the model is social presence that supports cognitive presence by facilitating the process of critical thinking carried out by the community of players. The third element of the model is teaching presence that consists of two general functions usually carried out by a teacher. A teacher designs the educational experience and works as a facilitator of the game.

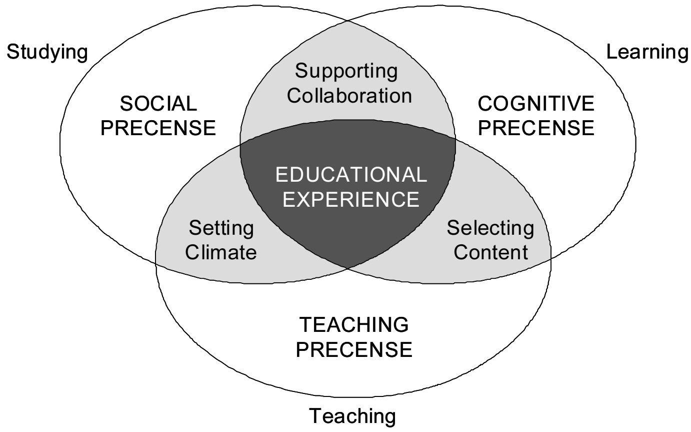

Figure 2. Elements of an educational experience (adopted from Carrison *et al.,* 2000)

The model is in line with teaching-studying-learning (TSL) process (Uljens, 1997), which underlines the importance of all these components. Thus, the model is supplemented with teaching, studying and learning process. The TSL process is based on the idea that teaching does not lead to learning directly. The studying component is needed in between these fundamental components. Thus, teaching influences indirectly to learning via learners studying. It is important to realize that even though the new technologies including educational games have broadened the TSL horizon, they are still just tools that serve the process. In this paper, TSL components related to core elements of the model are seen as a dynamic wholeness. In different game contexts, the roles of TSL components may vary.

In ideal situation while playing an educational game a player may experience flow. Flow describes a state of complete absorption or engagement in an activity and refers to the optimal experience (Csikszentmihalyi, 1991). During optimal experience, a person is in a psychological state where he or she is so involved with the goal driven activity that nothing else seems to matter. Past research has shown that the flow state has positive impact on learning, attitudes and exploratory behaviour (Webster, Trevino, & Ryan, 1993) and thus should be taken into account when designing educational games. Experiential gaming model stresses the importance of considering several factors that contributes to flow experience. In this paper, these flow antecedents, clear goals, appropriate feedback, good usability, playfulness, potential control and a perception of challenges that are matched to the person's skills, are studied.

3. Research Method and Objectives

3.1 Research objectives

The aim of this study was to examine players' experiences about IT-Emperor. The study focused on the flow antecedents included in experiential gaming model and the usefulness of content creation challenges.

3.2 Description of IT-Emperor

IT-Emperor is a Web-based educational game where the students of university level work in a production company as trainees. Players are hired to produce a learning material about usability. The game administrator designed the educational experience by defining the content, the rules and the activities of the game. A demand-driven learning model (MacDonald *et al.,* 2001) was utilized in the design process. One consideration in particular was a consumer demand of authentic and industry-driven content. As a result, the content of the game reflects the problems and issues that may arise in a production company. In addition, a jury formed from members of different corporations was employed to give feedback to the players.

At the beginning of the game each student has an original, poorly designed, learning material that has been divided into components. Students can replace the original components with self-made components or they can buy components that other students have made from market place if they have enough credits available. Studying presence is supported by allowing players to produce components collaboratively and offering discussion area for players. In addition, players are employed to asses the components that other players have made. The success in a component market and evaluation reports of the company's board provides a meaningful feedback channel for the players. The game lasted three months and it took approximately 30 hours to accomplish the game. In order to boost the progress of the game it was divided into three phases. Players had to produce and buy components a certain amount in each phase. Deadlines of each phase guaranteed that actions performed settled steadily on three months time interval. Without these deadlines the actions performed would probably have settled on the last weeks of the game. Additionally, the phase deadlines provided a good framework to observe players progress in the game.

3.3 Participants and Data collection

The participants were eighteen university students that had used Web over five years. The data was gathered in the final quarter of the game with questionnaire that included both structured and open-ended questions. By using both structured and open questions, the author was able to use different data sources to validate and crosscheck findings. The flow experience was measured with questions that were directed from questionnaire designed to measure the flow construct in online environments (Novak *et al.,* 2000). The open-ended questions were intended to aid in exploring antecedents of flow experience. The questions that measured usefulness of content creation challenges were included into the same questionnaire. The scales varying from two to four were presented via a Web-based form that students completed and submitted online. When the game was finished the knowledge level of students was measured with post-test that was implemented as an exam. Post-test consisted of two open-ended questions that measured both retention and understanding. First question was a control question that measured knowledge that was presented in lectures and included in exam material. Second question measured knowledge that was needed to complete the game. In other words, question measured knowledge about components that players had created or bought from the market place.

4. Results and Discussion

IT-Emperor aroused interest among participants while 15 players reported that they were interested in the game. Although most of the players liked the game, two students would like to have performed the course in more traditional way. For example player X felt that "*From learning point of view, the game is nice change for traditional courses because there have not been such courses before*". He also stressed that the game was effective from learning point of view, "*By creating content one can learn things without noticing it*". However player Y felt exact opposite, "*The feeling of playing is confusing, the whole game feels so complicated and laborious*". In fact three other players also reported that the game is too wide and takes too much time to complete. Player A stated that, "*There is too much work. The components in the market place are so trashy that I should have to make all content components myself, but I did not have enough resources for that*". Such players that felt the game too laborious did not catch the whole idea of the game. Generally, one aim of the game was to simulate a situation where player is obligated to optimize all available resources in order to get the job done. Sometimes one has to make compromises and accept bests of the half-baked outputs available.

It seems that players were engaged in creating content which is positive because 16 players experienced the content creation as an effective way to learn things. The result of the post-test supported this experience. Players performed significantly better on the game-based task ($M = 4.6$, $SD=0.706$) than on the control task ($M=2.25$, $SD=1.004$), $t(14)=-8.612$, $p<0.001$. This result is consistent with the findings of earlier studies (Stern *et al.,* 2003; Kafai *et al.,* 1997; Mitchell *et al.,* 2004). One problem of the content creation challenges was plagiarism. Few players had plagiarized content from internet and tried to sell it to other players. Fortunately player B informed about that problem as follows "*The idea of the game was ruined on first week by player who put many very cheap and plagiarized components into the market. Now all the components are cheap because nobody buys expensive ones*". Previous research indicates that plagiarism is a significant problem in higher education and that the magnitude of the problem has increased in recent years (Austin & Brown, 1999). The use of computers has made plagiarism easier while word processing programs allow students to easily "cut and paste" information from the Internet. In the game the players who plagiarized content had to pay compensation about their offence against copyright. It seems that plagiarism is a big threat to games that consists of content creation challenges. Thus, in future a checking system for plagiarism will be developed to IT-Emperor.

Some of the players felt that the rules of the game were too complicated while the game was divided into three phases. On the other hand others liked the phase method that was designed to help players to perform certain tasks in time. Generally, the goal of the game was clear and well understood. When asked about the feedback that the game provided 11 of the players stated that they did not have to wait feedback from the system too long. For example player B liked the reports that Emperor generated. "*The phase reports are luxurious. Also the messages from the boss are useful because one always knows what the situation of the course is and what have to be done.*"

There were some usability problems in IT-Emperor that disturbed players' experience. Only three players stated that usability problems did not disturb their playing experience. Player B felt that, "*game is quite clumsy and raw, but with little development it could be extremely nice and interactive*". However, in spite of usability problems 14 of the players stated that they could focus their attention to the game and concentrate on playing. In addition 12 of the players felt that they could control their playing. As a summary, the results of the study indicate that all the flow antecedents included in experiential gaming model, clear goals, appropriate feedback, usability, focused attention and control over game, could be found from user experiences. It seems that despite of some usability problems IT-Emperor provided a learning environment that makes flow experience possible. While playing IT-Emperor half of the players reported that they had experienced flow. Content creation was the main reason contributing to flow experience, but also the action in the market place was considered as a trigger of flow experience. In summary, most of the players felt immersed and tended to loose track of time while playing. However, in order to study flow experience more exhaustively deeper analysis and interviews are needed.

5. Conclusion

The results indicate that content creation is a working challenge type in educational games. The players of IT-Emperor experienced content creation as an effective way to learn. This experience was supported by the results of the post-test. However, a problem of content creation challenges seems to be plagiarism. In IT-Emperor some of the students made offence against copyright that disturbed the game balance. In order to guarantee equal playing experience for all players a checking system for plagiarism will be included in IT-Emperor. Although, plagiarism is an unfortunate issue a game is a good context to handle these offences against copyright so that students understand the seriousness of their behaviour in life like situations.

While playing IT-Emperor half of the players reported that they had experienced flow. Content creation was reported as a main reason contributing to flow experience. It is apparent that flow experience cannot be guaranteed to players, but educational games such as IT-Emperor can provide a possibility of experiencing flow. The reward of flow is obvious: it has a positive impact on learning and players' attitudes. In spite of good usability players experienced that the flow antecedents included in the experiential gaming model were supported in IT-Emperor. In IT-Emperor the goals were well understood and students felt that feedback was appropriate and encouraging. Although there were some usability problems students could still focus their attention to playing the game not to use of the artifact. Likewise students felt that they achieved control over the game and challenges. However, the data gathered in this study is not adequate to study flow experience exhaustively. In future the students will be interviewed and more detailed analysis will be made.

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ON SELECTION OF VIRTUAL MATERIAL IN THE DIGITALLY DIVIDED WORLD

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Introduction

Although the world is digitally divided, benefits of the networked world can today be enjoyed to some extent also by the global majority of students who either do not have Internet connection at all or whose connection is slow. While students in large parts of Europe, North America, Japan, Australia and many metropolitan areas in the developing countries use the World Wide Web for continuous and direct on-line educational activity, students in areas where off-line computers are available in schools can access the vast universe of virtual study material through indirect material distribution chains consisting of on-line functions (downloading of Web material) at educational centres and off-line functions (burning of CDs, road transportation) locally. Actually some of the Web-originated learning material can even be delivered to students who do not have computers at all, through hardcopies printed at educational centres.

Because the Web contains such enormous quantities of material that it is often time-consuming to find the relevant information, educational institutions face a tough challenge of selecting relevant material for their students. For students who use the Internet on-line, it is essential not to waste their valuable study time and guide them to relevant websites and provide them with proper criteria for search of information. For the majority of the students in the world who use computers off-line or who do not use computers at all, institutions have an even greater task of finding and selecting relevant virtual learning material, including collection, duplication and locally designed distribution of the selected materials. Failures in selecting and delivering material are crucial and feed negative attitudes against modern ways of learning.

In this paper we concentrate on analysing locally determined criteria of the quality of virtual learning material, based on both earlier papers and hands-on experiences in Europe, Asia, Africa and Latin America. We find that the digital divide has impact on several aspects of material selection.

On-line vs. Off-line

The digital divide is a borderline not between countries and continents but inside most countries. Many developed nations have remote regions where Internet connections are poor, while most metropolitan areas of developing countries possess high-speed broadband services. The digital divide is often the administrational frontier between the capital city and the rest of the country. For example, in Sri Lanka the cost of bandwidth becomes hundredfold when the city limit of Colombo is crossed.

The natural very first question for an evaluator of virtual study material is: do the students use a fast and reliable on-line Internet connection or do they work mostly off-line with perhaps occasional dial-up connection? In the first case, use of sophisticated on-line Web environments – often made in North America and Europe – will be possible, but in the second case not. For example, on the Web there are several interactive exercise environments and systems which contain sending answers and other on-line functions for immediate automatic feedback. These are feasible for users of fast reliable Internet connection, but not for others. Efforts of trying to use such environments with poor connections will result in failure.

It must be also emphasized that all "broadband" connections are not sufficient for using modern on-line environments, because often an educational institution – especially in the developing countries but often also elsewhere – may have a great number of simultaneous users, and an individual user of an on-line study system would only end up being one of the frustrated visitors of the infinite halls of the World Wide Wait. The horror scenario of educational technology – school computer learning centres turned into world's slowest Internet café duplicates with no pedagogical off-line material available and everybody tapping on the Enter key waiting for the browser to move to the next line – is unfortunately true in too many schools on the rougher side of the digital divide. In order to avoid this scenario, the evaluator should test carefully the functionality of the website in a real situation. For those users who have a slow Internet connection, further evaluation is directed to material which can be downloaded from the Web using some other computer and then used off-line. Even those who have computers with no Internet connection at all, can still obtain downloads from somewhere else and use them off-line.

Language

The second fundamental question for the evaluator is: what language should be used as instructional language of the study material? If study material is needed only in one language, any material in other languages should be omitted in the selection process. If students need material in English, it is useless to provide them with materials in Finnish, and vice versa.

The digital divide widens the gap between big and small languages, because the amount of quality virtual material produced in big languages is so overwhelming compared to what has been produced in small languages. A large number of all the virtual learning modules available on the Web has been written in English, which means that the countries or areas where English is one of the languages of learning have larger opportunities of obtaining material for their students. Spanish, Japanese, Chinese and German are other big languages of the networked world.

However, most people in the world prefer to study in their own native language. The dominance of English among the available Web material has resulted in efforts of local production of virtual learning material around the world. Recently the European Union funded Celebrate project has produced hundreds of virtual learning objects in several European languages for the use of European schools, and it remains to be seen how significant impact they will provide for European students. In Sri Lanka where the author has worked for modernization of secondary education, material is needed in Sinhalese and Tamil, and local production of virtual learning objects has recently started with the assistance of the Asian Development Bank.

Cost

The cost of the virtual material is another important fundamental factor for the evaluator. For many education providers, especially in the developing countries, it is important to obtain virtual material which is free of charge or at least almost free of charge. This is an important aspect for sustainability of any systems which rely on modern educational technology, since most schools and other educational institutions in the world are not especially wealthy.

Today the World Wide Web provides reasonable amount of quality material free of charge. We have recently downloaded several packages of interactive material for science education in secondary schools, including excellent virtual laboratories of electricity, light and other physics topics, interactive biology environments and also useful language learning modules.

Some producers of educational material provide their products for free for educational user groups, in order to obtain references, user testing and in some cases further developed products in return, much in the same way as the Linux operating system was developed as a free product. For example, the Hot Potatoes teacher's tool for making interactive exercises only requires that the use of any prepared interactive exercises will be provided openly via the Internet for anybody. In the areas on the other side of the digital divide this requirement is of course theoretical because there is no feasible Internet service to be used for delivering the locally made interactive exercises.

Selection Process

If the laborious task of proper selection of material is done systematically, the evaluation process can contain several steps: initial search, pre-assessment, downloads of material, pre-selection, evaluation and final selection. Initial search, pre-assessment and downloads can be done by teacher, student, educational planner, school administrator or actually almost anybody who can qualify and disqualify material according to initial criteria. During the pre-assessment, according to the hands-on experience of the author in several countries, study material should first pass the on-line/off-line criteria, then the language criteria and then the cost criteria which have been discussed above. Then, before the actual evaluation, it is useful and time-saving to do a pre-selection among a small group of experts so that only the best materials are accepted for the main evaluation.

Numerous educational authorities have published their evaluation checklists (see Ref. 3). Items on the checklists contain basic facts on the material, with technical details such as the type of the material (game, quiz, simulation, tutorial, exploration, other), the media (text, audio, graphics, animations, music etc.), the suitability for individual students or groups. And then the evaluators arrive at the main issue, the actual quality of the study material. What is good material? This question is often viewed from two separate points of view: (1) pedagogy and (2) curricular match.

Pedagogically, educators all around the world complain that virtual study environments in reality are not good: “e-learning environments” consist often of collections of only PDF or DOC documents, “interactive study groups” mean often only email exchange, “interactive environment” often consist of only mechanical yes/no and multiple-choice exercises. Educational environments cannot compete in sophistication with modern commercial interactive games such as SIMS 2. Everybody would naturally like to see better systems: truly intelligent virtual study materials of pedagogically high quality, with balanced combinations of sophisticated visually impressive information content and versatile student interaction (free text, multiple choice, gap filling, graphic evaluation, sound evaluation etc). Learning materials should be arranged according to some pedagogical purpose. There should be a smart tracking system for exercise scores. Students should obtain interesting feedback from the system. The teacher should be allowed to modify the content. User-friendliness is a central issue: instructions must be easy to obtain and understand, the material and its parts should be easy to start, it should be easy to move from one part to another and at the same time save previous work, and to quit and save previous work, etc.

Compatibility of the virtual material with local curriculum is essential for many countries and educational institutions. The material is screened thoroughly by a number of curricular experts who get to know the material well. Evaluators determine the curriculum area, subject, topic or competence, grade, and assess the relevance of the material to the local curriculum. It is important to find out what complementary material to the taught topics or competencies does the material offer, and what information is provided more effectively by the Web material compared to classroom learning. The task of the evaluators is to observe if authors of the virtual material are claiming to achieve certain objectives, and assess if those objectives have really been achieved, and also assess if any other objectives have been achieved.

The World Wide Web is a cultural bridge allowing information move at the speed of light between faraway countries. In some ways the traffic may be too fast. For many cultures it is essential that the virtual material carried by the Internet should not provide students with controversial cultural issues. In the areas where strong local culture meets the Web with its instant access to Western decadence, this issue can become a big problem. Anybody who visits Internet cafés in South Asia, Africa and Latin America, can verify the chaotic rendezvous of cultures when European and American hardcore pornography and violence meet locally educated youth. Students are not the only ones who are affected: in one African educational institution where we worked, an internal investigation revealed that the teaching staff spent more than 90% of their Internet time on porn sites. The digital divide may in this respect actually become a saviour, because if the Internet connection is non-existent or poor, students and teachers are protected against the dark side of the Web – not to mention viruses and spam which cause their worst havoc in the developing countries. Educational systems where students are provided with pre-selected virtual study material duplicated on CDs avoid the problems of the wired ones. Some countries – for example South Korea – have tried to control the proliferation of unwanted material on the Internet by licensing the service providers and approving the sites that can be made available for the public.

Drake's Equation

Those who are interested in estimating the probable number of existing relevant materials on the Web can apply Drake's equation, a simple tool for estimating the probable number of civilizations in the universe, used for the SETI (Search for Extra Terrestrial Intelligence) research,

$$N = n\,p\,l\,i\,c\,t$$

with variables

n = number of stars in the universe;

p = fraction of stars having planets;

l = fraction of planets supporting life;

i = probability of intelligence developing on a life-supporting planet;

c = probability of intelligence communicating with us;

t = probability of a civilisation overlapping in time with us.

Drake's equation is a popular tool in cosmological discussion, and the obtained results for N fluctuate heavily, usually between one and one million, depending on values given to the variables.

Instead of the physical universe, we can apply Drake's equation to the universe of educational material on the World Wide Web. Concepts of "star", "planet", "life", "intelligence", "communication" and "civilization" can have modified meanings relating to properties of the educational material, and the meanings can be chosen in a creative manner useful for specific situations, and in some cases it may be necessary to use more variables which would become additional coefficients on the right side of the equation. We can identify stars with educational websites, and planets with linked pages to the main pages. "Life" can mean "living" educational content on a webpage, i.e. something more than just titles, subtitles and links to other pages. Intelligence in educational application would mean user interaction, feedback and versatile types of communication, and instead of only one variable we can use several variables, corresponding to items on evaluation checklists. The concept of communication can mean the communication language of the material. "Civilization" can mean for example some existing curriculum, and overlapping could mean matching it. Properties of the material such as cost, on-line/off-line usability etc. can be additional variables in Drake's equation. One educational version of Drake's equation has been constructed in Ref. 11.

Conclusions

Selection and evaluation criteria of virtual study material are influenced by the global digital divide in various interesting ways. It is important to do the process of evaluation according to certain order. The probable number of available materials satisfying certain criteria can be estimated by applying Drake's equation.

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FLEXIBLE WEB-BASED ASSESSMENT METHODS – A VIRTUAL UNIVERSITY PROJECT AT THE DEPARTMENT OF FOREST RESOURCE MANAGEMENT AT VIIKKI CAMPUS

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Introduction

Changing theories and methods of assessment have been the focus of significant attention in universities for some years now. University of Helsinki established a project called the "Flexible web-based assessment methods" in Spring 2003 in order to give more options to students, teachers and faculties to commit assessment. Viikki Educational Development Services (VEDS) was asked to participate the project with its ICT pedagogical expertise. This study is a part of the flexible, web-based assessment methods project. The paper gives an example of how to implement a web-based assessment system at a department in university including the pedagogical aspects with the teaching and learning development processes.

Assessment procedures at the Department of Forest Resource Management

In the beginning of the project teachers were willing to give students the opportunity to decide themselves when to do their examinations. The flexibility of time was thought to be the main innovation. Teachers had an explicit idea what kind of examinations were suitable for the web-based computer system. They presumed that so called close book examinations would be easy to transfer into a web-based computer system. Monitoring few students irregularly had been both inconvenient and a cost for the department. However, some aspects of flexibility were lost when applying a traditional assessment procedures into a computer mediated environment.

The department had a special resource to support teachers to take a new computer-based assessment system. An advisor in pedagogical ICT offered personal guidance for teachers to establish their examinations into the system. There was also a project group which took care of schedules, orders and different arrangements needed during the preparations. The group included experts of pedagogy, ICT and educational technology in addition to teachers and students of the department. Thanks to the support available, the teachers involved were not left by themselves to handle the problems.

The tool in use: a web-based computer system for assessment procedures

The system allows students to take an examination with networked computers and web-cameras identifying and monitoring students in a room designated for it. The teachers were able to check the video of the webcamera afterwards over the network. The examinations were done with a special software for it, called the SoftTutor software. The new procedure to do examinations was named Examination aquarium in consequence of students being monitored and seen openly when doing their examinations.

The SoftTutor software is a computerized testing package for learning assessment. It includes question types like multiple choice, move object, text input, draw pairs and free-format text. The SoftTutor has the basic features for creating tests like writing questions compiled as a library, offering a signing up feature for examinations, displaying the tests to students over a network and generating and recording assessment and feedback information. The SoftTutor software is owned by a small Finnish software company called Sordino Information Systems Ltd.

A Methodology chosen for the study

When the project started VEDS planned a study in order to collect information and to watch the progress of the project. There were three different points of view to the study questions:

1. Support for teachers using a web-based computer system for assessment design, development and related procedures.
2. The tradition and culture in designing and making examinations for students at the Department of Forest Resource Management in Faculty of Agriculture and Forestry.
3. The knowledge and theory of how assessment influences studying and learning and what features pedagogically sound assessment includes (see for example Edwards & Bruce, 2004).

When the teachers with this study had some experience of creating tests in the system and marking tests they were interviewed. Based on their experiences it was possible to evaluate what kind of problems teachers usually have and what kind of support they needed with this project. The first 20 students who did examination with the SoftTutor system returned a web-inquiry about the new system to do their examination. Few students were interviewed by phone.

Study results

The teacher interviews and student inquiries were analyzed and classified. There were certain immediate study results which required action:

- Students did not fully utilize their opportunity to determine themselves to most suitable time to do the examinations. For instance, 14 students out of 40 with the course "Wood as construction and furniture material" did not perform their examination during spring 2003 although they had attended the lectures and exercises included in the course.
- Teachers did not want to try out assessment methods which differed form the traditional assessment procedures. The new method to plan the examination with question library, grouping the questions, setting the examination for student registration and performance was a big enough change. Still, the research results about assessment tell us clearly what kind of learning effects and learning results closed-book-examinations have.
- Most of the students participated in the project were satisfied of the opportunity to decide themselves when to do their examination. They also appreciated the possibility to write down the answers with computer. But part of the students felt uncertain because of not being familiar with the interface of the system, for instance not being sure of the time left or how to save the answers for the teachers.

With this project it became obvious that both students and teachers needed training. Now only teachers were coached and trained. A support person informed students of the new system but they still would have needed a test try out. Doing an examination is an exciting moment and it is cognitively demanding situation. Students do not have extra information processing capacity when they need all their capacity with memorizing the information they try to keep in mind when taking an examination.

A special emphasis should be put on to the integration of hands-on training and pedagogical aspect of the assessment methods which support students' deep approach to learning (Brown *et al.* 1997, 27). Teachers were consulted to evaluate their examinations from pedagogical aspects.

Outcomes of the study

Teacher interviews and student enquiries proved that the new manner to make exams with computers and the flexibility it gave to students and in some extent to teachers too was highly appreciated. The specific software, however, proved to be unreliable in some extent. It was hard for teachers to concentrate on the pedagogical aspects at the same time with the new software in use. Based on these experiences teacher training was designed so that the part with pedagogical aspects was offered afterwards in connection with a reflection of the teacher experiences.

Future plans

The development work with assessment procedures at the department has been useful. There is discussion about assessment methods and how and when to use different implementations. The next phase will be a joined effort at the department; review the assessment procedure from a university program point of view. Then, there will be a bigger emphasis on students' aspects and how different assessment methods support learning and seem to be meaningful for students. One good possibility is to connect the development work with the quality assessment work in the university.

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DISTANT LEARNING PROGRAMS ON ENTREPRENEURSHIP IN HIGHER EDUCATION AND UPPER SECONDARY SCHOOLS IN FINLAND – TWO DIFFERENT CASES

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Introduction

Entrepreneurship and entrepreneurial behavior are considered to be essential competences and constructs of individual competitiveness in the future. In order to face this challenge, entrepreneurship has become part of all education levels in Finland. The two different cases of enterprise education programs presented in this article are coordinated by Turku School of Economics and Business Administration.

There exists a variety of opinions on whether entrepreneurship can be taught at all (Fiet 2000). Previously entrepreneurship has been considered as an inborn characteristic of an individual that can not been taught or altered via education. Nowadays entrepreneurship and entrepreneurial behavior are seen as skills and knowledge that an individual possesses and which can be enhanced via formal education with particular emphasis on entrepreneurial learning processes. (Gibb 1993) We argue that teaching entrepreneurship is also possible via distant learning programs. The aim of this article is to discuss and analyze our own experiences in teaching entrepreneurship and to present the two different models used in distant learning of entrepreneurship.

The contents and methods in entrepreneurship programs are depended upon the particular educational aims that differ from country to country. Entrepreneurship education can be divided into three different aims) starting up a business or enhancing the management of a business, 2) enhancing the knowledge on entrepreneurship and business, and 3) enhancing the entrepreneurial behavior (Hytti *et al.,* 2002). In this presentation we describe the two programs on entrepreneurship primary in the context of the first and second study objectives.

Description of the framework

In these study programs we have decided to produce different kinds of ICT-solutions for different educational levels. The decisions have been based on the following criteria:

1. specific study objectives for each study module (higher education vs. upper secondary school);
2. the available resources (expertise of the teachers, technical support);
3. the available technique (WebCT vs. tailored open learning environments) and
4. the repetition and transferability of the study materials and learning environments.

Special focus is on the communicational solutions which are currently considered as essential ingredients of study programs of high quality. According to our practical experiences, basic information on entrepreneurship and business management can be delivered and studied independently via Internet. The key issue is then the relationship between the study material and the independent student. In turn, the study modules that require the students to deliver elaborate plans or reflections on entrepreneurship require tutor and peer group support during the study process.

Our main challenges have then been to design a model for 1) study module based on collaborative learning process and creation of shared expertise for university students (emphasis on student-student and student-teacher relations), and a model for 2) enabling and supporting independent and self-directed learning based on structured courses for upper secondary school students (emphasis on student-contents relations) (see also Anderson 2004, Moore 1998).

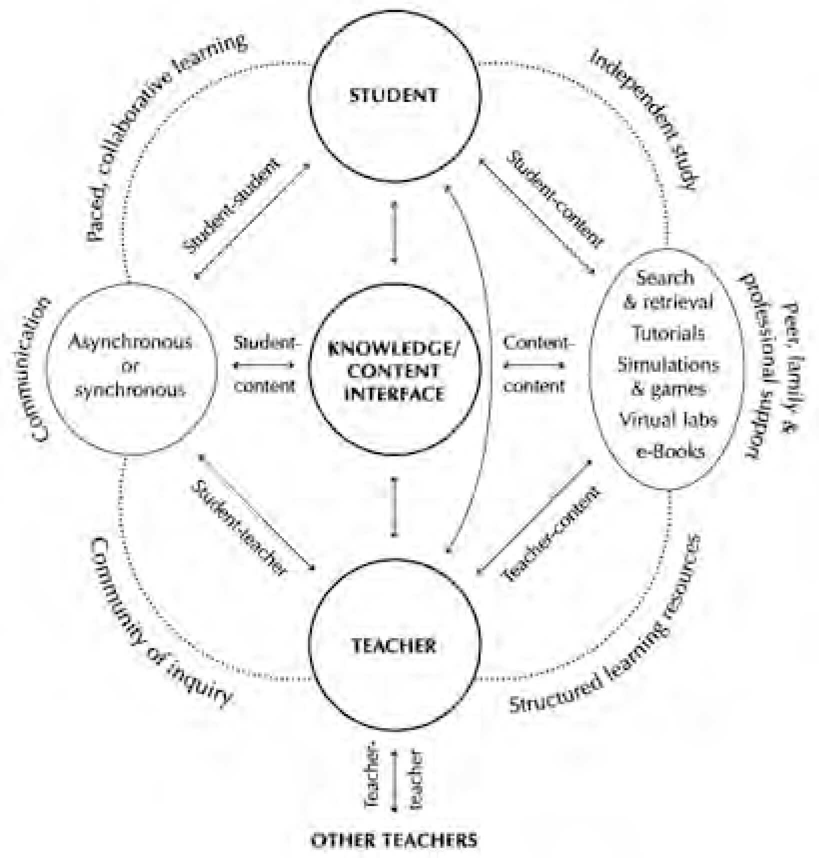

Figure 1. A model of online learning showing types of interaction (Anderson 2004)

Figure 1 illustrates the two major modes of online learning which are also the basis of educational solutions: the model illustrates the two major human actors, learners and teachers, and their interactions with each other and with content (Anderson 2004).

Description of the distant learning programs

"Entrepreneurship in the Society" – study module (University level studies)

"Entrepreneurship in the Society" course is part of entrepreneurship studies offered to the Bachelor or Master degree students in the Turku School of Economics and Business Administration. It is a compulsory course for majoring students and an optional course for students doing their minor subject in entrepreneurship. The aim of the course is to increase the knowledge regarding entrepreneurship as a part of society. The idea is also that the increased knowledge will help the student to see entrepreneurship as one career option. The course deals with issues such as the different support systems and organizations and the role of government in enhancing entrepreneurship.

The role of the e-learning in the course is very important as the course is almost totally carried out in a virtual learning environment (WebCT) and the course only includes one contact lesson. The study material is distributed via virtual learning environment, where most of the course activities also occur. The course is scheduled and the students work synchronously according to the same study plan.

The course is based on collaborative learning process. The course includes a couple of essay-type of written assignments and based on these assignments the students discuss as one group or as minor study groups in the virtual learning environment. The idea is to facilitate the exchange of ideas and the development of new shared knowledge among the group of students. The role of the teacher is to support and to follow up the learning process. The students also assess their own learning and support each other in the learning process.

DIEPES – Distant Education Program on Entrepreneurship in the Upper Secondary Schools in Finland

DIEPES – Distant Education Program on Entrepreneurship in the Upper Secondary School in Finland was launched as a national program in 1998 by YLE – The National Broadcasting Company in Finland and the Finnish National Board of Education. Study module has been originally produced as a self study material for whole of Finland and the material has been available on the Internet free of charge. All upper secondary schools have been able to download the materials and adapt the model for their own use.

Aim of the study module is to enhance the knowledge on entrepreneurship and business. The study module is divided into six courses:

1. Entrepreneurship and the individual;
2. Business;
3. Business Dynamics;
4. Production and Marketing;
5. Entrepreneurship in the Society and
6. Trends of Entrepreneurship.

The study module is based on flexible self-study method and requires independency from the student. Students are able to enrol the study module whenever they want (non stop) and choose the particular courses that interest them the most (1-6). The teacher acts mainly as a tutor for students studying asynchronously. Students are not in contact with other students, only with the tutor and interactive study material.

Study module is heavily based of multiple ready constructed study materials: educational television programs, educational radio programs, hyper texts, different kinds of tests, simulations etc. All of the material is available via Internet and the student does not need to purchase or look for any other study material. All courses include written assignments that are evaluated by the tutor or other specialist. The student gets written feedback from all of the assignments he has done.

Some conclusions

Both the collaborative and independent study methods have been applied in the entrepreneurship study modules successfully. For instance, by supporting the sharing of expertise and knowledge the study group can create and gain more understanding and knowledge than an individual learner by himself could. In addition, both learning methods enhance the development and growth of entrepreneurial characteristics in the individual learner. Methods in collaborative learning such as discussions courage the learners to question and be critical. Independent self study method enhances the independency and initiative of the individual learner.

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THE CONTRIBUTION OF CULTURAL HISTORICAL ACTIVITY THEORY IN ANALYSING VOCATIONAL E-TRAINING OF OLDER WORKERS

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Introduction

This study draws attention to the challenges to workers embodied in the transition from the industrial society to the knowledge-based society [22, 21]. The focus is on workers, rather than unemployed people, since I want to investigate the activity of training conceptualized in the frame of lifelong learning (LLL), as defined by the European Commission [8]. My aim is to study the structure of motivations which could be less obvious and linear in the case of workers than the one that is brought about by the need of finding a new job in the case of unemployed individuals.

In particular, the research looks at vocational training using Information and Communication Technologies (ICT) as one of the changes required to workers in the historical transition from an industrial towards a knowledge-based society. I deem that the older workers are the most challenged ones by this transition. Their personalities have developed through a good deal of experiences accumulated along life and maybe are less prone to changes now. Moreover vocational training provided through the use of ICT (e-training) may be even more challenging for older workers, owing they appear to be underrepresented among users of PC [1].

More generally, older workers attending e-training represent a case of the wider issue of the relation between ageing and innovation. It is widespread among scholars the consideration of ageing as a possible obstacle to the introduction of new technologies in workplace [10]. Such a question is relevant in societies – most of the ones in Europe – where the workforce is being transforming by a decrease of young people and an increase of old ones.

In this study ageing is conceptualized taking into account that different cohorts of workers may grow older in different ways and that the issue of training older workers might change over time.

The research is in progress and has been developed under the supervision of the School of Lifelong Education and International Development, University of London, as doctoral work. The results of the investigation consist so far in having shed light on the contribution of Cultural Historical Activity Theory to frame the analysis of vocational e-training of older workers. The following paragraphs aim to discuss this. Firstly, I point out how the transition from an industrial towards a knowledge-based society can be challenging for older workers. In the second paragraph I state the characteristics of the theoretical approach needed to analyse such a challenge. In the third paragraph I outline Cultural Historical Activity Theory (CHAT) which allows going beyond the behaviorism and cognitivism, and connecting the transformations of the contexts and individuals, as an interplay. In the last two paragraphs I sketch how the adoption of CHAT frames my investigation. Firstly, it stresses the relevance of the culture developed by older workers through the activities in which they have been involved so far and how this culture can also shape the other subjects of the vocational system. Then analysing vocational e-training as an activity highlights the tension between social and individual goals, and how these latter can develop consistently to the former. The social integration of older workers can play a primary role in the development of consistency between social and individual goals.

The data collection will investigate these issues empirically.

Socio-economic transformations in work activities and life styles

The age in which we are living is characterized by a high speed of innovation in the development of information and communication technologies and by the consequent changes in organisational and fundamental aspects of the social and economic systems. The ongoing transformations seem deep, multiplex and pervasive, crossing the boundaries of the countries, regions, institutions, social groups and classes, involving and affecting the lives of people of whatever status, ages and conditions [14, 5].

This phenomenon – usually referred as globalisation – is bringing about a different labour division in the world. In the most developed countries the old form of industrialism based on manufactures has rapidly contracted under the pressure of the increased competition from the emerging countries in the East and South of the world. This process is provoking deep transformation in the labour market, with the decrease of traditional jobs and an increase of jobs new in their form and content. The more advanced economies abandon the traditional industrialism and develop a new one. Castells terms this new emerging form of industrialism as *informational industrialism*, referring to "…the attribute of a specific form of social organisation in which information generation, processing, and transmission become the fundamental sources of productivity and power" [4]. The skills needed in the economies centred on informational factors of production are claimed to be higher than in the one based on traditional and – following the ongoing innovation – are continuously shifting and changing. Not all scholars agree with this assertion and some points out that only a part of the jobs is involved in this process [3, 23]. Nevertheless in the informational societies the traditional manufacturing employment is declining while managerial, professional and technical jobs are increasing rapidly [17].

Both types of changes (changes due to the transition from the old industrialism and changes intrinsic in the dynamic characteristic of the informational industrialism) challenge the identities and have strong impact on the lives of the workers, especially on those of the less skilled ones, working in sectors in transformation.

In European Union (EU) vocational training is promoted as one of the strategies to increase human capital and build the most competitive and knowledge-based area in the world. Such a target has to be reached by the Member States in an inclusive fashion, reducing the exit of older workers (55-64 years old) from the labour market [20, 8, 9]. Moreover in the EU documents emphasis is given on e-learning [13].

My hypothesis is that vocational e-training is challenging especially for older workers, since it involves their structure of motivations and goals, calling for changes to which they could be less prone than other workers.

I have chosen to conduct the study in a European region characterised by a shifting process from manufacturing to informational industrialism, with an advanced process of ageing and the need – in the frame of the European Employment Strategies – to increase the rate of employment of older workers. The chosen region – Piedmont – belongs to Italy, and it is characterized by a transition from an industrial toward a knowledge-based economy.

Contexts and Individuals: a separation to overcome

The hypothesis of this research is that one of the crucial components involved in training is personality. I deem that context has to be considered as an essential element to understand personality. On the other hand I want to avoid a dualistic view such that individual and context appear as two separate entities. The choice of activity as the unit of analysis – instead of older workers or contexts – seems a profitable way to concentrate on connections and processes among elements belonging to the same system. Therefore I need a theoretical approach to analyse training as a complex activity. Since the focus is on training using ICT, I also want to emphasise the role of this new kind of artefacts in learning.

Therefore I adopt the Cultural Historical Activity Theory (CHAT), which allows conceptualising:

- Training as activity which involves not only the individuals, but which is shaped by a system made up of different elements, defined by historical social relations, unified in a single process of development.
- ICT as artefacts which – with other artefacts – mediate between the older workers as learners and the activity's object of acquiring new knowledge and skills. CHAT makes distinctions between use of familiar and unfamiliar tools, linking these latter to issue of developing motivations.
- Personality as the space where social goals combine with individual goals, stressing the relevance of the meaning and signification the individuals attach to them. In my research the social goal is lifelong learning, while the individual ones are specific of each older worker.

Since such an approach seems to lack of a conceptualisation of power, I also draw my theoretical perspective on the Giddens's theory of power [15, 16].

Outline of the Cultural Historical Activity Theory

The underpinning concepts of CHAT, in particular activity and practice, stem from the philosophy of Karl Marx [24]. It was the Soviet psychologists who carried on Marx's analysis to develop a historical approach to psychology and the study of activity and its structure [18]. From the work of Vygotsky, Leont'ev and Luria, who developed the Activity Theory, it descends the current school of thought called Cultural Historical Activity Theory (CHAT). This theoretical perspective puts activity at the centre of its speculation, and conceives the social world of activity in relational terms. In such approach the unit of analysis is the activity as a system, made up by the subjects and the object of the activity. The actions of the subject are object-oriented and 'mediated' by artefacts such tools and signs, as products of the historical development of the human species and its civilisation [11].

The central problem of this approach is the relation among mind, activity and world. The scholars who refer to this threat of thought lay special emphasis on the interplay among mind and world through activity and its artefacts, in the service of goals [7]. That implies a dialectical reciprocal transformation between the Self and the context, going beyond the behaviorism (focusing on environment), cognitivism (centred on psychological processes) and ontological separation between persons and environments. Adopting this view means to conceptualise learning as an ongoing activity that coincides to the relation between changing individuals and changing social contexts [2]. Therefore learning is made of processes of transition and transformation of knowledge, skill and personalities and considering learning bounded to activities in educational and training systems is reductive. Learning is continuous transformation of knowledge, skill and personalities across various forms of social organizations, which sees individuals and artefacts interplaying in historically shaped social relations. The whole of artefacts developed over the human history and linked to specific activities constitutes the culture, which the individual masters in her ontogenetic development.

The e-training of older workers: taking into account culture and life course

In CHAT the strict relation between mind and activity is mediated by artefacts – both material and ideal – which contain in their shape the way in which other people – in the past or in other contexts – have answered to their needs.

The analysis of older workers and e-training is framed on the base of this perspective, which allows seeing the manner in which the older workers participate in the e-training as linked to the lifelong process of interaction between them and the activities, mediated by artefacts. Their minds – which comprise also extension of their bodies – have been shaped by the activities in which they have been involved so far.

Socio-economic activities in Piedmont are changing and moving from an industrial mode towards a new one based on knowledge, communications and information. Therefore in Piedmont activities can refer to one of the two modes, or to both of them, in a mix in which industrial or knowledge-based cultural elements (artefacts) can coexist. Older workers have mastered industrial culture in their life so far and they bring this culture in the activity of vocational e-learning. Nevertheless they are also changing their mind in interaction with the changes that occur around them and they can be involved in these changes in different ways.

Taking this stance, I expect the following evidences from the fieldwork. First the older workers' approach to e-training could refer to material and ideal artefacts of industrial matrix, but also to ones of knowledge-based mode. Secondly, and related to the last point, since participating to new activities – such is e-training – can bring about a process of appropriation of new artefacts, the appropriation of these latter can be challenging because they are in contradiction with previous knowledge, habits, practices. On the base of Leont'ev's view of personality, the older workers can accept such a challenge if they can make sense of this [22].

From CHAT view, the older workers are not the only ones to be shaped by the culture they have come to use through industrial activities. The other subjects of the vocational system such the teachers, tutors, civil servants, policy makers, union officers could show an industrial culture, mixed up with new elements coming from the transition of the economy. This can increase frictions and disagreements among the subjects involved in the vocational system and makes more difficult for the older workers to make sense of the e-training.

Social and individual goals in activity

Using CHAT, and in particular Leont'ev's work, can also highlight the tension between social and individual goals. Leont'ev sees activity as the uppermost level of human activity, collective and driven by an object [12]. The object of an activity is its true motive, which is to answer to one need or another [18]. The middle level of human activity is actions to achieve the object of the activity. Actions are driven by goals, which do not coincide with the motive of the activity. The motive arouses actions, but the actions are directed toward a purpose. The conditions and the tools of action afford the methods for accomplishing the action, which are at bottom level of the activity and are indicated also as automatic operations.

Behind this idea of three levels of activity there is the division of work developed to achieve a collective goal [19]. This collective goal is directly linked to a motive and a need to be satisfied. The goals of actions are not aimed to answer directly the need. It is needed the cooperation of all participants to satisfy it.

In my research, a vocational e-training course, funded by the European Social Fund, can be seen as an activity system to achieve the Union's strategic goal of the development of new knowledge and skills, aroused by the motive "…to become the most competitive and dynamic knowledge-based economy in the world" [20]. Nevertheless, in the European recommendations to the Member States to implement lifelong learning policies, it seems that it is implicit that such a goal is shared or can be easily shared by all the subjects involved in the system, workers included [8]. Leont'ev draws our attention to the fact that rarely the motive of an activity coincides with the subjects' goals [18]. Human beings can act towards goals that do not coincide with the activity's motive, since the result of their actions is linked to the final outcome of the activity by the social relations with the other members of the group, by virtue of which they get the part of the product of their joint labour activity [19]. As I can interpret, the subjects can be aware of participating in a collective work only if their relations are structured as relations of a group acting all together, moved by the same motive. In this case the link between the object of their actions and the motive of the activity can be comprehended by them [19].

To improve the effectiveness of vocational e-training, the goals of the older workers should be linked to the motive of the activity, which is building a knowledge-based society. However it is possible to image that there could be a wide range of individual goals which are related to the object of the course, but which could not have the same motive of the activity. Older workers have a hierarchy of goals [22], and these latter can develop consistently to the collective ones. Different degrees of such a consistency take form in the social network and activities of the older workers. If the older worker feels herself as a part of a cohesive network of relations, especially in her workplace, she can develop the sense of what she is doing, like vocational e-training. Besides, the more vocational e-training is meaningful for the older worker, the more she is able to work out the conflicts aroused by approaching new type of artefacts as ICT are. In Leont'ev's view, the making of the connective system of personal senses expresses the making of personality [6].

Conclusions

The adoption of CHAT allows a systemic view of the issue of vocational e-training of older workers, able to connect analytically the individual and context in the transition from an industrial to a knowledge-based society. This implies to investigate vocational e-training as an activity mediated by artefacts which belong to both old and new cultures, arising conflicts which can find a solution in the process of making sense and the formation of goals. In CHAT this latter depends on the social network of the individual and her feeling of social integration.

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“INCLUSION OF FEMALES IN ICT” – A LIFELONG LEARNING CHALLENGE FOR CHANGE AGENTS: BENEFITS OF INNOVATIVE E-LEARNING TOOLS AND TRAINING METHODS

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Abstract

Under-representation of women in the Information and Communication Technology (ICT) world is not a new phenomena, but a very persistent one. On the political level, the European Union has placed this issue on its agenda and postulates social inclusion and equal opportunities in a knowledge-based society, laid down in the e-Europe Action Plan. The Community Framework on Gender Equality 2001-2005 points out that a knowledge-based society cannot afford to under-utilize the enormous untapped potential of its female professionals.

Our particular project approach is to address the needs of all relevant *change agents* such as parents, peer-groups, youth workers, teachers, management staff of universities, career advisors, human resource managers and personnel developers who assist young women and female students along the multi-faceted ICT career path. We examined barriers and needs of this key persons in changing mindsets, stereotypes and role models of themselves and their clients and in particular how eLearning can support this life long learning process.

*e*Tutoring, *e*Coaching and *e*Consulting are methods that can help to attract more women into ICT professions. Professional gender-sensitive training and coaching can be offered with *innovative eLearning methods and tools*, particularly in relevant phases of women’s career planning. Innovative eLearning might raise the number of female employees in the ICT world and shape its future. The EU-Project PRO::ICT has taken up the challenge to develop, test and evaluate a collection of web based Training Material for gender sensitive teaching and consulting which takes account of the different demands of the users with eLearning environment and local contexts (e.g. as regards country specific job-profiling). These materials can be accessed via internet and experienced in an online course for “Gender sensitive teaching, training and consulting”.

1. Introduction

1.1 The problem

For some years Jacqueline Hey has been one of only a few women present at Information and Communication Technology (ICT) industry forums in Australia. “It has certainly changed in the last 10 years”, says Hey, director of the Vodafone customer unit at Ericsson. “Now there are 20 or 25 per cent there. So it’s still not an equal balance, but it’s certainly going in the right direction.” (Career one, 2004/1)

Representatives from the field of gender research and national labour force agencies reflect on the same picture of an unequal gender balance in computing all over the world. The cornerstone of these reflections can be traced back to three observations:

- Women are generally under-represented in ICT sector employment, counting an average share of 20-30% of the workforce in the European countries in the aftermath of the internet hype. Figures reproduced in this discussion need to be taken with care though because ICT jobs are not confined to the ICT sector, but also in other sectors of economy which use rather than produce ICTs (e.g. finance sector). The weak statistical indication at European level is due to the fact that the categorisation of ICT professions differ from country to country (see Eurostat, data from the Labour Force Surveys (ISCO/NACE) http://europa.eu.int/comm/eurostat/, and also see http://www.ict.org).

- Women are even more under-represented in ICT core professional occupations and still do not reap the benefit from higher skilled and higher rewarded jobs such as IT professionals and engineers. Data from the United Kingdom indicate that 1999 was a peak year for women's employment in the professional areas of ICT occupations (20%), but since then the number declined (Millar and Jagger 2001).
- Women have technical competences and gain enjoyment from working with computers, but still seem to slip away from the ICT career domain. This can be observed by the low participation rate in professional computing courses and academic studies and high number of patchwork careers and drop out rates. Those women who enter the male IT world, do not find working conditions attractive and therefore tend not to follow a continuous ICT career path (Millar and Jagger 2001).

1.2 Explanation of this phenomena

The research community searching for explanations to this problem has grown rapidly during the last few years involving experts from fields of educational science, psychology and gender studies. The experts have a unanimous agreement that it would be too easy to suggest a single factor explaining the women's difficult situation (Margolis, 2002). Therefore, we would like to draw attention to three key issues that may have a decisive impact on the career and job situation of women in ICT. In this project these key issues are commonly referred to as the 3M-scheme: mindset – match – market.

Mindset relates to images, ways of thinking, attitudes and ways of dealing with ICTs, especially with respect to following an ICT career path (for example self-esteem, role models etc.).

Match relates to the transfer of these mindsets to conditions of access and educational environments in the field of tertiary education in ICT (for example curriculum, study environment, study profiles etc.).

Market relates to the move of graduates to recruitment strategies, demands and perspectives on the relevant labour market (job profiles, maternity leave strategies etc.).

2. The PRO::ICT Approach

The ICT career path spans over a ten year period in a woman's life (approximately from the age of 13 to 23 years onwards). Therefore, choosing a career is one of the most important decisions one has to make early in one's life. Given due consideration and bearing in mind the outlined three influential factors, the PRO::ICT project proposes a solution that would require not only a change in the mindset of a girl/female student, but also of all the persons and organisations involved in the decision process of promoting uptake of an ICT career path. It is only with a focused effort to change peoples mindset, and endeavour to avoid practical ismatches, and prepare the individual for a position in the IT world that there is a good chance for changing or improving the situation. We propose to introduce professional, gender-sensitive training and consulting along all stages of a woman's professional ICT career. These stages can be described in three main transition phases:

- Development of the idea of a technical ICT career path;
- Enrolment and study on computing courses and at higher academic institutions;
- Entry into an ICT company, which is often perceived with a male dominated working culture.

As lots of studies state the influence of parents and teachers in primary schools is very important regarding the development of mindsets of girls and boys as well as the effect of role models. Though to cover this specific period it would need another project, since the factors of influence are multi-various and require an approach that involves sociology as well as psychological and educational sciences.

Despite the differences in the educational systems amongst the European countries, the important milestones in planning a career would include the phases previously outlined which can be adjusted to the age of the female students.

Phase 1: Developing the idea of a technical ICT career path takes place around the age of 13 years. It is at that age that the first choice for specialisation in educational programmes is available (transition from secondary to tertiary education). At this stage peers have a high impact in informing the students' programme selection.

Phase 2: Enrolling on computing courses and studying computing courses at higher academic institutions at the age of 19 years (transition from tertiary to university education). Then the alternative choice about further education and/or entrance into vocational training has to be chosen at this stage. Parents, career advisors and image of potential universities essentially influence the decision process.

Phase 3: Taking the first steps into what is commonly understood to be a relatively male-dominated working culture may occur from the age of 23/25-27 years when graduating from university. These graduates make the transition from tertiary education to employment and vocational training (transition to work).

3. Methodology

Following the approach described earlier, the project applied diverse instruments of socio-economic research:

- Desk research – secondary material of studies from the fields of educational, psychological, social and socio-economic research;
- Interviews with girls and students representing the three transition phases at all age levels;
- Interviews with change agents from different European countries involved in the three transition phases such as teachers, educationalists (UK), human resource managers (Austria/Germany/Switzerland/Denmark) and consultants who play a (non-profit-oriented) role in the vocational guidance process (Netherlands/Bulgaria).

The findings relate to the countries involved in the project and thus it is possible to highlight country-specific problems (e.g. low rate of female ICT work force in rural areas e.g. Denmark and Welsh region; vocational career advisory systems in the accession countries or reformed communist countries e.g. Bulgaria).

4. The findings

The findings of the study strengthened the idea of providing support for the change agents in all transition phases in the first place. Those who may be able to induce a change, need more support in how to design and provide interventions useful over a longer period of time! Thus, keeping the recommendations in mind, we propose to professionalise online training and consulting activities in the relevant phases of a girls' career planning. One important step towards this aim is to provide relevant inputs and resources for change agents. Thus, one of the project result is a collection of innovative, gender-sensitive training material which should be used in practice by the various change agents in their daily working environment. This collection of gender-sensitive training material includes approximately 50 descriptions of sensitivity material, workshop designs (including e-learning courses), information material about the ICT market and occupations, handbook and guidelines for organisational interventions and case studies of successful gender-sensitive training activities. The change agents can either use pre-defined workshop programmes customised to specific learning objectives. However, it is also possible to select single training items and create a tailor made training programme as to the specific needs of the learner group.

Besides the training material description, the PRO::ICT database offers also the material for download and with this service we hope to encourage usage on an European-wide scale. The gender-sensitive workshop programmes and e-learning courses will be publicly available on a Web-based learning environment at: http://www.pro-ict.net.

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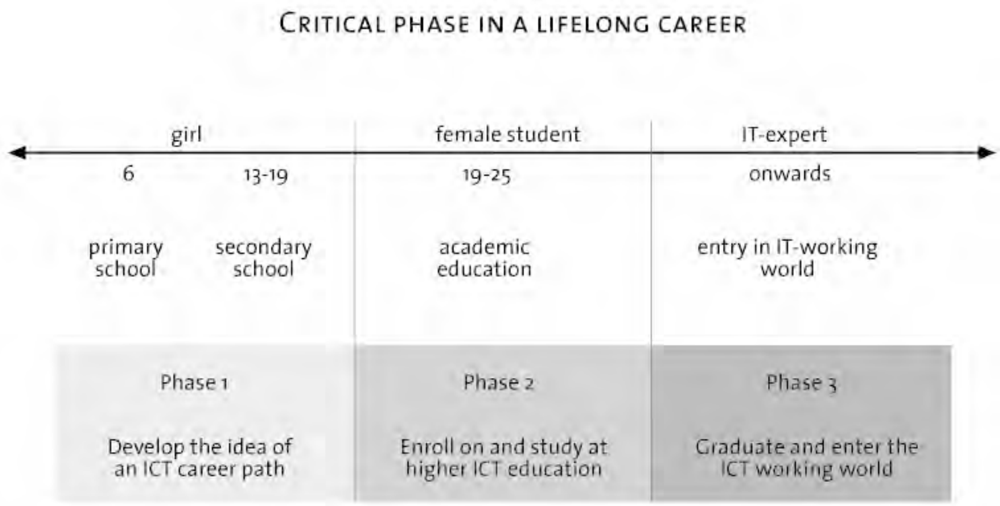
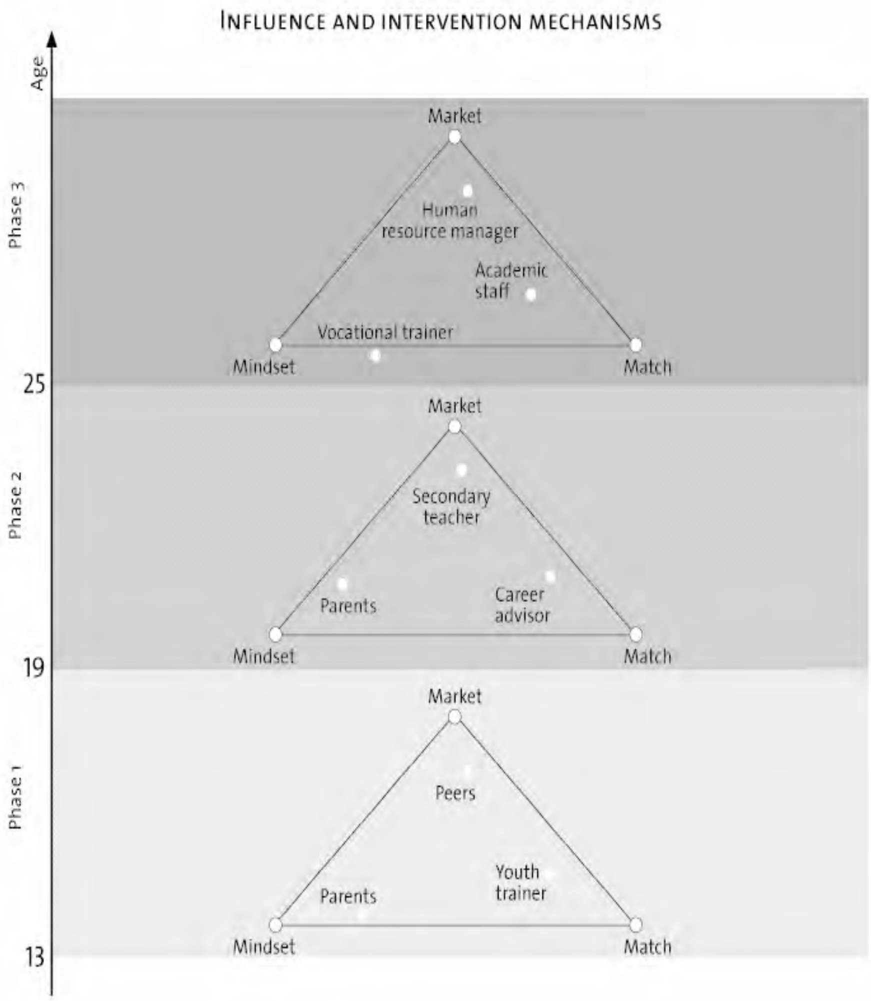
Screenshots of Lifelong Learning Approaches and PRO::ICT Result

Study for download at: www.pro-ict.net

How to capture life long learning challenges – methodological approach?

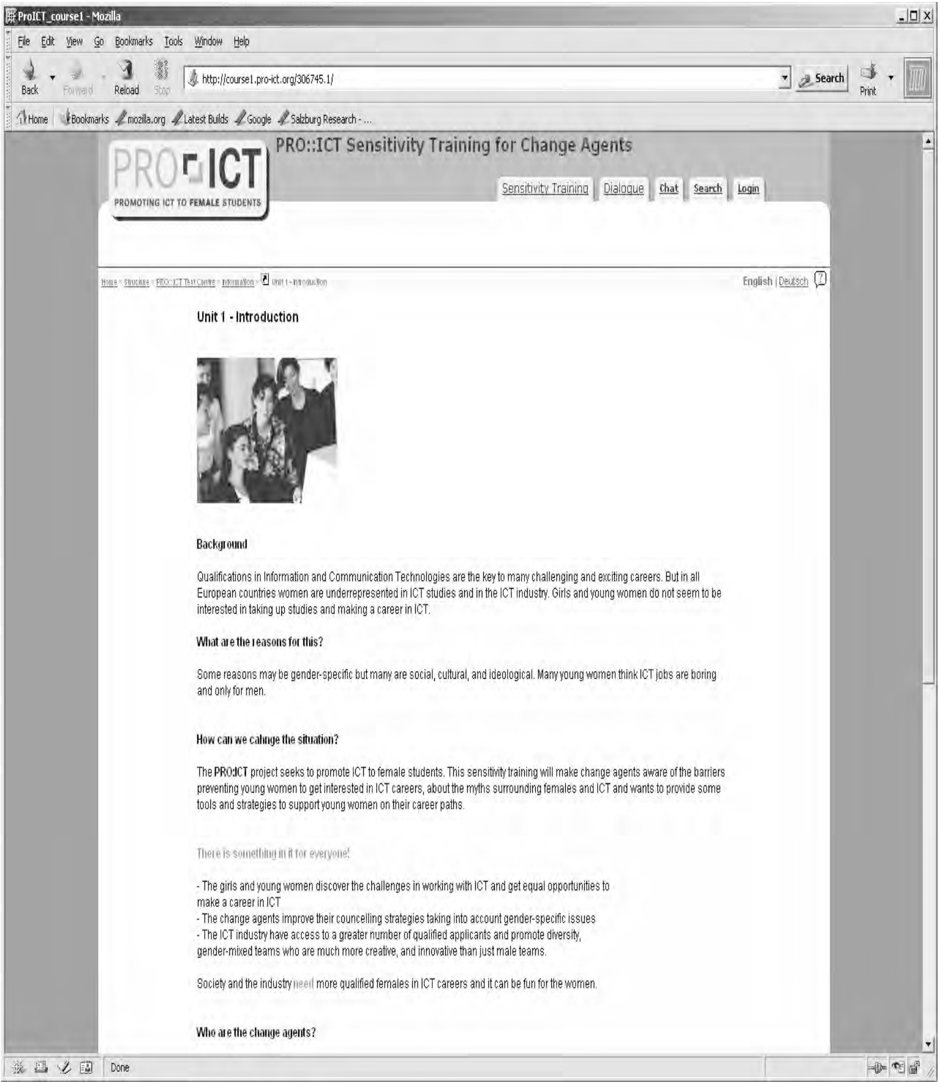




eLearning Challenges:

How to handle different user demands deriving from:

- diverse use of eLearning environments;
- different tool knowledge (e.g. authoring tools, collaboration tools);
- media literacy of user groups, and
- need for integrating localised eContent production?



SKYWATCH – INTRODUCING EUROPEAN YOUTH IN THE WORLD OF SCIENTIFIC RESEARCH THROUGH INTERACTIVE UTILISATION OF A GLOBAL NETWORK OF ROBOTIC TELESCOPES

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Abstract

The SKY WATCH project is introducing the European youth in the truly wondrous world of science and technology by engaging school and university students as well as young science amateurs in escalating, challenging and innovative multidisciplinary 'Science Games' combining creativity, intelligence and scientific quest. SKY WATCH introduces a pan-European Science Communication and Celebration Initiative, which will reach its peak during the European Science Week 2005, comprising of two main interrelated events. A two-phase European Science Contest concluding to a central European Exhibition and a Best Projects Award Ceremony and a series of popular science distance learning courses (16 'Science Days' overall). To perform project activities, young people are given access to an existing global network of five remotely-controled robotic telescopes though the innovative web-based platform 'EUDOXOS' that is currently in use across Europe. The young participants are prompted to organize teams and accomplish science projects, comprising astronomical observations with the use of the telescopes and under the guidance and support of experts. The SKY WATCH web-portal launched for this scope is providing access to EUDOXOS Platform, to advanced collaboration and communication tools and educational material of high added value, acting as on-line campus for scientific quests. An Integrated Publicity Campaign covering 28 European and other Countries is implemented. At least 10,000 secondary school students of 28 European Countries, 1,000 university students, 50,000 visitors of science centres, parks and museums and 5,000 visitors (mainly school students) of the central exhibition are expected to participate in the activities of the project. In addition, among the targets of the project is the organisation of an Annual European Award Competition in science and technology and especially in astronomy and physics as well as an Annual International Exhibition where the best results of the competition will be presented. The establishment of a Virtual Community of young people, wider public and the scientific community is the ultimate project objective.

1. Introduction – Objectives

The aim of SKY WATCH project is to build on the youngsters involved in a series of science projects in order to create a virtual community of young prospective researchers promoting scientific culture. The SKY WATCH project is providing the opportunity to the European youth to access and use remotely-controlled robotic telescopes in real time, perform observations, analyze data and results and finally develop and suggest solutions and provide answers to selected research – scientific topics. This is achieved through the utilization of an innovative web-based learning environment, the EUDOXOS platform that is already in use from many schools across Europe in the framework of their school curriculum. The dissemination of the projects activities will also be served through a European Science Contest on science topics and projects, a series of popular science distance learning courses (Science Days) for the European youth, promotion of concepts and ideas of science of a multidisciplinary nature: physics, mathematics, statistics, chemistry, etc. The young participants are prompted to organize teams (school classes, groups of students, etc.) and design, develop and implement projects and activities with the use of robotic telescopes under the guidance and the continuous support of a team of experts in the field.

2. The SKY WATCH Project

Sky Watch project[1] deploys an innovative approach aiming at promoting increased public scientific and research culture. This approach targets to crosscut the boundaries between schools, research centres and science thematic parks and involve users in extended episodes of playful experience and scientific research. The project through its science and technology advances targets to create a 'feel and interact' user experience, allowing for the development of an increased scientific culture open to societal changes and at the same time adequately modulated to the needs and capabilities of each user. Sky Watch approach will engage groups of young people all over Europe in a scientific quest by implementing a set of multidisciplinary scientific scenarios related to astronomy and astrophysics. Young people are given an opportunity to perform and experiment with scientific research and evaluate its impact on society and everyday life. Sky Watch will not act simply as a science demonstrator but primarily as an interactive and vivid initiative where users equipped with powerful real scale research tools are becoming the researchers, the seekers and finally the leaders of the scientific quest.

SKY WATCH also provides the opportunity to the young people of Europe to experience the benefits arising from European co-operation in research. The fact that the state-of-the-art instruments and the communication tools are developed by joined trans-national research collaboration is highly demonstrated to every participant and user of the project's activities. Under SKY WATCH activities, a powerful European educating and entertaining network will be established. More specifically, school and university students, researchers and scientists as well as the wider public are forming a Virtual Community. Around 50-70 European Schools from 28 European Countries and 30 Universities and Science Centres are participating in this network. Young people are given the opportunity to learn and to be familiarised with the process of trans-national scientific research by performing real life scientific quests, collaborating in science projects with students from other countries, participating in Science, taking Interactive Popular Science Courses and communicating with experts, researchers and teachers from all over Europe.

3. Implemented technology

The service is interconnecting a network of remotely-controlled telescopes that includes the two telescopes of the National Observatory of Education EUDOXOS located on Kefalonia island in Greece, the Liverpool Telescope (the largest robotic telescope in the world) located on the island of La Palma in the Canaries and the two telescopes of the Observatory Science Centre at Herstmonceux (UK) with more than 100 schools from different European countries are connected to the telescope and performing day and night observations facilitating the two telescopes of the Observatory. The SKY WATCH software platform, based on the EUDOXOS platform, is inherently a distributed system as the observatories are distributed across the globe. Each observatory hosts at least one telescope server to store information that is local and relevant to each telescope at that observatory, including telescope properties, schedule, and availability. This information is stored in a virtual telescope object. There is also a main server that houses, the SKY WATCH platform, the scheduler and the polling and updating agent, which communicates with the robotic telescopes (Figure 1).

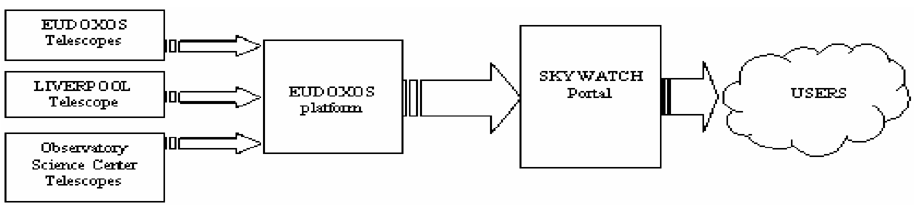

Figure 1. Operational scheme of the Sky Watch web portal

[1] The Sky Watch project is co-financed by the European Community, within the framework of Science and Society, FP6-2003-7-013609. The Sky Watch consortium is composed by the following partners: Q-PLAN (GR), EDEN Open Classroom (UK), Astrophysics Research Institute (UK), European Physical Society (FR), Ellinogermaniki Agogi (GR), Stockholm University (SE), SCIENCE PROJECTS (UK) and University of Duisburg – Essen (DE).

The web platform is composed of four main features, the Web services, the Communication platform, the Observation Area, the Upload Mechanism for managing the telescope resources and the Resources Database/Library. The access to the tools requires registration. The Web services offered by the SKY WATCH Web Portal include:

Main Content & Functionalities of SKY WATCH portal
• Information on the contest and on the project • Supportive material and research results for the users – participants • Discussion forums • On-line supporting sessions & educational material • Electronic newsletter • Information and links with Science Week portal and with other science projects • Support creation & operation of virtual learning communities • Connection with and use of EUDOXOS platform (interconnection with the network of the 5 telescopes for observations) • Special utility to support presentation of the Interactive Popular Science Courses (within the context of Science Days activity)

The Communication Platform serves one of the main aims of the SKY WATCH project which is to move students and young researchers into scientific research. Thus, just as in the professional world, a request for an observation must come as a part of a project, which includes all the steps of the scientific investigation (hypothesis, experimentation, analysis of the data, conclusions). In the framework of the project a scientific question is posed and the learner seeks to answer and outlines the observations to be made to address some aspect of that question. In some cases the users come to the web platform having already decided the scientific questions and the associated observation requests. In many cases, however, they have not. In these cases the web platform guides learners through the process of asking a question, providing a dynamic view of available information based on their choices along the way. The Communication Platform includes:

- Collaborative activities for on-line users: These activities are offered through:
  - Chat activities
  - Groups (e.g. teachers and students)
  - Direct Dialogue facilities
- Advanced Messaging Services and Interactive activities: that allows for a) communication between the user and an expert (e.g. astronomer) as well as among the users, b) users to participate in learning experience, c) interactive project preparation (formulate a question, define observation, reporting and presentation of results, review) and d) notification services about new available educational scenarios etc.

Through a very simplified procedure every participant is able to perform an observation or to submit a request. The user has the possibility to choose the telescope according to the needs of the observation. Additionally, the user has to check the weather conditions in the area through information provided by the SKY WATCH Web Portal.

4. The SKY WATCH Web Portal

The SKY WATCH portal is developed in the English language in order to facilitate the whole process. The contest participants have the possibility to find information (the competition guides, the evaluation criteria, description of the selection procedure), all the needed research results that already exist and supportive material. It additionally includes an up-loading mechanism that allows for the contest participants to up-load their projects. Discussion forums and on-line support sessions are created to facilitate the whole process. The contest participants will receive a regular electronic newsletter throughout the duration of the project to keep them updated with activities in all science projects and interesting new items posted on the SKY WATCH portal to create – support virtual learning communities of young people, educators and researchers and involve them in extended episodes of scientific inquiry. The virtual communities of learners, students, teachers and researchers are involved in the proposed activities through the SKY WATCH portal. The SKY WATCH portal provides an online campus with well proven products and tools such as: multi-lingual repositories of educational material (in the framework of the EUDOXOS project and the Schools Observatory project a significant number of scenarios and educational material have been already developed and is already in use by school students and their teachers in Europe, Japan and the U.S.A.) as well as communication and collaboration tools. The SKY WATCH portal is directly connected with the EUDOXOS platform, in order to take advantage of all the material and the data that already exist. A special utility is developed in order to support the presentation of the Interactive Popular Science Courses delivered to the young participants and to the wider public. The portal is acting as the meeting place of the virtual community of young prospective researchers. They should become the promoters of the best practices and contribute to the final validation for products and criteria. The portal evolves in parallel with the projects' life cycle and it is being regularly updated with all the latest information about the contests, the courses and the Science Days.

The Upload Mechanism supports users for presenting their work on the web. The SKY WATCH platform uses a multimedia database system (Library) for storing and retrieving the multimedia knowledge data that consists mainly of text and images. Examples of resources include projects, lesson plans, educational material for teachers, images. As each resource comes into existence, its components are encapsulated in XML and are further annotated with appropriate metadata protocol, to permit queries for future use. The database stores and manipulates the following knowledge data types:

- The images of the astronomical objects;
- The mapping information between images of real objects and knowledge data scenarios;
- The knowledge data scenarios of the e-learning experiment;
- The multimedia objects (text, audio, images, video) composing the knowledge data scenarios.

Following the "open systems" philosophy, the SKY WATCH Database allows for maximum access and use by the educational and scientific community by embracing technologies which promote interoperability, such as XML, and RDF. The system is built on open web standards, facilitating use by new users and integration of new telescopes.

5. Scenarios for science projects

As the proposed activities are open for different categories of users (secondary school students, university students, young science amateurs as well as the wider public, e.g. visitors of science parks) the scenarios of use vary significantly in order to cover the different needs and interests. The scenarios address science topics from multiple viewpoints and are also integrating other fields of science including social, human and economic sciences. These scenarios are one of the basic vehicles for the promotion and the dissemination of science and technology to the young participants. The scenarios are categorized in two main groups. The first group includes scenarios for the specific educational purposes of the school or university curriculum (scenarios to be used in formal learning settings). The second group includes more open scenarios as they are designed for the wider public (e.g. the visitors of a science centre). The young participants organize teams (school classes, groups of students, etc.) and design, develop and implement projects and activities with the use of the telescopes and under the guidance and the continuous support of a team of experts in the field. All the projects will be presented and assessed following specific criteria applied by the project's scientific committee. The consortium of the project has set up the evaluation methodology and the selection procedure adopted during the contest.

The content of the scenarios is presented in an open and modular way allowing for additions and improvements at any time. The activities offer the users of the telescopes the possibility to study interdisciplinary concepts of physics, mathematics and astronomy by using a modern research laboratory, allow students to study and teachers to support the learning process.

6. The SKY WATCH Contest

The first phase of the Science Contest starts with the selection of the scientific topics by the participants and it is completed with the submission of the final results – deliverables. The contest participants are asked to create scenarios and well-defined small projects to express these ideas and to search for answers to these questions, with the prerequisite that all these projects will require the use of the robotic telescopes of the network to create the data and to subsequently analyze and interpret them, formulating their final answer or viewpoint that will conclude their project. The participants are asked to carefully design, develop and implement their projects and the activities involved for the execution of them, on the basis of the facilities that the SKY WATCH team will provide, both in terms of infrastructure (robotic telescopes, portal and databases) as well as guidance and support by the scientific team of experts that the SKY WATCH partnership will provide. In particular, for each topic that the SKY WATCH team has selected, a resource guide is developed that provides background information and learning activities, designed so as to engage students, groups and individuals in learning about the specific topics and designing their own projects to investigate further and learn more. This guide is available through the SKY WATCH portal. Participants have the opportunity to make a submission of preliminary results of their project so as to have a first feedback and guidance by experts.

Different contests are organised according to the age of the participants. Supportive material has been developed, such as contest guides, evaluation guidelines and rules of participation and forms the contest package delivered to all participants (groups and individuals). Additionally each scenario is accompanied with supportive material for the users. The material includes links to the normal school curriculum, guidelines, and sample worksheets for the students, as well as references and additional information for the wider public. The contest is realized in two different contexts, in formal learning environments (school or university students in the framework of their normal curriculum) and in informal learning environments (science parks, museums and centres, home). The participants have the chance to get involved in more complex activities by using images from the database of the SKY WATCH portal (e.g. during schools field trips that include educational projects).

An initial selection procedure will be established that will lead to the creation of a pool of 30 projects suitable for presentation during the European Science Week 2005 and for candidacy for awards of the best projects. This evaluation/selection procedure will be followed independently for each of the two groups (students and the wider public) of contestants, and in the case of students it will further be classified to subgroups according to age ranges. As a result of this stage, a detailed scientific dossier will be developed for each one of the selected projects, comprising the essential scientific knowledge, relevant information, and all the available material.

7. Expected impact – future plans

School students, university students, educational authorities, teachers, wider public e.g. amateur astronomers and relevant associations, visitors of science centres and science museums across Europe will participate actively on projects core activities and/or be aware of the demonstration – publicity activities in science and research topics in astronomy and astrophysics. Concerning particularly the participation of the young school students, SKY WATCH project is expected to actively involve them in the scientific process providing a hands – on experience of the scientific process. The "Science Contests" will constitute the driving theme and concept for attracting young people's interest on science to enjoy a 'feel and interact scientific experience' that involves learning, competition and entertainment and highlight the excitement of the scientific quest. Through the proposed activities the project aims to raise the European youth's interest and awareness on science and technology as well as to create and support virtual learning communities of young people, educators and researchers and involve them in extended episodes of scientific inquiry and science understanding. In the long run, the project targets to establish an Annual European Award Competition in science and technology and especially in astronomy and physics as well as an Annual International Exhibition where the best results of the competition will be presented in a different European city each year.

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ANALYSIS OF LEARNING COMMUNITY CULTURE AND EDUCATIONAL PORTAL NEEDS IN LITHUANIA

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Abstract

We analyze social aspects of e-learning community environments. We introduce the term 'learning community culture' as a specific case of the corporate culture. We suggest a model for analysis, understanding and measuring (at some extent) cultural issues in the context of the information communication technology (ICT) usage for teaching purposes. Our model contains several layers, each subsequent presenting more details. The paper describes also a framework for integrating the model with technical and non-technical issues in educational portal design.

1. Introduction

The success of e-based applications depends now not only on the maturity level of the information communication technology (ICT) but as well on how the individuals and organizations are prepared to accept, adopt and evolve their capabilities in using innovations. It is true, perhaps, at the larger extent to those applications, such as e-learning, distance learning, online learning etc., because the learning community can be regarded as the one, which is more motivated to meet the challenges of ICT.

In general, the human motivation to better exploit the capabilities of ICT and gain benefits for organization can be described as a part of what is known in the literature as *corporate culture* [1], *organizational culture* [2]. We apply this term in the context of the *learning (educational) community*. By the *learning community* we mean teachers, students both at the school and university level, their parents, school boards, administrators, curriculum designers and those who are involved in the lifelong learning programs, who act together to enhance the social, economic, cultural and environmental conditions of their community. The *learning community culture (LCC)* is not well-understood yet because it is a new phenomenon and the community itself is in the stage of formation and evolution [3]. But the importance of organizational culture with respect to ICT can been recognized because it already was discussed in various contexts [2, 4].

The aim of the paper is to analyze the various aspects of this phenomenon and bring an LCC model, which allows to some extent evaluation and measurement of the level of LCC to adopt ICT for educational needs. The proposed model has a wider context, the *meta-design* paradigm for creating e-learning environments [5], which is not the topic of the paper. The paper is organized as follows.

2. Related works

We categorize the works into two streams as follows: (1) relates with the topics in which the corporate culture is considered in the *ICT usage context*, mostly by learning communities; (2) comprises the culture issues in the *ICT developments* oriented to learning communities. The first stream includes also terminological issues.

1. According to Sullivan and Edvinsson [6], *culture* is a part of the intangible structural capital that supports the development and transfer of knowledge. In the paradigm [7], *corporate culture* is considered as an internal variable (something a firm has) which develops in the firm and can be influenced by management in order to reach certain objectives. Ernst shows that "the most efficient *corporate culture* is contingent upon environmental factors and the firm's technology strategy" leading to important managerial implications [1].

Davenport examines the *information culture and information behaviour* in the context of *information ecology* [8]. *Information culture* expresses an organization orientation towards information and innovation. D. Robey suggests that sharing and communicating of knowledge transforms *individual knowledge* into *organizational knowledge* [9]. Intranets (*organizational portals*, in our case) serve for knowledge management efforts because they allow the sharing document-level information and concepts or issues [10].

Dutta *et al.,* [11] introduce the *Networked Readiness Index (NRI)* to measure at some extent the role of the human factor in the information society. NRI is defined as a nation's or community's degree of preparation to participate in and benefit from ICT developments.

2. Ruppel and Harrington explore cultural factors affecting the implementation of intranets, i.e. knowledge management systems [2]. They measure culture analysing factors related with the four types of culture dimensions (group, hierarchical, developmental, and rational). They present a survey of IS managers and found that the intranet implementation is facilitated by a culture that emphasizes an atmosphere of trust and concern for other people (*ethical culture*), flexibility and innovation (*developmental culture*), and policies, procedures, and information management (*hierarchical culture*).

Fischer [5] proposes an approach to knowledge management that focuses on a *design perspective* in which ICT workers act as stakeholders creating new knowledge as they carry out their work practices. Fischer uses the term "*computational literacy and fluency*" and explores new conceptual frameworks and innovative computational environments that support people in becoming independent of "high-tech scribes". *Fluency with IT* is defined as "the ability to reformulate knowledge, to express oneself creatively and appropriately, and to produce and generate information rather than simply to comprehend it". Fluency goes beyond traditional notions of computer literacy by requiring a deeper, more essential understanding and mastery of ICT, and it is a prerequisite to creating a personal and deep relationship with media [12].

Cohen and Levinthal define the *absorptive capacity* as the organization's ability to recognize the value of new information, assimilate it and apply it to commercial ends [13]. Zahra and George [14] refine the definition of *absorptive capacity* as the routines and capabilities that enable a firm to acquire, assimilate, transform and exploit knowledge. Harrington and Guimaraes [15] examine the type of corporate culture that influences absorptive capacity.

We summarize the related work as follows: researchers demonstrate the links between an organization's (community) culture and its performance/productivity. They argue that the success of an organization's strategy depends, to a significant extent, on the culture of the individuals and organization.

3. Model for describing learning community culture

3.1 Framework

We start devising our LCC model from the framework, which in Figure 1 is described as a 3-layered structure consisting of (1) integrating environment, (2) context, and (3) models. In the framework, there are clearly separated non-technical issues from the technical ones. At a bottom layer, we represent the models, LCC and Portal needs, respectively. The basis for the proposed framework is the related works (see Section 2) and analysis of some educational portals of UK, Ireland, Luxemburg, USA, educational web sites of Lithuania and our study [16].

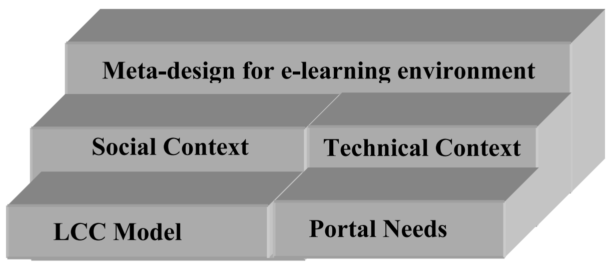


Figure 1. Meta-design Paradigm for E-learning

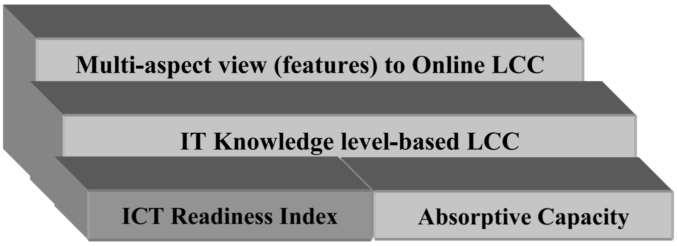
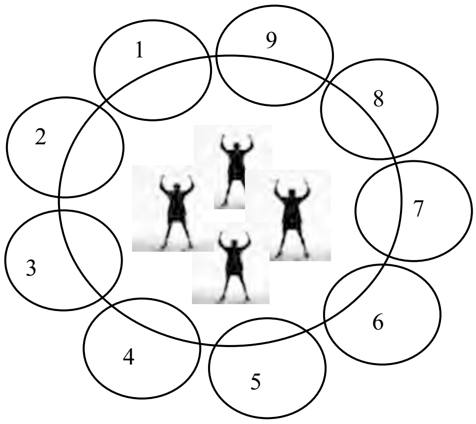


Figure 2. LCC Layered Model

We consider first the LCC model with respect to the meta-design paradigm in three layers (see Figure 2). Each level serves as a rationale for understanding of LCC dimensions. We will discuss the rest part of the model (Portal needs) later on.

Our vision of LCC is that the culture is a formation consisting of a variety of aspects (see Figure 3). We analyze the LCC aspects related to *human context* of the meta-design for the e-learning domain. Meta-design includes a process in which users become co-designers not only at design time, but throughout the whole existence of the system. Meta-design provides users with opportunities and tools and social reward procedures to extend the system to fit their needs [5]. People must be *motivated* and *learned* to become *knowledgeable enough to act with information and ICT* and as designers. *Social creativity* explores computer *technologies* to help people to work together and it is relevant to design because *collaboration* plays an increasing role.



1. *Human Knowledge about IT*
2. *Behaviour with Information*
3. *Collaboration*
4. *Learning*
5. *Motivation*
6. *Social Creativity*
7. *Human involvement*
8. *Technology diffusion*
9. *Others*

Figure 3. Multi-view approach to online learning community culture (LCC)

3.2 Analysis of the LCC model aspects and capabilities

Now we will analyze the basic aspects of the model only. *Human knowledge* is very close and related to behaviour with information. It is important to measure the level of knowledge the people posses. We measure human knowledge about IT using two dimensions as follows: *computer literacy and fluency.* We

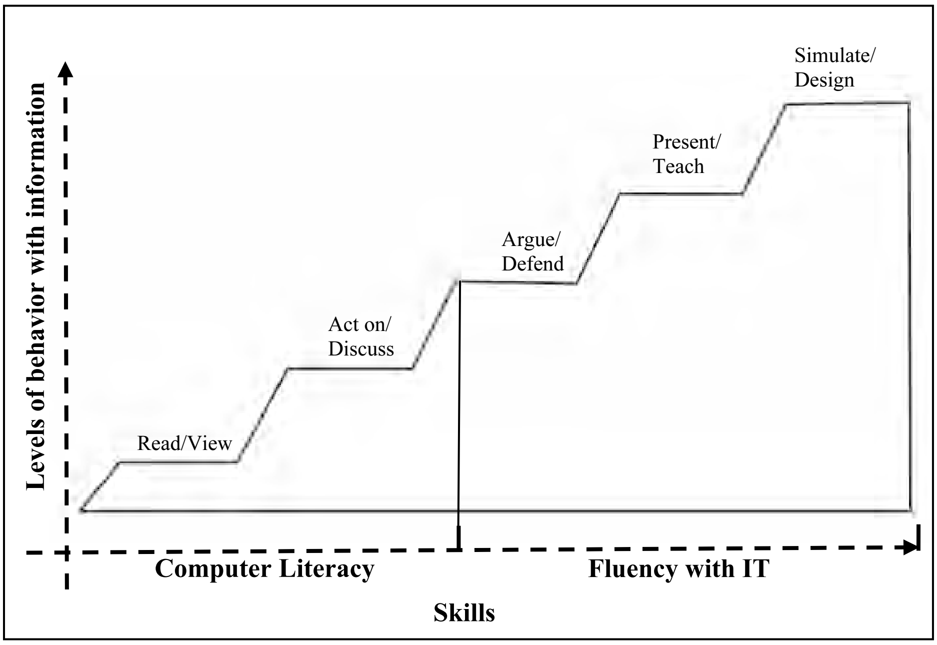


Figure 4. IT knowledge level-based behaviour with information

measure *behaviour with information* by levels as it is stated in Figure 4. The most transmissions with information happen at the bottom of 'engagement hierarchy of information" – in read/view manner. Documents, reports, live and video based presentations, e-books – all rely on this mode of information transfer. Reading and viewing require the basic computational literacy of the information receiver.

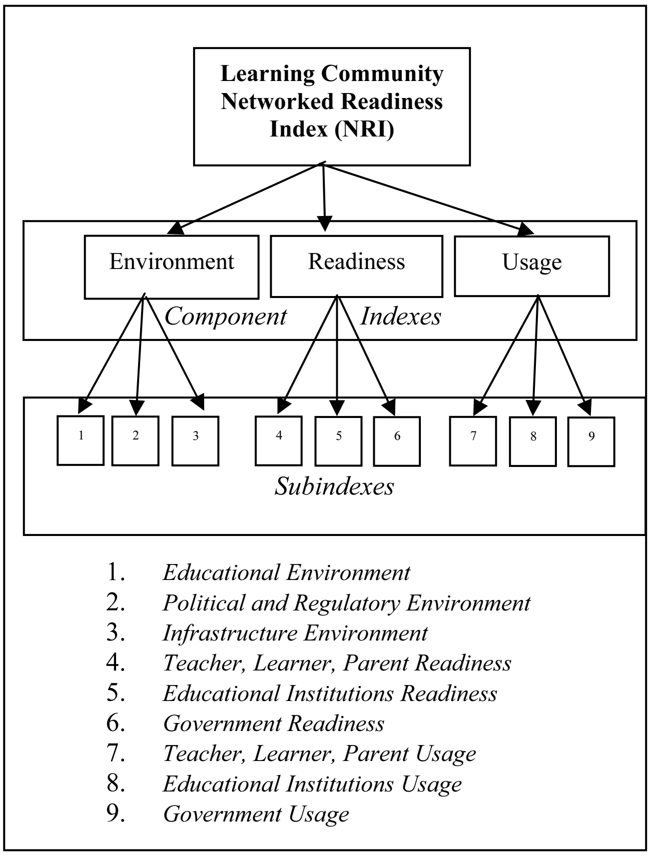


Figure 5. Online learning community culture measurement using Readiness Index (NRI)

The top of the engagement scale requires the fluency with IT from the participants while performing exercises, games and design activities. Fluency is characterized by different levels of sophistication. In addition, it has dynamic aspects and changes over time, requiring an engagement in information and lifelong learning. Fluency certainly should include contemporary skills such as using existing applications, but it should further be supported by digital media that allow users to tailor, customize, and evolve systems to their wants in personally meaningful tasks.

We explore the learning community of Lithuania as a huge educational organization which consists of: (a) authoring governmental institutions (government, municipalities), (b) education institutions (schools, universities, colleges, others) and (c) individuals (school boards, teachers, trainers, trainees, pupils, parents).

Following the study [11], we have developed the model (Figure 5), which allows in some extent to evaluate and measure the level of learning community culture to adopt ICT for educational needs.

NRI sub-indexes can be organized by a common set of components to derive a model to describe learning community of the country. Detailed measures for each of the sub-indexes are listed in our study report [16].

Another measure of LCC is absorptive capacity (Figure 2). In our view, *absorptive capacity* indicates at a larger extent knowledge evolution (dynamics) in the organization to search, access, produce knowledge and adapt innovations rather than static knowledge expressed using NRI. Absorptive capacity is a measure of how well the organization or community learns.

4. Educational portal needs

We have applied the LCC model for the Lithuanian educational system analysis in the context of the educational portal development. We have used a survey for data regarding the portal service needs collection.

One of our survey results – the distribution of learning community requests for different levels of online services (information publication, downloading, forms processing, transactions and tools) – is represented in Figure 6. The most desired specific online services are the following: receiving of tools for publicizing of training materials (94% in average), document management system applications (77%), the library of educational e-publications (79%), the software library (79%) and the subscription to educational news (64%), virtual communities (39%).

Both the representatives of government institutions and the teachers think that there is quite a lot of information concerning Lithuanian education on the Internet. However, there still are lacks for information in some areas, as well the available information is scattered in many separate web pages – for their work Lithuanian teachers use more than 17 distinct web sites related with Lithuanian education. Consequently it would be useful to develop a new overall educational portal (88% of teachers have such a request). Therefore, the situation for introducing of a new educational portal is favourable.

The educational portal will support LCC in at least three ways: (1) providing compression of time and space among the users, (2) offering the flexibility to exchange information, and (3) supporting information transfers and organizational networking independent of direct contacts between users.

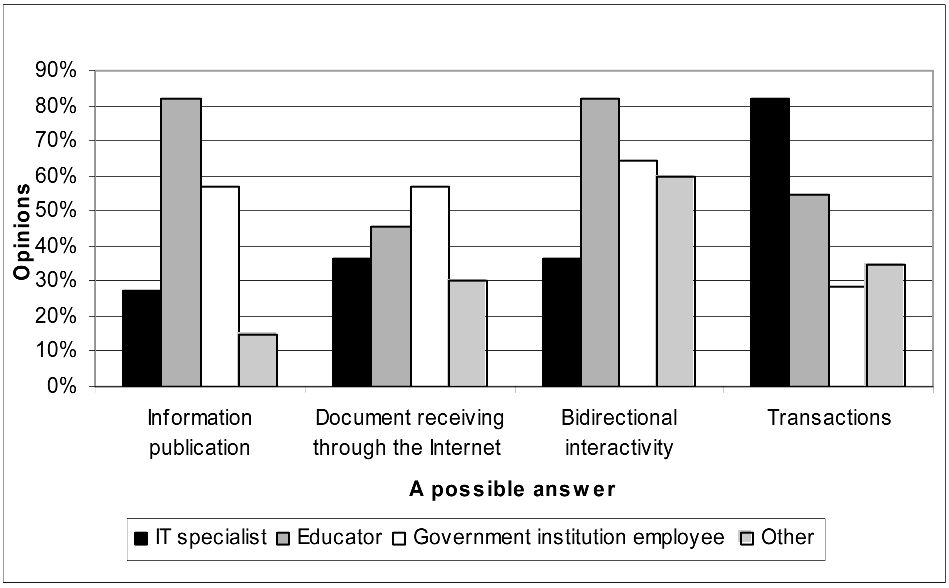


Figure 6. Distribution of requests for educational portal online services

Summary and Conclusions

As organizational culture has been found to be a key factor influencing the successful implementation of ICT, we have suggested and discussed a learning community culture model. The model allows: (1) to better understand and analyze the social-based processes within the learning community, (2) to measure, at some extent, cultural issues in the context of the IT application and learning, and (3) to better understand the technical issues comprising requirements (needs) statement, design and implementation for further creation and integration of the e-learning-based environments. The performed analysis (partially based on the proposed model) shows that cultural issues offer a perspective to understanding findings regarding the ICT use and organizational transformations and evolution.

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ONLINE LEARNERS' FRUSTRATION: IMPLICATIONS FOR LIFELONG LEARNING

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1. Online learners' frustration

Online learning is spreading across the globe as a convenient and efficient option for learning anytime, anywhere. Adults with family and professional responsibilities are increasingly regarding e-learning as a way to get the necessary education and training for their advancement in life. At the same time, young university graduates are taking up online learning on their way to the labour market, to take it up later too for further progress through their careers.

From a lifelong learning perspective, frustration and disappointment felt by online learners constitutes a major danger for learning through life. Other than what has been published about online learners' frustrations, from our own experience as instructors, trainers and educators we have realized that frustration in learners does exist, and that sources of frustration can be spotted, therefore they can be prevented or avoided.

Why and when does online learners' frustration occur? Is it mostly (or only) the learner's business? Which implications does online learners' frustration entail for lifelong learning?

This presentation shows which areas are prone to be a major source of frustration for the online learner, areas that fall within learners', instructors' and institutions' performance as such. It also recommends a set of actions for each of the agents of online learning – students, instructors and institutions – in order to prevent possible sources of frustration for online learners.

2. What can go wrong? Sources of frustration for online learners

Let us consider below a fundamental set of areas that may cause frustration, in connection with each of the three main agents in online education: student, instructor, institution.

2.1 The online student herself/himself

Being central to online learning, the online student is responsible for taking some of the actions that would prevent her/his own frustration.

Time management

Lack of time, or inadequate management of one's time, can be critical for many online learners, particularly for those with both professional and family commitments. This is so either because of inadequate personal organization, which prevents them from adequately harmonizing duties, or because of excess of work at the workplace. And it takes more than allocating time and a place for studying and for course commitments, it also means negotiating with one's family or one's supervisor which personal resources will be devoted when.

Expectations

Online students, particularly novice ones, can hold dangerous, yet common expectations about online learning requiring little effort, and that personal engagement is not essential. On the contrary, learning, through whatever medium, requires time and consistent effort: as well as studying, online students have to learn how to move about in the online environment, know where resources and materials are and how to get them; they will also have to read and write messages in various boards, read and study course materials, hand in activities, tests and the like and pass course assessment.

Enrolment

Sometimes students do not check properly requirements, contents, aims, or assessment of the course or programme they enrol, which might result in enormous burden later on in the course.

Wrong enrolment also comes from trying to chew more than one can bite, and this can be a strong element of frustration in the future. Tresman (2002:3) says that:

"... dropout occurs in relation to individual students' exceeding their personal thresholds, which they have failed to adequately establish through integration of their studies with their lifestyle."

Skills & strategies

Not knowing about appropriate skills and strategies is one of the most important drawbacks for an online student. Successful skills and strategies for face-to-face learning will not suffice for online learning. In addition, a basic-medium level of IT competence is essential. Online learners' computing competence could have to do with their level of frustration (Hara and Kling, 1999:13).

Participation & collaboration

Taking part in course activities and discussions should not be underestimated, not only because students can learn *from* classmates and *with* classmates, but also because of valuable help or guidelines that could be received from them (or provided to them). This kind of support could be critical in preventing or solving problems that could end up in a high level of frustration. Therefore students should engage themselves and make the effort to participate in the course with the rest of classmates.

Asking for help

Typically, not knowing where to ask for help, or how to ask for it, can become a critical source of frustration, particularly if the problem prevents a student from being able to learn or take part in class activities or assessment. It is the student's responsibility to get to know, from the onset, where available help is and how to contact for help, be it academic, administrative or technical.

2.2 The instructor/trainer/tutor/teacher

The instructor's role of guiding and facilitating is crucial. The instructor's actions may critically influence students' motivation and frustration.

Reply

Out of all the actions that an online instructor could carry out and that could have a result in frustrating learners, this is perhaps the most crucial one. A student who receives no guidelines, nor response, nor clarification from her/his instructor when needed is easily bound to consider there is no support available from the course facilitator. An online instructor has to be aware that prompt reply is required; even if it is something like "I'll found out and will tell you", it will show the student that her/his instructor has received her query and it will be answered in due course. Hara and Kling (1999:16) clearly observed this need for adequate response:

"The lack of prompt feedback from the instructor was certainly a major source of frustration ...".

Lack of rapport and flexibility

Online instructors should show themselves accessible and should actually be accessible to students, so that nearness results in students asking questions and telling about their problems.

Even though deadlines are to be met, excessive rigidity could become a serious obstacle to students, even leading them to drop the course.

Students' overload

In any learning environment, even more so in online learning, the danger of information overload is evident. According to Prendergast (2003:7):

"Skilled online tutors will be able to regulate the information flow so that course participants have sufficient activity to keep them motivated, whilst at the same time not making them weighed down with too much information".

Online student prior to online instructor

It is highly recommended that an online instructor experiences first what it takes to be an online student. Prendergast (2003:6) is very explicit about this:

"... it is essential to give future online tutors an extensive opportunity to experience collaborative learning online. ... This gives them a deep understanding of the essential issues involved and a feel for the subtle differences that an online tutor needs to be able to cope with, when facilitating online".

2.3 The institution/training firm

Institutions offering online programmes may be highly responsible for learners' frustration. Some specific fields, where institutions are accountable, are definitive for students to be either satisfied or frustrated with their learning experience.

Technological support

Lack of, or flaw in technological support is a constant in the literature: technological difficulties are a major cause of disappointment and frustration. These difficulties may become insurmountable at times for the online learner. Hara and Kling (1999), Sheinberg (2000), Murray (2001), and Prendergast (2003) all coincide in stating that efficient technological support is key for online learners.

Training instructors

It is in the interest of the institution itself – and of instructors and learners too – that online instructors are provided with specific training, as a face-to-face teacher does not automatically possess all the skills and strategies needed for online teaching.

It is interesting to note here what Prendergast (2003:4) says about it:

"Where people have tried to produce courses without the necessary CSCL [computer-supported collaborative learning] 'hands on' practice, they have, in my experience, failed. The tragedy of such failure is that often the medium is blamed rather than the way people have tried to implement it".

Learning environment

The institution is responsible for the learning environment, for materials, resources and services to work properly and not to become a source of learners' frustration. Sophistication is not a guarantee to success; on the contrary, it could contribute to frustration due to failure, lack of stable functioning or unnecessary difficulty of use. The institution is responsible for providing easy access to materials and resources within a clear, easy-to-use learning environment.

3. What could be done? Preventive actions

Having in mind the possible sources of frustration above, in the following tables a set of actions is recommended for each of the agents of online education and training. It should be born in mind that these actions recommended are not all the possible and desirable actions to be carried out by students, instructors and institutions in an online setting, but specific actions in order to prevent serious frustrations and problematic situations that could affect students.

Here ‘b’ stands for “before the course” and ‘d’ stands for “during the course”.

Table 1: Actions by the student

ONLINE STUDENT		
TIME MANAGEMENT		
	b	Check one’s own availability of time.
	b	Agree with family and work on required time to spend in the course.
	d	Adjust where and when necessary to increase amount of time or quality of time spent in the course.
EXPECTATIONS		
	b	Know about time requirements for course or subject and the amount and quality of work required.
	b	Responsible enrolment: available time, required effort, previous knowledge required.
	d	Take part in class activities and collaborate with classmates in order to progress and prevent problems.
	d	Be aware that everything takes longer at the beginning.
TRAINING AS AN ONLINE STUDENT		
	b	Do I know the basic skills and strategies to become a good online student?
	b	Where can I learn/know about them?
	d	Detect good skills and strategies from classmates and instructor.

As well as studying and taking part in classroom activities, in order to prevent their own frustration, online learners should adequately manage their time: organize one’s available time, harmonise time spent on the course with family and work, and make adjustments if needed.

It is essential for learners too to know about course previous requirements, about the amount and quality of work expected, and make a responsible enrolment according to available time. Students have to be patient too, as everything takes longer when learning online for the first time.

Aside from being aware of what is expected and what one could do, online learners have to know what it takes to learn online, what an online learner is supposed to do, and how or where that can be learned or incorporated to one’s performance as a student.

Table 2: Actions by the instructor

ONLINE INSTRUCTOR		
TRAINING		
	b	Training or acquiring experience as an online instructor.
	b	Having been an online student at least once.
	d	Help or guide students in acquiring skills and applying strategies as good online learners.
TEACHING		
	b	Design balanced workload and assessment.
	d	Give out clear and timely guidelines of what is expected from students.
	d	Publicly state time lapse for replies to students ... and stick to it.
	d	Show, and be accessible.
	d	Be flexible if possible, avoid unnecessary rigidity.

Online instructors' guidance and facilitating – the kind of which will prevent frustration – is greatly helped by having experienced beforehand what it takes to be an online learner. This previous experience provides a "feeling" for learners' needs that is not acquired by other means. Instructors with experience on both sides of the trench – as online facilitators and online learners – know the subtleties of online learning well enough to detect when a certain situation can become a problem or is indicative of leading to frustration. For instance, experienced instructors will make novice online learners be aware of the fact that at first it takes longer to study and communicate online than it will at a later stage.

In addition to subject matter contents, instructors should provide guidance and information on how students can become "better online learners" and help them acquire skills and apply strategies suitable to an online learning environment. Instructors' guidelines and their response have to get clearly and timely to students, within an atmosphere where the instructor is accessible, understanding and reasonably flexible.

Table 3: Actions by the institution

INSTITUTION / TRAINING FIRM		
ON THE STUDENT		
	b	Train students in acquiring skills and applying strategies as good online learners.
	d	Supply efficient technological support.
ON THE INSTRUCTOR		
	b	Train the online instructor.
	d	Supply efficient technological support.
	d	Supply teaching educational support.
ON THE LEARNING ENVIRONMENT		
	b	Provide an easy-to-use learning environment with appropriate communication and learning tools.
	b	Integrate appropriate course materials, resources and services within the learning environment.
	d	Maintain the learning environment in good operation.

Institutions can do a lot to prevent students' frustration.

First it should be to provide learners with an opportunity to reflect and know about what is required to be good students online. Efficient technological support to students and instructors should not be underestimated, as frustration caused by technology can be critical. Other preventive actions will include providing instructors with adequate training and also with the chance to experience being online learners. Last, but just as important, is for the institution to make sure that the learning environment, resources and services are adequate and are properly maintained.

4. Conclusions

Sources of frustration or disappointment for online learners can be of the greatest importance in life-long learning issues, affecting motivation and engagement in learning through life, and most likely resulting in delayed graduation or even students' dropout. This could naturally lead online learners to reject online learning as a valid way for personal and professional development, and possibly to a negative perception of life-long learning.

As to instructors, students' dropout and low student retention could have a negative effect not only on their personal and professional satisfaction and self-esteem, but also on a possible reduction in retribution.

As to institutions, students' frustration leading to delayed graduation or dropout can damage their funding and their social prestige.

Tables 3 shows that there is more to online learning than simply studying, guiding or organising and providing courses. There are a number of specific actions that can prevent to a great extent students' frustration and disappointment. In my opinion the most important are these:

- Students organising time spent on learning and harmonising it with family and work.
- Students knowing what successful online learning requires.
- Instructors having experienced what it takes to be an online student.
- Instructors helping students to acquire skills and apply strategies specific to successful online learning.
- Instructors being accessible and reasonably flexible to students, giving clear and timely guidelines and response.
- Institutions supplying efficient technical help.
- Institutions making sure that technology, materials, assessment and instructor training are appropriate.

As well as playing our respective roles, we can go beyond in order to prevent online learners' frustration, since satisfied and successful students will naturally regard online learning as a valid route for learning and improving in life. By preventing online students' frustration we will contribute to the future of lifelong learning.

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BECOMING A SUCCESFUL SELF-REGULATED E-LEARNING PARTICIPANT: SOME EMPIRICAL DATA

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Abstract

Are students prepared to be online learners in long-life programmes? This paper presents some empirical data about psychological and technical requirements to prevent failure and to promote success in *e-learning*.

Self-regulation and online learning

Autonomous and life-long learning will be progressively more important in the 21th century. In this sense, the new technologies of Information and Communication Technologies (ICTs) are mainly responsible for the deep educational changes that are taking place in our societies, and distance education systems have been highly involved in the developments of these new trends. However, a high number of desertions and academic failure is frequent in these types of educational systems, mainly due to the higher amount of difficulties and demands that autonomous learning presents to adult students. Therefore it is progressively widely accepted that the development of preventive strategies against drop-out and failure should advance into a deep comprehension of learning and performance. These processes are to take into account an extensive range of variables belonging to different areas and levels of analysis: personality, cognitive-affective strategies, behaviour, situation characteristics, etc. In this line, current theoretical approaches to learning view students as active seekers and processors of information (Schunk, 2001), and *self-regulation* as a key and integrative concept.

More precisely, one of the main requirements of adult learning, especially when talking about distance education, is that the individual has to be able to develop a correct control of his/her own learning pace and process to become a self-regulated learner. Students are self-regulated learners when they are metacognitively, motivationally, and behaviourally active participants in their own learning, proactively seeking out learning opportunities and profit from the activities it implies (Zimmerman, 1986, 1989). When coping with a learning task, self-regulating involves three main phases or sub-processes that constitute what is known as the *self-regulated learning cycle* (Pintrich, 2000; Zimmerman, 2000):

1. Forethought and Planning Phase: related to expectations of competence (self-efficacy, control, expectancies of success), motivation (intrinsic vs. extrinsic motives), task value, and planning;
2. Execution Phase: related to the different learning strategies the individual selects in order to solve the task at hand, and
3. Evaluation phase: it includes continuous self-monitoring and a final self-assessment that brings the opportunity to make adjustments during the whole process trying to avoid failure.

If to become a self-regulated learner is a main goal in more traditional educative systems, it seems that it should be even more essential in an *on-line* setting? Are people in longlife online programmes really prepared for these new active, as well as collaborative, methodologies which are destined to promote knowledge building in virtual spaces of learning and communication? Our proposal is that people should be trained to be self-regulated online participants, and that this training should take place in a specific training module at the beginning of each course. In this first training module, participants should understand the main characteristics and basic methodology of an online course and be trained to:

1. become a self-regulated learner;
2. develop effective interpersonal communication in a virtual community;
3. develop network collaborative work; and
4. finally, an efficient management of the different tools of the platform, or the virtual space in which the course will take place.

Training self-regulation in an online course

A first training module intending to train self-regulated learning should design specific activities for working with the three main phases of the self-regulation cycle. In our case, we covered this cycle assigning the following activities to each phase processes and requirements:

- *Forethought and Planning Phase*: in this phase, participants worked consecutively in three different activities:
  1. to complete an online questionnaire about their technical conditions to follow the course and their previous knowledge of the Internet and new technology uses, in general; and secondly a specific online questionnaire to make participants reflect about their required personal capacities and abilities to follow an online course;
  2. to make an adjusted individual planning for the module, taking into account available time, responsibilities, etc.;
  3. to analyse main objectives, goals and motives to be registered in the course. Learning motivation theories underlie that one of the keys for success is to be intrinsically motivated to do tasks and learning activities, whereas being extrinsically urged to do things is not advantageous for performance (Pintrich, 2000; Deci & Ryan, 2000). Thus, it is important to stimulate people to become intrinsically motivated along the course, if they are not at the beginning.
- *Execution Phase*: metacognitive and collaborative learning strategies were training through individual and collaborative networking that implied previous knowledge activation, information seeking, analysis, synthesis, discussion, etc.
- *Evaluation Phase*: finally, participants were asked to make an online self-evaluation of their performance and progress in terms of the objectives of the module, as well as an evaluation of the quality of the module itself.

This paper presents empirical data of the role of a training module in the subsequent performance of an online international course. The utility of training self-regulation abilities is highly stressed.

Method

Subjects

A total of 192 subjects (83 male and 109 female), of 17 Latin-America countries, filled up the questionnaires of the "*Expert on-line Course for Education Administers in Latin-America*". This is an international cooperation course promoted by the Spanish Ministry of Education and destined to Latin-Americans Education Ministries (Bardisa, Santamaría, Sánchez-Elvira y Oyón, 2004). The academic design, development and responsibility of the course were carried up by the UNED.

Procedure and instruments

Subjects had to give answers in a total of three different online questionnaires, specifically elaborated to give response to the *training model* objectives. Questionnaires were presented at different phases of the course:

1. The "Readiness for online learning" questionnaire: this questionnaire consisted of a total of 21 items in a 4 point Likert scale system of response, grading from *not at all* to *totally*. Participants had to fill in the form just at the beginning of the training module. It included:

- two items related to perceived capacity and comfortableness working with computers 1) “I feel capable of using new technologies without difficulties”; 2) “I feel comfortable using the computer”;
- three subscales related to self-regulating learning characteristics: Planning, organization and autonomy capacities (7 items); Intrinsic motivation and persistence (6 items) and openness and flexibility (6 items).

2. *Training Module performance – Self-assessment questionnaire*: this questionnaire consisted of a total of 12 items in a 4 point Likert scale system of response, grading from *not at all* to *totally*. Participants had to fill in the form at the end of the training module, and before receiving their marks. It included:
   - one item related to feeling capable to use the different tools of the platform after the training module;
   - two subscales related to a perception of a self-regulated execution during the Training Module: 1) Planning, organization and performance satisfaction (6 items); 2) Being interested during the Module, and also motivated to keep on going with the rest of the course.
3. *Evaluation of the quality of the Training Module*: this questionnaire consisted of a total of 25 items in a 4 point Likert scale system of response, grading from *not at all* to *totally*. Participants had to fill in the form by the end of the training module, and before receiving their marks. It included:
   - four subscales concerning Quality of *Contents* (10 items), *Activities* (6 items), *Tutorial Support* (5 items) and Group *functioning (*4 items);

Finally, all the marks and the average mark of the *Training Module* (module I) and the next two modules (modules II and III) were also considered as dependent variables.

Results

The statistical analysis intend to give response to three different questions:

Question one: Did participants feel prepared to follow an online course at the beginning of the Training Module?

Only 1,6% and 1,1% of the total sample did not feel capable of using new technologies without difficulties and did not feel comfortable using the computer, respectively. On the other hand, a 73,9% and 85,9% felt very much or totally capable and comfortable with the use of the ICTs, respectively (N=184). Therefore, it could be said that our participants felt quite comfortable working with computers (which in fact was a prerequisite to apply for the course registration).

Question two: Did participants feel capable to manage with the platform tools at the end of the Training Module?

Once the participants had finished the Training Module, any participant felt incapable of using the platform, a 11,9% felt they barely were capable, a 69,9% felt very much capable and a 18,2% of the sample felt totally capable (N=176). Thus, it could be said that participants felt quite prepared to work in the platform, although a 11,9 % still informed some difficulties.

Question three: Who was really prepared to follow an online course?

Different analyses were carried out in order to answer this general question. We analysed main statistical differences in all the questionnaires between individuals who failed in the Training Module and had to give up (only 8), and individuals who succeeded in this Module; also, we analysed differences between people who failed in any Module, and had to leave, and people who obtained a good average mark along the course. All these analyses yielded interesting results in terms of the self-regulation that participants developed during the Training Module. For reasons of space, in this paper we will only go into details with the analyses we carried out with *participants scoring very high or very low (one standard deviation above or below mean) in the subscale of self assessment about* *planning, organization abilities and performance satisfaction during the Training Module,* as this score was the best predictor for success (high group mean=21,91; low group mean=12,97; F(1,53)=1080,75; p<0.0001). Oneway ANOVAs were carried out for each dependent variable. Only significant results are shown in the tables.

In Table 1 we can see that, before starting the course, people that scored high in planning and organization during the Training Module *felt significantly more comfortable with NT and computers before starting the course.* Also, *they clearly felt more confident and competent with the platform management when they finished the Training Module*.

Table 1: Oneway ANOVAs for previous and final competence feelings about the use of the TICs

Items: Previous and final competence with the use of computers	High (N=33) Mean	Low (N=32) Mean	F (1,65)	P
Feeling capable of using NT without difficulties	3,25	2,81	7,07	0.01
Feeling comfortable using computers	3,47	3,13	4,27	0.04
Feeling competent with platform management	3,52	2,69	33.06	0.000

Analyses with previous self-regulating personality characteristics yielded significant differences between participants scoring high vs. participants scoring low in the factor of classification. Results showed that people that managed better at organizing themselves in the first module were also *self-regulated people in their lives in terms of controlling and planning activities.* Besides**,** after the Training Module, *this group was significantly more interested and motivated to continue* than the group that did not feel they had organized well in the first module (Table 2).

Table 2: Oneway ANOVAs for previous self-regulation personality characteristics and the self-assessment motivation subscale after the Training Module

Items: Self-regulating personality characteristics	High (N=32) Mean	Low (N=32) Mean	F (1,64)	P
Planning and organized personality	24,72	21,94	12,99	0.001
Items: Self-assessment after the Training Module	High (N=33) Mean	Low (N=32) Mean	F (1,64)	P
Interest and Intrinsic motivation for the course	15,27	13,47	39,41	0.0001

Table 3 shows an interesting result: people scoring high in the classification *group evaluated significantly better the quality of each of the Training Module* components (contents, activities, tutorial support or group functioning), being more satisfied with the course, in general.

Table 3: Oneway ANOVAs for the evaluation of the quality of the Training Module

Items: Evaluation of the quality of the raining Module	High (N=33) Mean	Low (N=31) Mean	F (1,63)	P
Contents	40,85	35,52	29,11	0.0001
Activities	18,48	14,94	50,73	0.0001
Tutorial Support	25,93	19,58	53,19	0.0001
Group Functioning	7,33	5,39	39,64	0.0001

Finally, Table 4 presents the marks for each group (scoring from 0 to 3). As it can be predicted, those participants that scheduled and organized themselves better in the Training Module, not only *obtained significantly better marks in this first introductory module,* but also in the following modules, whose contents were strictly within the course content domain (education administration). A *higher average* *mark was observed, too.* Also, we can say that, by the end of the Training Module, any participant scoring high in the factor of classification failed to continue with the course whereas 5 members of the low scoring group had to leave the course at this early point. 19 participants of the high self-regulated group got the highest marks in the first module meanwhile only 6 did in low self-regulated group. More so, by the end of the three modules, *only 1 participant scoring high in self-regulation planning and organization in the Training Module had failed to continue, whereas 14 failed in the group who informed lower planning and organization in the first module.* Finally, the 44 highest marks were obtained by participants in the high scoring group and only 11 in the lowest scoring one. Thus, it can be said that performance between these two groups presented clear and significant differences in the expected direction.

Table 4: Oneway ANOVAs for each module mark, and the average mark of the course

Items: Modules marks	High (N=33) Mean	Low (N=31) Mean	F (1,63)	P
Training Module (Module I)	2,45	1,45	21,74	0.0001
Module II	2,30	1,38	18,83	0.0001
Module III	2,12	1,40	9,10	0.004
Average mark	6,88	3,09	49.40	0.0001

Conclusions

Our research is included in the more general objective of disentangle the *“overcoming barriers to successful learning. Students need to be prepared for changing demands related to online learning with respect to technology, learning management, pedagogical practice and social roles”* (Vonderwell & Savery, 2004, p.1). In the present study, we tried to reveal some significant cues to prevent failure and promote learning achievements in the e-learning domain, despite current difficulties. As our data shows, one of the main goals to attain is to prepare participants to be on-line students.

Vonderwell & Savery (op.cit, p.2) point out that *“successful online learners need to be self-regulated, or in the process of learning how to become self-regulated learners”.* We totally agree with this reflection. In our study, the main predictor of performance success refers to the individuals capacity to plan and organize activities adjusting his/her available time to the task demands during a first training module. From our data, it can be concluded that some necessary keys to success are those that stimulate individuals to be intrinsically motivated and engaged with the course requirements, in spite of the effort and difficulties they might find. Some of these cues are the following:

- To advise future participants that feeling comfortable with the use of computers is a prerequisite to get involved in an e-learning programme.
- In terms of a course design, to prepare participants to be *on-line* students offering them a first training module in which students can learn to develop self-regulating abilities by performing self-regulation related activities, as well as to develop enough competence with the management of the platform tools.
- In terms of participants’ commitment with the course, to make them become aware that to take advantage of a training module is a strong contributor to future success, as being organized and able to control work pace is one of the main predictors of perseverance and motivation, and finally, of achievement.

Further research in this field is urgently required to help us with the design of better and more fruitful online programmes, paying attention to students’ requirements to be successful e-learning participants.

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CLASHES AND COMPROMISES BETWEEN TECNOLOGY AND PEDAGOGY IN ADULT EDUCATION THE REALITY AND THE VISION

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In this article we will assert that blended learning can overcome avoidant attitudes to integration of ICT in educational institutions and that blended learning can be a way to achieve the goal of a high rate of development of e-Learning in lifelong learning. The European ODL Liaison Committee has described the problem of resistance to integrating ICT in institutions in the article "Distance Learning and e-Learning in European Policy and Practice: the Vision and the Reality"[1]. The authors claim that the e-Learning market is developing at a much lower rate that foreseen because of resistance to integrating ICT in the organizations. They also claim that the lack of vision or ambition in policy planning of e-Learning and distance learning by institutes of higher education has resulted in misusing the term "blended learning" to hide the fact that they only use as little ICT as possible and tend to offer the same teaching as before.

We know of the resistance problem from our own institution, but we have also seen how integration of ICT in blended learning forms slowly changes the attitudes towards e-Learning. In the material we are about to publish as the result of a three-year Grundtvig 1 project[2] involving 7 partner countries in EU, we also recommend blended learning as a solution in adult education institutions. We have used the ideas and the experience we have gained from this project in the work to integrate ICT in our own institution and intend to discuss the results in this article. We will discuss it from an educational institution's point of view – in our case an institution involved in pedagogy, teacher education and in-service training of teachers.

Four theses

Resistance against E-learning concepts (including ODL and distance learning) has been considerable among teachers and students in adult education, especially in higher education. Our theses are that resistance can be connected to four main factors in the tradition of adult education:

1. The curriculum tradition.
2. The oral tradition.
3. Lack of confidence in technical solutions to educational matters.
4. Lack of experience with the media.

First field of resistance: The curriculum tradition

The curriculum teaching tradition is built on the idea of linearity. Progression in learning is based on study programmes, syllabuses, assignments and answers. The learner is expected to work through a certain pre-defined and pre-designed syllabus, to complete certain pre-designed assignments and to pass certain exams and tests before the institution can accredit the learning. A buzzword for such a traditional scheme could be the "just-in-case" curriculum – the content is something which is good to know, just in case one might need it. In one example of this type of learning, learners follow the curriculum as part of their professional tradition; they learn something that they, as representatives of their profession (businessman/lawyer/carpenter) are supposed to know, just in case they need it.

[1] Policy Paper of the European ODL Liaison Committee approved by the Member Networks. Released 17 November 2004

[2] I am L3, Grundtvig 1 project Oct. 2002 – Oct. 2005

Distance learning is better at supporting a more direct learning need – a just in time approach which is not very easily combined with an academic understanding of learning. The new possibility in E-learning are that you learn what you need, when you need it.

The problem is that the curriculum is not changed when an academic institution offers ordinary education as ODL. The objectives and the assessment are the same. This minimizes the teacher's possibilities or willingness to re-think his or her way of planning and carrying out the learning event.

Second field of resistance: The oral tradition

Part of our pedagogical tradition is that learning is encouraged by dialogue and discussion. Therefore teachers in training institutions are used to – and experts in – oral and direct communication. This communication has the character of "just in time" communication, it is sensitive and open to direct challenges and dialogues that include body-language. Some teachers doubt that digital communication can be as successful as oral, and they are inexperienced in finding digital ways to inform, provoke and challenge the student by other means. Another aspect is that distance learning requires a great deal of "just in case" communication within the e-learning materials and written communication for the teacher to be able to guide the student through different educational materials. These new challenges call for dramatic changes in both teachers' and learners' writing and comprehension competences. It also calls for new competences when you have to plan learning processes and events for participants you hardly ever see "face to face".

Third field of resistance: Lack of confidence in technical solutions to educational matters

Many quite experienced teachers are not confident that this technology will ever succeed. This is probably due to earlier experiences. Computers are not the first "techno-fix" in the world of education. Many of us still remember the millions of Euros put into language-labs in the early 1970s – ten years later, hardly any were left. Radio and Tele have also been promised to render teachers superfluous when they were introduced onto the market – they have now found their own humble corner in the classroom. Hubert L. Dreyfus has described this most succinctly[3].

Fourth field of resistance: Lack of experience with the medium

Developing e-learning and distance learning requires acknowledging the media, and this is rare in educational institutions. The employees in the administration, with work based on written routines, are much more familiar with the media than the teachers themselves. Therefore, teachers must be encouraged to use the media and to develop ways to integrate ICT pedagogically.

Our practical experiences

Practical experience would seem to indicate that blended learning can bridge the gap (heal the cleft?) between pedagogy and technology. Our experiences from "I am L3" show us that the gap is not a particularly Danish problem connected to the so called "Nordic Model" of teaching, but a common European problem that is possibly connected to a Pan-European mode of educational thinking, but that is more likely a world-wide phenomenon. Therefore we will focus on how blended learning has bridged a traditional and a new learning approach – including ICT – in our own institution.

Everybody on First Class and study lessons – the first bridge

Five years ago, we introduced the conference system First Class. Slowly, the teachers and the administration got used to it, and the principal after two years was able to declare the institution "paper free". This meant that all information was provided in conferences on First Class. The teachers started using the conferences in communication with their classes. Then "study-lectures" were introduced, where students worked on their own with the conferences becoming a main medium of

[3] Hubert L. Dreyfus, *On the Internet*, 2001

communication between teacher and student. Now some teachers spend 1-2 hours per day on electronic communication with their students. This means that when we introduced ODL, which mainly comprises distance learning, the hurdle was not too hard to pass.

Open Distance learning – the second bridge

In 2001, the Ministry of Education initiated a two-year “Merit Teacher Open University Course”. Merit Teacher training is an education programme where learners pay for a course to become a K-12 teacher. It is for people with a certain amount of experience. On average they are more than 30 years old and they are *given credits* for their former experience. They thereby have the advantage that they can complete their course of study after two years instead of the normal four years. The students are a mixed group of very experienced people. Some of them work alongside their study and most of them have a family. They are interesting in having a new profession, and the fact they are paying themselves makes them a highly motivated group of students.

This is why Odense College of Education, CVU FYN – along with two other colleges of education (CVU Jelling and Skaarup Statsseminarium) – decided from August 2004 to implement ODL as a special offer to this specific group of students. A management group was established and in spring 2004 courses were offered as in-service training for ODL-teachers. The ODL concept was designed as blended learning, based on a collaborative learning approach: 20 % of the lessons as face to face and 80% as distance learning.

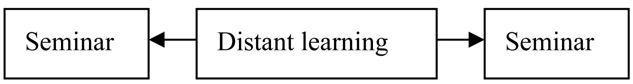
We used a didactic model of relations[4] to analyze the needs of our ODL teachers. The results are briefly as follows:

> The teachers were experienced teachers in traditional teaching and among the more experienced teachers who were integrating ICT in their traditional teaching. To be ODL teachers they lacked knowledge of the advanced use of our conference system and insight into the theories of blended learning.
>
> The teachers have to follow the national curriculum, as in ordinary teaching. The big challenge for them is to plan courses for the students in a way they have never tried themselves. They have no experience or reflection to underpin this work. The content and materials are also quite new when compared with traditional teaching. They can still use books and hand-outs, but now they have to integrate materials from the Internet as well, or get permission from authors to digitalize their materials. This mean they also need to know something about legal aspects.
>
> The work process they are facing as ODL teachers are new, because they rarely meet the students and have to promote discussions and work potential on the net. To support that, the management group wanted the in-service training to be structured in the same way as the ODL course. This was also a good idea, as the teachers came from three institutions that were far from each other.

The final assessment of in-service training is planned to take place after the ODL-teachers have completed their first year as ODL teachers. This will be in July 2005.

The course

The in-service training used this model:



This meant that the course involved blended learning, as future ODL-teaching was supposed to do.

The first seminar was primarily used for a theoretical and technical introduction as well as for socializing among the teachers. Teachers are normally lone riders – now they had to teamwork. The

[4] Getting Started in ODL, net yet published manual from I am L3, Grundtvig 1 project

teacher's task as distance learners was to create a module for distance learning which they could use as an ODL-teacher. They had to respond to each other and afterwards they would get response from the tutor. The response part of the course was very important because they had to be familiar with the difference between the oral and the written medium. They also had to learn some techniques as to how to create a positive and positive atmosphere during response.

The ODL teachers didn't carry out the response phase during the distance learning period as planned. They only sent their assignment for the courses just before the deadline. Therefore, we decided to change the content of the second seminar. At that seminar we showed them principles of response, with examples from two of the tutors and afterwards we asked them to make up for the lack of response in groups at the seminars where four tutors assisted them. This was a great success.

Evaluation

Our experience from working with Merit Teacher Training and the ODL-teacher in-service course is that learners need very precise instructions and assignments and those they try to avoid responding to each other. Instead, they are very active when their job is to share information and to cooperate on common tasks. It is easy to make discussions in a group on the basis of assignments, but it is difficult to create the same discussions in the main conferences, which we think is due to a lack of mutual confidence.

We see this development of Merit Teacher Training and in-service training as a positive initiative, and it is now a catalyst for both the development of other courses of study within the organizations to be provided as ODL-courses and as a more convenient use of ICT as an integrated part of all studies.

Our vision for the future

We believe that blended learning will be an increasing part of the studies we will provide over the next years, and we have realized that many problems need to be solved and many skills acquired before face-to-face interaction can be totally done away with – if ever.

The curriculum problem

First, we have the curriculum problem. The new ways of working with the digital medium create problems when it comes to following a curriculum developed in an oral tradition. Our conclusion in the Grundtvig project is that ODL requires a new type of curriculum based on problem-solving teaching approaches or that ODL must be based on "just in time" training modules. Both methods require the objectives to be clear to the learner. But this is not always the case in the field of education. Academic training is traditionally based on a slow introduction to specific abstract ideas and working methods. So the objectives of the course of study are not clear for the student from the start. Neither are the working methods. So far, we do not know how to deal with these problems on the Internet. In our best practice studies we have found that some content is easier to work with in a digitalized form than others.

This model[5] introduces the problem:

Knowledge	1. Order (analogy)	2. Order (digital)
Knowledge that	I know, that sugar tastes sweet I know, that 2 apples are more than 1	I know, that Cuba produces sugar I know, that 2+2 = 4 I know, that **to be** is a verb
Knowledge how	I know how to ride a bicycle I know how to speak English I know how to make a pizza	I know how to use the computer I know how to read and write I know how to follow a recipe
Knowledge by acquaintance	I know him I know Venice I know carpeting	I know Microsoft's Windows programmes

[5] Getting Started in ODL, net yet published manual from I am L3, Grundtvig 1 project

A presentation of digital knowledge on the Internet is not a problem, but an introduction to analogue knowledge and working processes is something else. The theoretical answer to this problem has so far been collaborative work processes based on peer work. But, as we have seen, this is difficult when the participants have no experience they can use to reflect on the work process. Research needs to be done in this field.

The oral tradition

To switch from an oral tradition to a written one is also not that easy, although it would seem to be an easier task. The key word here is training – and training is needed both among students and teachers. The required literacy level is much higher in ODL than in traditional education; you need a good understanding of what you are reading, and good writing competences to respond in an appropriate way.

We have given a lot of discussion to this matter in our Grundtvig project. One point is that the Internet also offers you a lot of images and sound facilities and new ways of communication that reduce the amount of material needed to be read. This is in some cases correct, and it leads us to the conclusion that learning on the Internet in some cases is time-saving, and in other cases time-consuming.

Lack of confidence in technical solutions to educational matters

The main problem about developing ODL has been that those who knew the technology didn't know about learning theory and didactics. Therefore, they were not able to develop sufficient E-learning concepts. And those who knew about the pedagogical and didactic issues did not know about the technology. By experiences in both fields and interaction between the two groups, this problem will slowly be overcome. Blended learning is a way to introduce teachers to the new medium and their new potential. Through experiments is it possible to investigate to what extent these medium can replace or support more traditional ways of education. In the Grundvig project, we have so far found fields in Lifelong Learning where ODL works perfectly and fields where it is very difficult to achieve the learning objectives through the medium.

Lack of experience with the medium

Production of teaching material for ODL is a new challenge for E-book authors, publishers and teachers alike. We have legal aspects concerning intellectual properties, we have technical aspects, and we have data collections problems – especially when it comes to photos, videos and sound. Digital media are expensive to produce, and reuse is crucial if we expect some kind of return on investment. Standardization is obviously the only answer, but this does not correspond to the academic tradition of freedom and emancipation. In our Grundtvig project we have introduced new ways of organizing ODL in modules and work packages, which makes it possible to overcome these problems. We have to think of learning objects as sources which can be used in different ways, without having tied up the teacher in specific concepts.

Via the experience our institution has now gained, it has learned that teachers and students without ITC-skills should be encouraged to take courses and use ICT in their everyday lives. It is highly valuable to show them how other teachers have integrated ICT and to give them assignments where they themselves have to integrate ICT. For our institution, introducing the conference system has been a positive experience, with teachers from the in-service training course now having started to implement e-Learning in their ordinary teaching.

Conclusion

No large-scale investigation has yet been implemented to explore the potential of learning via ICT. It is obvious from what has been experienced to date that some kind of content is more suitable for ODL that other kinds and that some ways of working with the media are more suitable than others.

ICT opens up new possibilities in didactic thinking. While classroom teaching is a kind of mass-education designed for the average student, ITC opens up for real differentiation in content and working methods. Educational events can be organized in ways that appeal to individual needs and learning styles. But to use these facilities requires new competences in both teachers and students.

Decision-makers in educational institutions need to know more about what the possibilities are when offering ODL, what kind of investment is needed, what kind of training is needed, and what kind of changes ODL requires of the administration and of the teacher.

Teachers need to know more about the medium itself and need more experience to be able to reflect on the possibilities in a didactical context. They need experience in how to challenge the student via the Internet, how to respond to individuals and groups and how to facilitate Internet discussions. They need to know more about differentiation and about how to appeal to different learning styles.

The students themselves need to know more about studying ODL. They need help in learning how to work with the medium, how to communicate, how to cooperate with their peers. They need help in learning how to analyze, what their objectives are and what expectations apply concerning their participation and results.

Blended learning is a good way to get started. Changes in ways to manage, organize and design education will follow. How far and how things will develop is difficult to foretell.

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ONLINE FOLLOW-UP COACHING OF TEACHERS' FURTHER TRAINING – ANALYSIS OF THE TARGET GROUP'S NEEDS

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1. Preface

Lifelong learning is inextricably connected with the teacher's profession. Following the idea of educational scenarios (Baumgartner, 2004) and focussing on the target group's needs, the aftercare operations of a teacher further training were analysed to learn about the special needs of the special target group of teachers. Aim is gaining the ability to create online offers adapted as optimal as possible. We assume this will hold psychological inhibition thresholds low and increase the offer's and the personal learning success.

2. Introduction

Germany's education system is stuck in a crisis (Rüschoff & Wolff, 1999). Since PISA (the Programme for International Student Assessment) created a stir due to bad results, many suggestions and plans have been made to improve and to ensure the quality of our schools. For example, in Oldenburg for teacher further training, a team of four professors developed five modules for the development of quality in education, the so-called "The Oldenburg Concept" (Kiper *et al.,* 2003). This is based on the assumption that the quality of education is very closely connected to the professional approach of teachers' action (http://www.member.uni-oldenburg.de/hanna.kiper/5409.html). This claim leads to a quasi permanent demand of further training of teachers as it is e.g. in one of the German states, Bavaria, obligatory since 2002 (http://www.forum-schule.de/archiv/11/fs11/magbre.html) and usus in many others.

Lifelong learning is essential for teachers not only against this background: specialised knowledge becomes obsolete very fast today (http://inhalt.monster.de/4095_de-DE_pl.asp, http://www.dtp-net.de/ehemalige/bericht2.html). Simply said: teachers provide knowledge and knowledge increases each day, thus teachers have to acquire at least some of the 'new' knowledge to be able to provide it and, moreover, they should be able to convey how to acquire knowledge.

So: within this society – a dynamic environment with a fast-paced information and knowledge development – everybody needs the skills for adaption and acquiration of viable action patterns, and teachers need them for special reasons.

E-learning is not unusual in the further training of teachers. For example, "the Economic Education Online (EEO) is developing and testing an internet-based teacher training programme for teachers of economic education" (cf. Feeken *et al.,* 2004, http://www.ecedon.de;). In addition, an internet-based database actively supports teachers of that field with numerous teaching aids (http://www.wigy.de). There are several similar rich sources to be found in the www (e.g. http://www.lehrer-online.de).

Taking up the idea of the educational scenarios (Baumgartner & Bergner, 2004), we state 'teachers' as a special target group with singular features which differ from those of other target groups. Not claiming completeness, differences can be found regarding: intention of qualification, motivation, expert previous knowledge, available learning methods, access to media, ICT qualification, attitude towards internet usage, institutional basic conditions, financiation.

To meet the demands of the target group its' material, social and psychological needs and inhibition thresholds have to be known. This may help to increase the potential learning success, and to have this knowledge in advance preserves online tutors for teachers from having to reinvent the wheel themselves. The intent to generate an appropriate online scenario for teachers and to be able to create one of the best possible learning situations for them leads to the consideration of analysing at least some of the above listed features.

Our analysed online offer is the follow-up of the above mentioned face-to-face further training of teachers (based on “The Oldenburg Concept”). As method we used a self-developed questionnaire.

3. General facts

3.1 The further training of teachers (“Oldenburg Concept”)

3.1.1 Background

Starting in summer 2002, the team of authors of “The Oldenburg concept” is qualifying teachers of the districts Weser-Ems and Lüneburg according to the “Quality Development in Networks”, a lower saxony government project.
(http://www.mk.niedersachsen.de/master/C26700_N12363_L20_D0_I579.html)
In compensation for the invested training hours, all teachers got a certain amount of free lessons. In order to participate, the teachers had to apply and get chosen.

3.1.2 Participants

Our sample: the second course, 2003/2004, with 16 teachers of all school forms, their ages ranging from 36 to 56. Working at the same schools, some of them already knew each other.

3.1.3 Content

The further training consists of five modules. In the following, we shortly describe the topics.

- Module 1 discusses how to understand the notion of quality in education, the importance of common standards and a curriculum which orientates on the pupils’ learning progress.
- Module 2 shows how to develop and use methods for the specific fields.
- Module 3 reasons about learning and teaching strategies in heterogeneous groups.
- Module 4 picks out fault analysis, diagnostics and the planning of special needs.
- Module 5 links quality development in teaching to the whole school’s organisation development.

3.1.4 Aim

Main aim of the further training is the enhancement of instruction’s quality. This is to be reached by training teachers who will apply their newly gained skills in their own classes and, at the same time, are qualified to train other teachers.

3.2 The follow-up coaching

3.2.1 The coaching idea

After the further training, about half a year of follow-up coaching is planned to support the teachers to integrate the newly acquired knowledge in their everyday lives at school. This process is being ensured by appointed coaches.

3.2.2 The web idea

For participants and coaches are spread over the state of Lower Saxony, an e-learning solution allows them to get in touch quickly. A platform was installed to provide

- several forums for discussion, synchronous communication, personal talk;
- the possibility to up- and download teaching material and theoretical articles.

Figure 1. The Starting page

3.2.3 The realisation

The ICT infrastructure used is a web-based learning platform based on Lotus Notes, IBM. The platform was introduced by a 14-pages-manual which was sent to the participants by letter-mail. In the beginning, in February 2004, a virtual paper chase, beginning on the starting page, intended to help the participants to find their way through the platform. On the starting page, the first work assignment was posted. Additionally, one of the Oldenburg concept's authors, Dr. Wolfgang Mischke, offered a synchronous LiveForum (Brunner & Ilse, 2004) once a week. Technical and organisational support was provided by one of the authors of this article, cand. psych. Stefanie Brunner.

4. Methodology

4.1 Questionnaire

Before the platform's opening, a paper questionnaire was sent to the participants.

4.1.1 Structure

The questionnaire consisted of four parts.

Part 1) General facts about usage of PC and internet (multiple-choice questions).
Part 2) General attitude towards the online offer.
Part 3) Ranking the reasons for welcoming the offer.
Part 4) Open questions about hopes and fears.

4.1.2. Scaling

To avoid one-sided tendencies in answering, top and bottom answers were alternately placed on the left or on the right scale's end.

4.1.3 Social acceptance

To filter tendencies in answering according to social accepted ways, several questions with different scaling were included.

4.2 About the analysing method

The results were analysed mainly qualitatively, not quantitatively, for the number of participants was too small in order to generate significant statistical results. Nevertheless, it is possible to draw some valuable conclusions from these results enabling further research.

5. Results

Ten out of 16 participants sent their questionnaires back.

5.1 Results of the multiple-choice part

All use their PCs at home. 30% use the touch system. At school, 70% have cost free internet access. At home, 90% have internet costs. 90% use internet privately, 80% for their profession. 20% have ever participated actively in an online forum. All use the PC frequently to create texts, 80% use internet often for e-mailing. 60% welcome the offer with more than 50% on a scale, 20% see themselves exactly at 50%, and also 20% rank themselves below 50%. 30% explicitly say that they are not participating only because the online offer is part of the further training, 40% say this is almost mainly the reason. 30% say this is at least partly one reason of their participation.

5.2 'Top 3'-question

One question was to generate a ranking which out of eight possible reasons for participating the online phase were the three most important.

The "gold medal" was given for the item "exchange and discussion with the colleagues". The second place has "chance of content deepening" and the third "getting teaching and learning material free for download".

The other items in the order of their ranking:

- "quick contact to coaches"
- "participation is obligatory"
- "quick contact to the modules' authors"
- "internet usage"
- "to upload teaching and learning material for others"

5.3 Results of the open questions ("Hopes" and "Fears")

Hopes are well represented in the answers of the multiple choice part. Therefore we concentrate on the fears.

The most frequent answers given are:

- time pressure, working with the platform might be too demanding;
- fear of being controlled, fear that participation (frequency of contribution) might be used for assessment;
- pressure to perform;
- pressure to write sophisticatedly and ready for press sentences;
- problems to handle the platform;
- insecurity regarding data protection.

5.4 Further comments

One participant states that it is inconvenient for her to access internet at school.

6. Discussion

The discussion refers to the results described under 5.

Ad 1) The results of the multiple choice part show that every participating teacher uses the PC often, either privately or for the job, using word processing as well as internet for e-mailing. Internet access

is cost free in most cases at school but not at home; but as one participant added (cf 4.), internet access at her school is inconvenient so she prefers to go online at home (which is not for free). We assume that other teachers have similar problems
(cf. http://www.elearningeuropa.info/index.php?page=doc&doc_id=1127&doclng=3&menuzone=1). Thus, the basic requirement to keep barriers low must be an internet that is easy to access which means: good ICT infrastructure.

More than 60% of the sample state a positive attitude towards the online offer, but as another question shows, 70% are at least partly or even mainly extrinsic motivated for participation is part of the further training and therefore necessary for receiving the certificate in the end. This leads to two questions: First, how can we motivate those who seem not to be motivated intrinsic? Second, to answer the first question, we need to know the potential reasons for the teachers‘ low motivation. This leads us to the next questions of the questionnaire.

Ad 2) The three top reasons of interest are “exchange and discussion with the colleagues”, “chance of content deepening” and “get teaching and learning material free for download”. Thus, we put emphasis on these topics. This means: first, offering various possibilities for discussion with colleagues and also with the trainers resp. coaches. Second, offering incentives for uploading teaching and learning materials (for if no one is uploading there is nothing to download for others). Third, providing the information of the existing internet databases for teaching and learning material (e.g. http://www.wigy.de, http://www.lehrer-online.de).

Ad 3) These results are very interesting for they tell us about the most important inhibition thresholds. Several teachers admit being afraid of time pressure and fear that working with the platform could be too demanding which goes hand in hand with the point “problems to handle the platform”. This certainly results of missing previous experiences with e-learning. We have to consider the age pattern, for we can assume that the older generation is less familiar with the medium internet. Not only have they to do the work for the online course but they must also acquire the knowledge how to handle the medium. The enforcement of training teachers how to use internet should be considered.

The other answers can be subsumed under the title “missing information”. This means, it seems that some information one could expect to be taken for granted is *not* being taken for granted, for example data protection, which obviously is existing as the login procedure demonstrates. We come to the conclusion that at first, it is most important to explain everything that might cause worry. Second, it has to be considered that information given in the formal way might get overlooked or forgotten or sometimes is not read at all. Thus, a face-to-face meeting in the beginning is invaluable. Everything can be pointed out clearly and open questions can be answered immediately.

7. Conclusion

In spring 2004, follow-up coaching of a further training for teachers were implemented as an online offer. To optimise the offer, a questionnaire was to be filled in by the participants in advance. The results were analysed mainly qualitatively, not quantitatively, because of the small sample. Aim was to generate data on which basis we can continue research.

Our fundamental assumption is that certain features are typical for the target group of teachers. If this is so, special variables can be taken care of in advance of an online phase.

Basically, when an online offer is implemented, the support has to distinguish the following tasks:

- (1) Hold inhibition thresholds low;
- (2) Motivate to participate actively.

How can this be accomplished in a group of teachers? Regarding the results of our analysis, we suggest the following (in brackets you find the number of the above mentioned division):

- Optimal internet access, convenient and exempt from charges (1);

- A face-to-face meeting at the beginning of the online phase is very useful for several reasons:
  - Participants get to know the support person(s). This lowers the barriers to contact the support later when technical or other problems appear even if the problems seem to be small or even ridiculous (1)
  - Participants can test the platform while sitting altogether in one room. This heightens the pleasure and dissolves reservations and inhibitions. They can experience that it does not count to write ready to press but to communicate with each other (1, 2)
  - Every question regarding organisation, technique or structure can be answered at once (1)
  - It helps to create a pleasant group atmosphere, motivation and curiosity about what will come (2);
- A contingent situation creates fears, so reduction of contingency (in terms of Luhmanns "Theory of Systems") helps reducing fears. This means:
  - A clear structuring of the offer with well-dosed guidance is absolutely necessary just as well as to specify which expectations will have to be met, i.e. when which task will have to be done and how much working time will be necessary per week (1)
  - In the beginning, categories of assessment have to be explained. For example, it should be made clear if the number of posted contributions will be taken as measure for the quality of participation (1,2)
  - Fears regarding data security can be dissolved by open information policy and measures increasing confidence in the technique's reliability. For example, while the face-to-face meeting takes place, it is possible to demonstrate clearly enough that only people with login and password have access to the database and that all passwords are absolutely confidential (1).

As we demonstrated above, the mixture of generations demands mixed approaches for the target group of teachers. The group of teachers in their midforties or midfifties still being in business for about 15-20 years should not be forgotten. We have to create an adequate structured offer for their needs.

Including ten teachers, our sample is too small to generate statistically significant results that could be generalised. Anyhow, the gained qualitative data may firstly help to put emphasis on certain points while planning the next online offer for teachers, secondly generate hypotheses for further research.

After all, assuming that special features are typical for the target group of teachers means to take certain measures in advance. Nevertheless, it is important to ask each group individually for their needs, for each group is different from the other and may have its own cares and worries. Best case scenario means best results.

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ELECTRONIC EXAMINATIONS: STUDENT READINESS

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Abstract

Despite the fact that electronic learning has existed for a relatively long time, it is still in its infancy. The same goes for electronic examination. This paper presents the findings of our electronic examination research. It discusses readiness of students for taking such exams. The study confirms that the majority of participants are prepared to take electronic exams. They are enthusiastic about the immediate feedback and time and place flexibility. However they have some reservations about the technological issues.

1. Introduction

Information technology has a great potential to enhance education if appropriately applied. According to the Bologna Declaration one third of the education process should be performed at distance and supported with information technology. The Faculty of Organisational Sciences at the University of Maribor is following these directives. Parallel with introduction of the so-called electronic learning (e-learning) the possibilities of introducing electronic examination (e-examination) have also been considered. As to that we are trying to find out whether electronic examination is reasonable, whether the students are prepared for this kind of examination, whether they expect electronic exams with anxiety and to what extent, how this kind of examination should be introduced and other related details.

For better comprehension the terms e-learning and e-examination are explained in the beginning of the article. Afterwards the methods of research are described, including brainstorming, categorizing, modelling, and surveys. At the end the results of the survey of students' readiness for e-examination are presented.

2. E-learning and e-examination

The use of the term e-learning is growing rapidly and is frequently used interchangeably with terms such as: online education, virtual learning, distributed learning, networked learning, Web-based learning, and also open and distance learning. Despite their unique attributes, each of these terms fundamentally refers to educational processes that utilise information and communications technology to mediate asynchronous as well as synchronous learning and teaching activities (Jereb and Šmitek, 1999; Naidu, 2002). A multitude of definitions of e-learning already exists in literature. For many authors the adoption of electronic media in a learning scenario is already sufficient to constitute e-learning (see e-Learning Consultant 2003). This definition is clearly too broad. We suggest the use of definition stated by Tavangarian and others (2004) to emphasise the new and different aspects of e-learning as compared with traditional learning: "We will call e-learning all forms of electronic supported learning and teaching, which are procedural in character and aim to effect the construction of knowledge with reference to individual experience, practice and knowledge of the learner. Information and communication systems, whether networked or not, serve as specific media to implement the learning process."

There is no doubt that e-learning is growing. Draves (2002) stated that about half of all learning will occur online in the 21st century. An increasing amount of interest is also being paid to an area closely connected to e-learning – the e-examination, also known as computer-assisted assessment (CAA).

Electronic examination can take place locally – in classroom or away from the examining institution. A remote electronic examination is conducted with candidates at a location separated from the examining institution using the Internet for communications. Candidates respond to questions by typing or dragging their answers into text boxes for uploading to the institution. In an asynchronous examination candidates download the exam paper from the web site, prepare their answers off-line, and reconnect to the examination web site at the end of the set time period. In a synchronous examination candidates remain connected to a server for the duration of the examination period (Thomas *et al.*, 2002). The last is also characteristic of the e-examination in the classroom at the examining institution.

With rising numbers of candidates to be examined, the prospect of grading the exams automatically promises faster, cheaper and more consistent grading (Shermis *et al.*, 2001). Even if automatic marking is not used, capturing candidates' answers electronically has potential benefits in legibility and comprehension for graders. There are advantages, too, in security, with papers being held electronically and only being released to candidates shortly before the designated start time of the examination. In a distributed system, as commonly found in distance education, electronic examination has the potential for speeding up the whole examination process from the transfer of student answers to markers, standardisation of answers, to the consensus on the final grades.

A common criticism of remote examinations is the difficulty of ensuring that cheating is minimised (Whittington, 1999). Therefore electronic examinations taken under supervised conditions have been implemented. But we are also interested in pursuing the use of examinations in less formal settings, particularly at home. Such environments are similar to those in which distance education students normally study and avoid the need to attend unfamiliar locations that increase student anxiety.

For better implementation of electronic examinations regardless of location and synchronisation we investigated the readiness of students to take this kind of exams. The results are shown later in the article.

3. Methodology

Readiness of students to take exams electronically was researched with the help of group decision support systems (GDSS) which is described in (Kljajić *et al.,* 2000). According to the study programmes renovation directives set by the Bologna Declaration we defined four possible alternatives for taking exams. In this process three groups of students in the Faculty of Organisational Sciences who also collaborated later in the survey were involved. Alternatives and their descriptions are shown in Table 1.

Table 1: Alternatives considered for decision-making

A1: No e-examinations. Examinations should be oral or written on paper.
A2: Use e-examinations for instant tests and classic tests for final exams.
A3: Combining electronic and classic examinations.
A4: E-examinations only. In classroom or remote, asynchronous or synchronous.

On the base of these alternatives the questions for the survey were gathered and categorized. The process was supported by GDSS GroupSystems (GroupSystems, 2005). GroupSystems solutions help teams accelerate the knowledge process and generate results faster. The software gathers implicit knowledge and enables productivity without information overload.

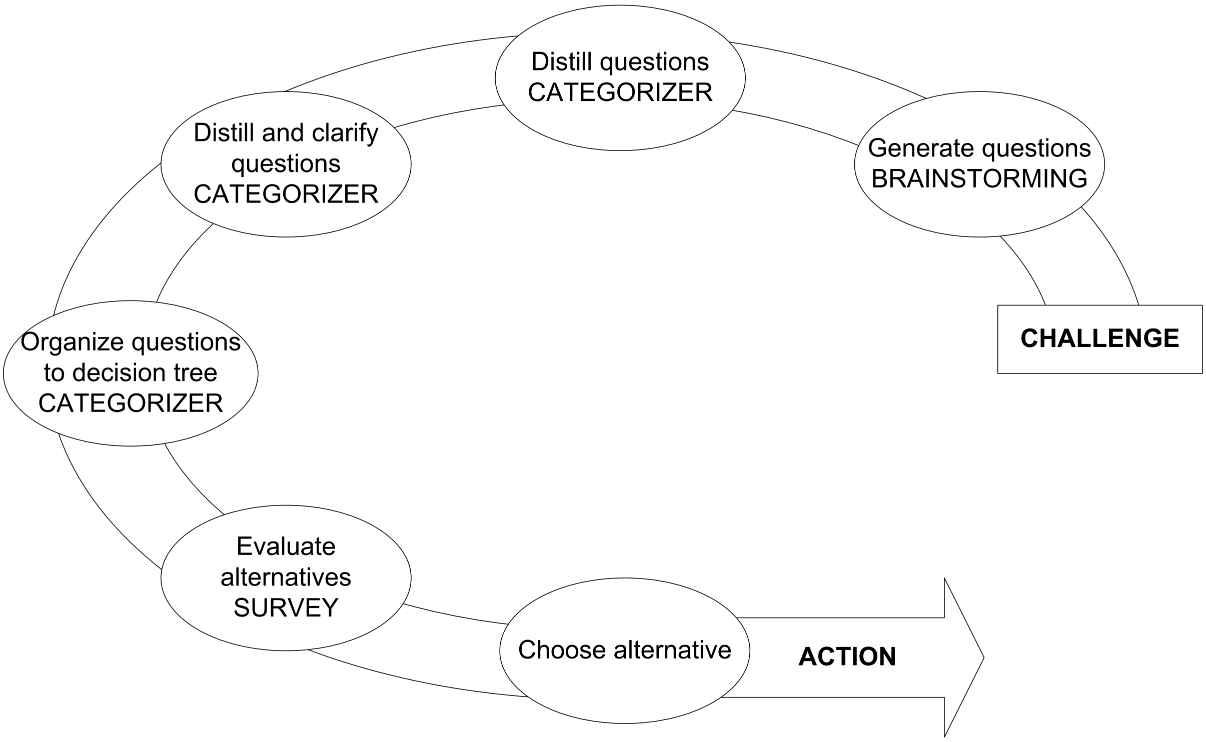

Figure 1. The methodology of researching students' readiness for e-examination

Brainstorming was used to collect the questions, which would help us select the right alternative. Brainstorming stimulates creativity by passing ideas randomly and anonymously between participants, allowing them to add their own contributions as inspiration takes them. We raised the electronic brainstorming activity with next question: "Why would you like/dislike to have e-examinations in your learning process?" We received 83 answers and sorted them with the Categorizer function. Categorizer helps a group sort ideas and descriptive comments. Ideas can then be easily and quickly sorted into categories. As a result of the categorizing activity we got 12 questions. These questions were then transformed into statements for the survey. The answers to these statements should help us to choose the right alternative for taking exams (Table 2).

Table 2: Statements for e-examinations survey

S1:	I would replace classic written or oral exams with e-exams.
S2:	Immediate feedback is one of the main advantages of e-examination.
S3:	E-examination is far more interesting than classic examination, it attracts and motivates me.
S4:	E-examinations should be time limited.
S5:	E-examinations ensure objective evaluation of results.
S6:	E-examinations require a high level of computer knowledge.
S7:	E-examination is straining, it would make me too tired.
S8:	One of the advantages of e-examinations is less possibility of cheating.
S9:	Knowledge should be tested instantly with help of e-examinations.
S10:	E-examinations could take place remote from the school.
S11:	E-examinations could be carried out anytime, according to individuals.
S12:	If I could choose between classic and e-examination I would choose e-examination.

Further these statements were categorized into four groups also with help of the Categorizer. On the basis of these four groups or categories the decision-making tree for the multiple criteria evaluation according to the GDSS model was built (see Figure 2).

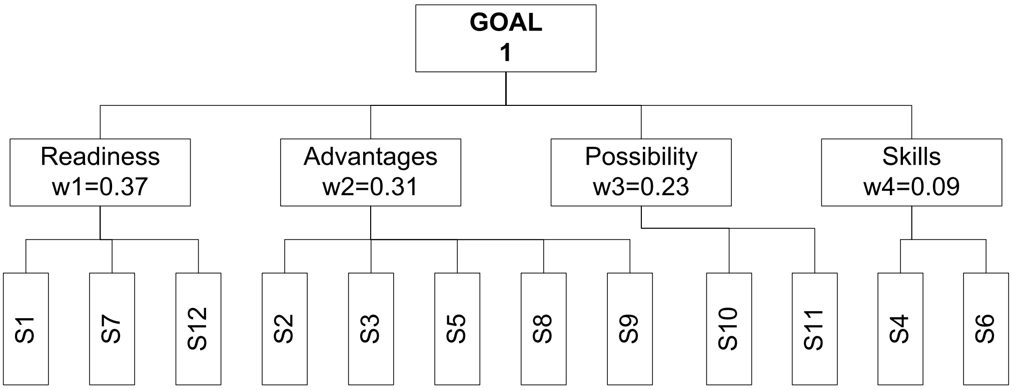

Figure 2. Decision-making tree for the multiple criteria evaluation according to the GDSS model

After the decision-making tree was built, the weights (see Figure 1) were defined with help of the Vote function, which provides a voting tool to help the group evaluate a list of alternatives. Further the survey among the three groups of students of Faculty of Organisational Sciences was carried out. Analysis of survey results according to the tree of failure will enable us to choose the right alternative for taking exams in the renovated (modernized) study programmes.

In the next part of the article the results of the survey and comparative analysis between the three groups are shown.

4. Results

A total of 54 students (20 females and 34 males) participated in this study. Ages ranged from 21 to 44 years, with a mean of 27 years and 5 month (M=24,4 years for females and M=29,2 years for males). Five males (14,7%) and three females (15%) have already participated in three e-exams in the average.

The majority of students (see Table 3) would introduce e-examinations as fast as possible. The comparative analysis showed that there were no significant differences between the three students groups. Statistical reckoning showed differences in less than 5%. As the convergences of the three groups are alike we decided to analyse the results jointly.

Table 3: Survey results by statements

	Strongly Agree		→		**Strongly Disagree**
	1	**2**	**3**	**4**	**5**
S1	48,1%	35,2%	11,1%	1,9%	3,7%
S2	77,8%	14,8%	1,9%	0,0%	5,6%
S3	29,6%	46,3%	11,1%	3,7%	9,3%
S4	29,6%	29,6%	13,0%	20,4%	7,4%
S5	42,6%	29,6%	14,8%	7,4%	5,6%
S6	37,0%	18,5%	11,1%	14,8%	18,5%
S7	9,3%	1,9%	14,8%	20,4%	53,7%
S8	24,1%	37,0%	14,8%	9,3%	14,8%
S9	40,7%	29,6%	13,0%	9,3%	7,4%
S10	77,8%	13,0%	3,7%	0,0%	5,6%
S11	72,2%	16,7%	1,9%	1,9%	7,4%
S12	38,9%	31,5%	18,5%	1,9%	9,3%

As seen in Table 3, half of the students strongly agree with replacing classic written or oral exams with e-exams (S1) and one third is veering to it. Only 5% of students are against the replacing classic written or oral exams with e-exams. One of the main reasons is probably the possibility of immediate feedback (S2), as was confirmed by four fifth of students. One third of the students strongly agree that e-examinations are far more interesting than classic examinations; e-examinations attract and motivate them more (S3). One third of the students also strongly agree with time limitation of e-examinations (S4). They think time should be limited to reduce cheating, to raise motivation and to reduce fatigue because of long lasting tiring examinations. More than half of the students think that e-examination is going to ensure objective evaluation of results (S5). For all three statements (S3, S4 and S5) the percentage of those who strongly disagree is relatively low. Students are anxious because they are not familiar with e-examination methods (S6). More than half of them are afraid that they will have problems with the technology when taking e-exams. Students do not think that e-examination is straining and tiring (S7). More than half of them strongly disagree with statement 7. More than 60% of students think that the up-to-date technology enables good control over examinations and reduces cheating (S8). About 40% of students think that knowledge should be tested instantly with help of e-examinations (S9) and another 30% veer to that. Students showed enthusiasm about the possibility to take exams away from the school (S10) and anytime (S11). This is a result of the social trend; lack of time and need of adaptability. It is interesting that when given choice between classic and e-examination (S12) only 38,9% of students would choose e-examination without second thoughts although almost 50% strongly agree with the replacing of classic tests. We think this is because students are afraid of new challenges and are not familiar with the new method of testing. This is also evident in former statements.

Because of the survey results we decided in accord with our management to start using a combination of electronic and classic examinations for the next generation of students. We will try to introduce e-examinations in all fields. Later on we will try to replace classic exams with e-exams where possible.

5. Conclusion

The information-communication technology has a profound impact on our society and a great potential to enhance education. Students have the opportunity of studying at home or in a virtual classroom without time pressure; they can study at the time most appropriate for them.

The feedback from the students involved in our survey confirmed the need of introducing e-examinations whether in classroom or in remote locations, synchronous or asynchronous, as fast as possible into learning process. There are different reasons for this. One of them is a very strong wish to be able to participate in exams at a preferred time and place. For some students this means writing exams at home, where they are relaxed and can be more focused.

The most important factors, which contribute to the positive relation towards e-examination, are immediate feedback and a freedom of choice of place of examination regardless whether exams are running synchronously or asynchronously. So a student can take an exam whenever he or she is ready to. Thus participation in exams requires less effort, and there is less fear and examination anxiety, therefore the students are more relaxed. Students are also more motivated and attentive, and that results in better test objectivity.

Students also stated negative opinions about e-examination mostly because they are afraid of technology and are not familiar with the methods of e-examinations. They have some doubts in time limitation and do not know whether it would be good or bad for them.

The research confirmed that students would like to introduce e-examinations as the main way of testing. But it will be necessary to overcome some technological obstacles and fear of novelty. Students must show more interest in acquiring knowledge and not in just passing the exams. It is our task to propagate e-learning and present e-examination to the students. Not only to be in sync with the modern society but also to make teaching and learning more attractive and to improve the speed of knowledge acquisition.

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FAKE ONLINE UNIVERSITIES AND FAKE DEGREES INTERNATIONAL AND SWEDISH TRENDS

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Applications for jobs and university studies on the basis of fake degrees have increased in Sweden and in other countries. It has been discovered lately that even some lecturers and researchers at Swedish universities got their positions thanks to fake Ph.D. degrees. The fake degrees are easy to obtain and create a whole range of problems. The validity of degrees is in question as well as the reputation of universities in general. There are also economic losses for universities, employers, individuals and society in general as a result of the unfair competition.

The presentation will provide an up-to-date picture of fake online universities – their strategies, the consequences of their activities, their target groups and victims. The study was undertaken by the National Agency for Higher Education in Sweden and Stockholm University. The source data are cases reported to the agency between 1998 and 2004, desktop research of relevant internet information, a literature review and frequent correspondence with international experts in the field (see reference list).

Fake diplomas are not new, but with new information and communication technology and societies' increased demand for formal competence, the practice has virtually exploded. It is not only the speed of delivery that has increased, also the number of consumers and the quality of the products and services has increased. Paper quality and water stamps can be replicated exactly as the original and today a wide range of additional services are also offered. A fake degree from a fake or real university worldwide can be purchased and obtained within days, often with a "letters of recommendation" from professors and a telephone back up service from the "university".

Fake university homepages have everything one could ask for: friendly staff faces and contact information; a "100-year history"; descriptions of courses and degree programs; and URL links to accreditation organizations and university networks. Fake universities often link with real universities to appear even more "real" and they even warn potential distance students of fake online universities. A wide range of tricks are used in order to conceal the real identity. Names that sound, or are spelled, similar to prestigious universities like Stanford or Harvard are often used. Domain names such as ".edu" do not guarantee authenticity and there are even fake universities listed in UNESCO's world list of universities because once a fake university obtains governmental acknowledgement it is listed. In recent years fake universities have migrated to weak and corrupt states, in response to tighter regulations at "home", where they can buy legitimacy to operate worldwide.

The study has a Swedish focus but the problem is international and comparisons with other countries' situations and methods of dealing with the problem are discussed. Finally a toolbox of recommendations and counter strategies is discussed, applicable at the: a) individual level; b) university level; c) national level; and d) international level.

A comprehensive report will be published in Swedish in February 2005, by the National Agency for Higher Education. Part of the text will be available in English. This is the first study of its kind in Sweden (and even in the Nordic countries?). The report and its findings is presented at the EDEN conference.

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A RECIPE FOR SUCCESS? A SURVEY OF BLENDED TEACHING STRATEGIES IN EUROPE AND AUSTRALASIA

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With changes in student demography, and particularly the growth in the market for lifelong learning, many course developers have turned to online media for teaching and learning. At the same time, there are challenges and tensions, particularly associated with widening access and retention issues. And very often tutors find that online approaches don't work quite as the books say they should. There are anxious questions, for example, is online learning appropriate for all students? Does it represent a cost effective use of the tutor's time? Are we supporting our students, or abandoning them?

Distance technologies have opened up new potential in higher and further education. They provide scope for new ways to access and combine information, using the limitless resources of the Web. And students at a distance, or separated from their peers for other reasons, need no longer work in isolation, but can join other learners in an electronically supported community. These developments offer the possibilities to develop greater self direction in learners, and to move away from teacher-directed approaches to teaching and learning. Instead of receiving information or knowledge from the teacher, the students can be encouraged to seek out information for themselves and to develop their understanding by reflecting on course concepts with their peers. In these new approaches, there is a greater importance attached to understanding, in preference to memorising and reproducing facts.

These are optimistic horizons. But at the same time, not all students like learning exclusively online. They may not participate fully, or even vote with their feet. Some recent work (Price, Jelfs & Richardson, 2004) suggests that students who study online are less academically engaged, and view online tutoring as having lower quality than conventional face to face support. Indeed, the importance of establishing relationships, through both formal and informal interactions, in contributing to social and academic integration, is well documented as critical for student retention (Tinto, 1993). Tait (1996) emphasizes the importance of conversation and community, and Simpson (2002) refers to the need for affective, as well as cognitive or organisational skills, in supporting learners. Perhaps a blended strategy might be an effective answer to this dilemma?

Blended learning or blended teaching strategies?

The term "blended learning" is something of a hot topic nowadays, but like the term "e-learning", everyone has a different understanding of precisely what it means. Early references to blended learning come from industry and workplace learning, although recently it has become more widely adopted in Higher Education institutions.

Clearly, from its inception, the term had a variety of meanings. Masie lists a range of options:

- "blending classroom instruction with on-line instruction
- blending on-line instruction with access to a coach or faculty member
- blending simulations with structured courses
- blending on-the-job training with brown bag informal sessions
- blending managerial coaching with e-learning activities".

(Masie, 2002, p 59)

The term is now popular in Higher Education circles. For example, in a recent special issue of Journal Educational Media devoted to blended learning, Kerres, & De Witt (2003) refer to "all combinations of FTF learning with technology based learning"; Boyle et al (2003) describe a full course redesign, which included an identification of those areas of the course which were difficult to understand; an appraisal of existing use of lectures, and revision of the staff student ratio, alongside the introduction of a new e-learning environment. O'Toole & Absalom (2003) refer to an approach where students are offered a choice of lectures and tutorials or alternative online resources. These descriptions are far more about teaching strategy, course delivery and support than they are about student learning, although we hope that student learning is very much influenced by what we do as educators. I have therefore adopted the term "blended teaching strategy" which I define as "The adoption of the deliberate, or intended integration of online asynchronous, or synchronous strategies and media, with other elements of teaching strategy".

There has been a convergence of interest from both campus based and ODL contexts in the concept of blended teaching strategies, and the two contexts are not as far apart as they once were. A comparative study of learner support on the SOLACE (Supporting Open Learners in A Changing Environment) project at the UK Open University and Glasgow University (Macdonald & McAteer, 2003) illustrated how in both distance and campus environments, use was made of a variety of media to provide a range of support functions to their student groups. Clearly there are many differences between the two contexts, yet we established that many of the principles underlying effective strategies apply in both settings, with common concerns over appropriate media use. However, the acceptability and feasibility of a particular learner support strategy and the choice of communication tool depended critically on the overall environment, and the alternatives available. After all, distance students operate in a rather different environment to campus based students, and may rarely have the luxury of meeting colleagues and staff regularly in a face to face setting. This context is very likely to impact on the acceptability of all elements of a blended approach.

The SOLACE project fuelled our interest in blended teaching strategies, and the literature contains little more than case studies of individual courses. We therefore decided to undertake a survey into current practice and practicalities, to gain an overview of the major issues, common trends, and useful lessons to be learnt across countries and institutions.

Methodology

We posted a short questionnaire to a variety of academic mailing lists, in addition to writing to individuals who were known to have presented papers on blended learning at a variety of e-learning conferences over the past year.

Mailing lists have in recent years become established as a way of keeping in touch with academics in a wide variety of disciplines. They are favoured as a way of posting notices about forthcoming conferences and other events, job opportunities, and the occasional forum for debate, although such debate rarely extends beyond a couple of days. They are subscribed to by large numbers of individuals across a wide variety of institutions. Since emails of interest are readily forwarded to colleagues, they potentially have a much wider readership than is formally joined to the list.

The questionnaire was circulated through the following lists, giving coverage to the UK, and other parts of Europe, and Australasia, although it was clear from the returns that membership of such lists does not respect formal geographical boundaries. For example, the Jiscmail lists yielded replies from New Zealand and Hong Kong, in addition to the UK response, while EURODL clearly had subscribers in North America, in addition to many European countries.

Jiscmail	16
EURODL	15
Ascilite-general	8
Personal contacts	9

As with any input to an online conference, where many of the readers are unknown to the writer, the experience was un-nerving – a rash of acknowledgements, followed by silence, and then the arrival of fascinating and unexpected messages. Some 48 returns were received from 37 institutions in 17 countries. In addition, some recipients wrote simply to contribute resources, while others engaged in sometimes protracted debate on the subject of blended teaching strategies. We were able to reply to many respondents with further questions and points for clarification. The data which we have collected therefore is from an opportunistic sample of practitioners and staff developers who have first hand experience of blended teaching strategies on their courses, and were willing to share their experiences.

We are still in the process of collating the data. The quantitative data will give a comparison of courses, students and media use in the various institutions. The qualitative data is being analysed, by repeated reading of the questionnaire returns, in order to identify common trends in the factors influencing the adoption of blended strategies. The aim is to derive as full a picture as possible of the variations in perspectives of respondents, based on the principles of constant comparison (Glaser & Strauss, 1967). The account which follows illustrates trends which have emerged so far. The full account, together with information on those courses and institutions who participated, will appear in a book to be published at the end of 2005.

A strategy for lifelong learning

Three quarters of respondents had mature students, between the ages of 20 and 40; and in fact only two respondents described courses which catered to students who were under 20. It was clear that our respondents were adopting blended strategies to accommodate lifelong learners.

About half of the respondents described the need to provide more flexibility in their course, in response to variety of factors. For example, many referred to geographical distances, while others had to cater for an increase in student diversity, and a variety of study routines, imposed by students' work-based and other commitments.

> *...our students come from all over Austria and from abroad: blended learning helps them to save money because they learn at least 50 per cent from at home. (Vienna Univ of Economics and Business Administration, Austria)*
>
> *We were also very aware, from discussions with our industry partners and from our own market research that we needed to accommodate full- and part-time students as well as those wishing to undertake individual modules for CPD. (Perth College, UHIMI, UK)*
>
> *Using a blended learning approach, companies can minimise the time that workers are released for training and engage the worker in self study on the company premises or at home in their own time... This course takes account of the work patterns and social needs of the learners. The model uses a flexible approach and a blend of different modes of access to training. (Foras Aiseanna Saothair, Ireland)*
>
> *A decade ago our student cohort comprised a significant full-time, on-campus group as a result of an employer supported teacher education programme... The demise of that employer support, together with changes in the Vocational Education & Training (VET) environment, has seen our cohort becoming increasingly diverse, with many students having to juggle work and family commitments alongside study. (Griffeth Univ, Australia)*

In fact, such considerations have long been familiar to any institution adopting open and distance learning techniques to accommodate the needs of its students, and are probably more associated with a requirement for asynchronicity, and choice, than a need to be online. But arguably it is with the availability of online media that such strategies have become more cost effective.

Harnessing technology to develop lifelong learners

A wide variety of technologies were described, however, the commonest technology to be deployed was online asynchronous conferencing, alongside face to face meetings, by the vast majority of respondents.

The potential benefits of adopting asynchronous online environments were widely recognised, in terms of opportunities to develop independent self-directed learners, providing a good foundation for lifelong learning, and in some cases, offering greater choice to students and a wider range of teaching approaches.

> *Provides choices for them in the way they want to be supported - can choose to have support through weekly lab sessions OR e-mail/phone contact -- encouraging them to take responsibility for their own strategies. Students are at vastly different levels in terms of their own skills. Putting all students together in the same learning environment considered inappropriate. -- students are responsible for setting their own goals and choose their own pathway through the content. (Southern Cross Univ, Australia)*

> *To promote a new way of learning through group dialogue, negotiation and interaction. (Istito Tecnico Agrario Statale, Italy)*

> *Basic aims of the redesign were: fostering 'active learning', giving students continuous support, fostering the 'application' of declarative and procedural knowledge, and developing self-evaluation skills of students. (Ghent Univ, Belgium)*

These observations are very much in line with current thinking on the benefits of self directed approaches to learning using online media, and are generally associated with course pedagogies such as collaborative, problem based, resource based or activity based learning (Macdonald, Mason & Heap, 2001; Macdonald & Twining, 2002). Indeed 5 respondents had adopted problem based learning as a central part of their strategy.

As to the integration of asynchronous online working with face to face meeting or synchronous alternatives, the respondents were, as a group, self confessed "blended strategy" adherents, and therefore it came as no surprise that many were convinced that online asynchronous working was enhanced by face to face contact, or that face to face discussion could be extended through online asynchronous activity. Some of this was based on personal experiences or action research with distance technologies.

> *For the first two years of this module, it had been delivered entirely online; specific problems developed with this approach have been outlined in Donnelly (2004a). In the light of these problems, it was decided to adopt a blended approach to delivery, in that weekly face-to-face problem-based learning tutorials would be supported by online learning events e.g. exploration of online resources, collaborative research, online reflective journaling, self and peer assessment. (Dublin Institute of Technology, Ireland)*

> *From experience, students don't learn through one method. Therefore a blended learning strategy provided a richer information base for learning. I have used this method in several situations. (Aston Univ, UK & Halmstad Univ, Sweden)*

> *In this respect, the online discussions do not replace the face-to-face discussions, but both collaborative approaches run parallel. The main goal for introducing the online discussion groups was to expand students' opportunities to get in touch with each other in order to discuss and reflect on medical cases. Face-to-face discussions focus on the diagnostic process and start from the patients' presenting problem. (Univ Ghent, Belgium)*

There was less consensus from respondents on the contribution of face to face, or synchronous alternatives to the blended strategy. While there was a general feeling that the synchronous element was important, respondents described a wide variety of contexts in which it was presently in use, whether for content delivery, or the targeting of advice, the pacing of studies, or the practising of skills. Others commented on its contribution to community building, or for brainstorming, or decision making, or for final coursework presentations. It may be that this lack of consensus is because face to face contact is a teaching strategy which has 'always been there', or perhaps the benefits are considered too obvious to be recognised?

A recipe for success?

The term "blended strategy" is not particularly scientific, or even academic, in fact, you might feel that it sounds rather more like something from a cook's recipe book. This survey is unlikely to yield a recipe which indicates how much asynchronous contact might profitably be blended with face to face, or synchronous options, indeed, how could it cater for all contexts? In fact, Ehrmann reminds us that technology should be "an ingredient, not a recipe" (2002, p15). However, I believe the term has some good, commonsense value, in bringing to the fore the wide variety and richness of situations in which learning takes place. It encourages us to stop and think about the whole context of teaching and learning. It may also encourage us to reflect on ways in which we might optimise those teaching situations which are most familiar to us: those which take place face to face.

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APPROACHES FOR SUSTAINABLE E-LEARNING IN AFRICA IN GERMAN DEVELOPMENT COOPERATION

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Introduction

In the last few years there has been a growing demand on development cooperation agencies to support the increasing number of ICT based educational projects and networks in Africa and Asia.

Germany has already positively reacted to these requests. There are now a number of eLearning projects supporting universities in Africa and Asia. The main aim is to provide better access to and more efficient distribution of knowledge and to enable knowledge owners to produce or adapt eLearning contents rapidly by themselves. Furthermore the cooperation between academic institutions across borders and continents are supported in order to create South-South learning networks.

This presentation sheds some light on the development of eLearning projects supported by German development cooperation in Africa. It first reviews the evolution of donor supported academic knowledge networks. It then provides some insights into emerging ICT based knowledge-networks in Africa initiated and supported by German development agencies.

Two examples for the evolution of academic networking and partnership are presented:

- A well established knowledge network on environmental issues in the Southern African Development Community: SANTREN.
- The emerging national eLearning system in Ethiopia.

The paper also highlights the need for organisational changes and suggests a blueprint for eLearning capacity building in developing countries.

The role of "Knowledge Building" in Development Cooperation

It was in the mid 90s that development cooperation became significantly influenced by a new appraisal of the role that knowledge plays as a central economic resource.

In 1998 the World Bank published the World Development Report "Knowledge for Development"[1] accompanied by an extensive study by the United Nations Commission on Science and Technology for Development "Knowledge Societies – Information Technology for Sustainable Development"[2].

These publications were important cornerstones for the ongoing debate and provided a new theoretical framework for many development cooperation agencies and their programmes. Access to and distribution of knowledge became a core element of development cooperation. And ICTs as the powerful platform for knowledge production, representation, enhancement and distribution anywhere and anytime was seen as the great enabler for this only resource that grows with its consumption.

Development agencies started to emphasise the role of knowledge in their programmes and embarked on a couple of bold and pioneering projects in which ICTs became a prominent function. In the late 90s the World Bank launched the "Global Development Learning Network" and the "African Virtual University".

Today we witness US$ multi-million and multi-billion "Knowledge Building Programmes" based on ICTs. The Japanese "Comprehensive Development Package" with US$ 15 Billion and the Australian "Virtual Colombo Plan" with US$ 750 Million are two recent examples. [3]

This new strategy has, however, not been without criticism.[4] It is argued that the reasons for failed development cooperation programmes in the last two decades are not necessarily addressed by the new orientation towards knowledge-building. Experts claim that knowledge might not become the powerful change agent if it does not address and take into account of the "lack of ownership of development; the dogmatism of donors; the authoritarianism of African states; decontextualised policies and the lack of relationship between state and intellectuals"[5]. Furthermore many of the on-going projects are regarded as not taking into account the context- and complexity-rich world in the South but rather impose a view that the world is simple, linear and quantified. They are seen as being imposed from outside and weakening local capacity-building in knowledge development.

This ongoing debate provided a conceptual frameworks of a new breed of development agency projects in which knowledge-building was now understood as social and networked and as an active process of learning. In these projects knowledge is defined as a "process of active engagement with the world in which the construction of identity and the mediation of group membership are as important as the development of knowledge" itself [6]. The projects described in this paper intend to support communities of practice in the South and the development of an organisational learning culture as part of development cooperation.

Five criteria for good practices in "Knowledge for Development" projects can be identified. There should be a focus on supporting:

- contextual local knowledge;
- the southern stakeholders to become development actors;
- southern ownership;
- openness to local context and complexity and
- local values, concepts and practices.

The projects described below do have local ownerships to various degrees. With regards to "openness to local context and complexity", they are good examples for coping with an overwhelming complexity in their local environment. The Open Source technology approach within the projects enables the production and representation of contextual local knowledge. Furthermore the applications provided allow the southern stakeholders to become the actors in all elements of the value chains.

The Southern African Network for Training and Research on the Environment, SANTREN

With about 100 members and institutions, SANTREN (http://www.santren.com) is the largest research network in the Southern African Development Community (SADC). It has been supported since 1996 by two development cooperation agencies from Denmark and Germany, DANIDA and InWEnt. The main stakeholders in this network are the University of Zimbabwe, the University of Daressalaam, the University of Zambia and the University of Botswana.

One prominent line of action of SANTREN is to help the mining industry to administer information on the environment, to provide access to environment databases and to provide training for environment experts, mining workers and managers.

In April 2001, an Open Source based publication platform for the SANTREN institutions, which are scattered throughout southern Africa, was set up. The Internet publishing system enables the experts in the region to produce and publish content on the Internet in a decentralised and collaborative manner using just a browser. Authors can administer their courses and focus on their strength which is providing high quality content.

This valuable knowledge had previously not been visible for potential international customers. There had been no representation facilities and no distribution channels for the African knowledge owners. SANTREN is a good example for southern knowledge becoming available with a competitive edge.

The geologists within SANTREN have a long track record for environmental research and services. They work right in the mines as well as with the workers in the small-scale mining fields. Their knowledge is highly relevant and contextual and they are recognized in their international community of experts. The publishing and content management applications provided at their website enable these geologists to offer their knowledge and knowledge-related services to the mining industry more efficiently in their country and also to other regions of the south – with significant competitive advantages.

SANTREN seems to be a good example of how ICTs combined with a training programme can create an enabling environment for southern stakeholders. Their ownership of the network and the publication platform allows them to further develop their contextual knowledge, to offer enhanced services and to generate revenues that make their undertaking a sustainable business.

The Networked Universities in Ethiopia

The Ethiopian government views ICTs as key enablers for the implementation of the country's development programme. The aim, further described in the National ICT Capacity Building Programme, is to "develop and exploit ICTs as an accelerator for the attainment of national development objectives and global competitiveness." [7]

In September 2004 the World Bank launched the US$ 32 Million "Ethiopia ICT – Assisted Development Program – ICTAD" which will support the formulation and implementation of policy and institutional reforms in the Information and Communications Technology (ICT) sector.

"An important objective of the Government's development program is to increase communities access to information and communication services and Internet connectivity. The improved access to communications tools will diminish the urban-rural economic disparity, provide access to market information for enterprises, and enhance service delivery in health, education, and many other areas."[8]

ICTAD is not the only ICT for Development programme in Ethiopia. It complements a number of other bold initiatives that build on a cutting edge powerful national ICT infrastructure being implemented in 2003/2004 by the Ethopian Telecommunication Corporation with a consortium of Cisco and Ethiopian IT companies:

- UniversityNet: all 12 Ethiopian universities have been networked and are now being gradually equipped with eLearning centers;
- SchoolNet: 500 secondary schools including TVET schools are already networked via a VSAT system and are now being gradually equipped with eLearning centers;
- WoredaNet: 600 local government and administration units (Woredas) will be networked and equipped by the end of 2004;
- AgriNet: it is planned to network 30 agricultural centers by the end of 2005;
- HealthNet: it is planned to network all reagional hospitals and to introduce tele-medicine applications.[9]

The challenge is now to build the necessary human resources so that the technical infrastructure and applications can be maintained and used by all stakeholders, be it students, professors, teachers, administration staff and health personnel.

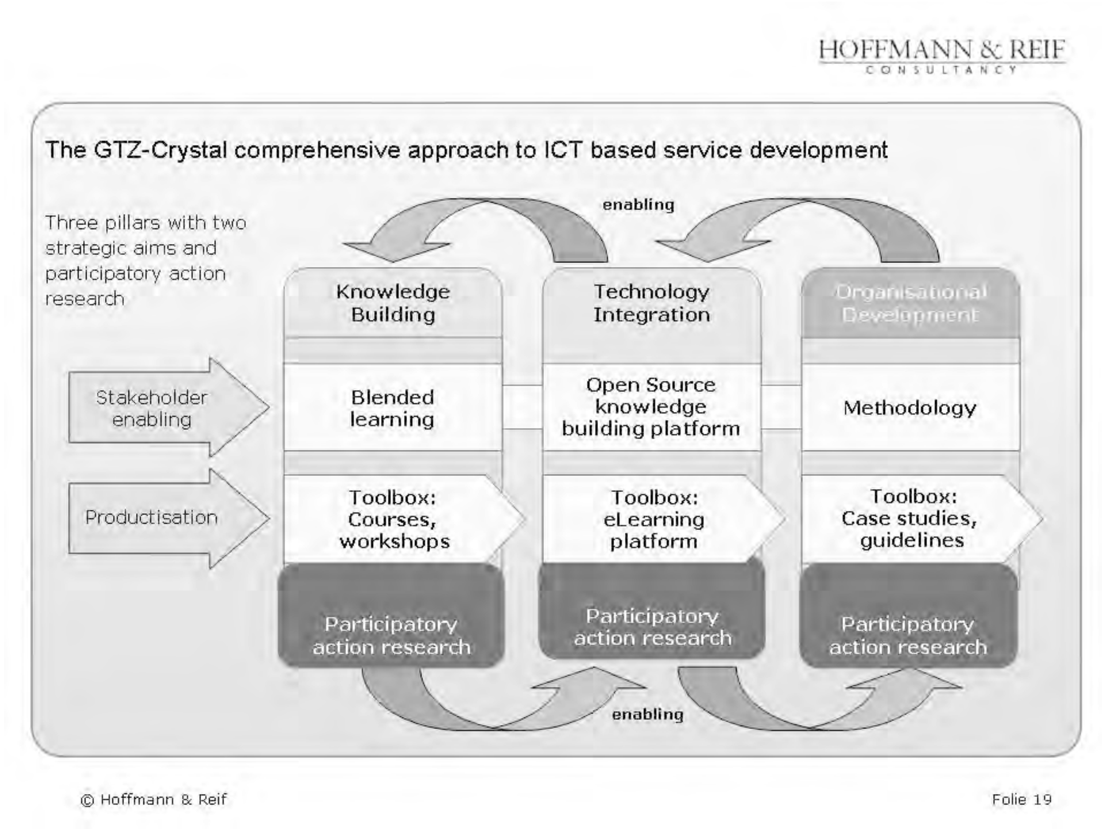
The World Bank and ICTAD views the "Civil Service College – CSC" in Addis Ababa as a key capacity building provider for the emerging networks. Through the "Global Development Learning Network Center – GDLN" – hosted at its premises – the CSC has established a good record of providing eLearning services to executives and policy makers of the government and the civil service with a focus on video conferencing. Therefore the CSC is today very well positioned to offer additional eLearning capacity building measures also to other target groups within the public service and beyond.

Offering capacity building to local authorities will broaden the mission of the CSC by reaching out to new target groups in rural areas and serving their demands especially in vocational training on administration and management. Furthermore the new emerging ICT networks for the local authorities (Woredas), universities, schools, hospitals and agricultural centers, demands from the CSC to rapidly build media competencies in the public service so that the new ICT facilities can be mastered.

In order to embark on the new perspectives described above, the CSC is currently building appropriate capacities in producing, maintaining, marketing and delivering vocational eLearning content and providing comprehensive eLearning services. An organisational framework will be established, that supports the new mission and that eventually will lead to a national eLearning competence center within the Civil Service College.

The Blueprint of an eLearning Capacity Building Framework

Development cooperation experts point out that capacity building needs to be accompanied by organisational changes in which new skills can become embedded. It is seen as an important output indicator that in parallel to human resources development an appropriate organisational infrastructure is built in which newly acquired qualifications can make an impact.



In the context of development cooperation capacity building needs to result in the transfer of productised "tool boxes" which can be re-used and adapted. Too often training is delivered without an agreement on how the new capacities are supposed to generate change at the workplace. The ownership of "tool boxes" facilitates organisational change, the integration of new technologies and the up-take of new services into the service portfolio of the educational institution.

It is against this background that together with educational institutions in Africa and Asia German development cooperation agencies have developed a blueprint of a capacity building framework that integrates knowledge building, ICT and organisational development. [9]

This framework, shown in the graphic above, aims at “Stakeholder enabling” and the “Productisation” of educational services and builds capacity incrementally within an organisational change process.

“Organisational Development” is highlighted in this framework because it is seen as the key activity that allows a sustainable implementation.

Conclusions

SANTREN and the Ethiopian national eLearning programmes are both aiming at enabling knowledge owners to represent directly their knowledge through media via an already existing ICT network infrastructure. The advancement of learning applications makes it possible that academic subject matter experts cover elements of the educational value chain that in the past could have only be handled by publishing experts and expensive external services.

The establishment of a national eLearning Competence Center in Ethiopia will provide the organisational framework through which the acquisition and further distribution of eLearning skills and eLearning programmes will be achieved. Furthermore the eLearning Competence Center will ensure that productisation and distribution of training will meet the requirements of all universities and schools.

It is assumed that the direct representation of content by its owners – supported by an appropriate organisational framework and advanced ICTs – will result in a higher degree of authenticity, contextuality, adaptability, cost-efficiency and time-to-market of content.

Manuel Castell has described this new potential in his unsurpassed words: “Unprecedented productivity potential can be achieved when appropriate applications – and I may add here: the appropriate organisational frameworks – empower humankind with the ability incessantly to feed knowledge back into knowledge and experience into experience” [11].

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COMMUNITY BASED LEARNING VIA LEARNING COMMUNITIES: A JOINT U.S. – IRISH PERSPECTIVE

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Context

Communities throughout the world are experiencing rapid rates of change. Learning – lifelong learning and meaningful adult education – is critical for communities to cope with these unprecedented changes. Lifelong learning is at its most effective when applied in community contexts. It also requires an attitudinal and cultural change on the part of governments, policy makers, education providers, learners and community actors. The learning community approach utilized at many institutions of higher education in the United States is one community model for supporting learning that has demonstrated educational value. Recent collaboration between educationalists in Ireland and the United States has focused on attempts to explore and develop community based lifelong learning strategies utilizing innovative pedagogies.

After a discussion of the nature of change occurring in Ireland, the theoretical foundations and educational outcomes of learning communities will be outlined and the methods by which this approach might best be adapted to communities' needs for lifelong learning described.

Change and Irish communities

In attempting to understand the present and future contours of Irish communities it is essential to appreciate that Ireland has been at once more complex and less cohesive than normally assumed by its economic policy commentators.

The depiction of Ireland as a homogeneous and uniform cultural polity is a recent one. It has its origins in the settlements achieved by the Land League, the pervasive cultural influence of the Roman Catholic Church in the post-Famine era and the inert conservatism of the two States which emerged from the Partition settlement.

For our purposes, the key point is that Ireland has never been a uniform or agreed socio-political entity. The nature of Irish society has been a fragmented, divided and polyglot one. In its very fibres, Ireland has been a laboratory of difference. Its cultural mosaic has encompassed layers of identity not to be expected in a remote offshore island. Its discontinuities and divisions have however been the source of extraordinary creativity and interplay, where no one culture (Celtic, Gaelic, Danish, Norman French, English, Scottish, Flemish, Jewish or Huguenot) has had a monopoly of Irishness.

This diverse Ireland is presently grappling with the revelations of corruption, institutional abuse and extensive networks of denial and cover-up. It is also witnessing the end of old certainties. The cohesive rural society of the past exists no longer – if it ever did. Profound transformations in community have been in evidence from urban sprawl, to the decline of agriculture to the growth of service based employment with a commuter culture. In its educational, social, institutional and commercial spheres Ireland is in process of profound community transformation. The uncertainty and shock stemming from disclosures about the scale and extent of abuse, for example, have had as much to do with locating political responsibility as loss of faith in the traditional self-image of a caring and supportive community.

A clear sense of these past realities is essential to grasp the contours of the present and the possibilities for inclusive learning in the future. In its economic aspect, Irish society remained on the periphery of economic development for many decades. Such industry as existed functioned behind protectionist walls. The haemorrhage of emigration exported millions of citizens who could find neither jobs nor status in their own country.

The reversal of these trends is relatively recent. The memory of their impact is however potent. Economic development, the creation of jobs and the reversal of emigration have been due to a variety of factors. The positive roles played by enhanced education, social partnership, improved accountability and community development need to be acknowledged. On the other hand the fact that all these improvements were also largely reactions to external stimuli and pressures pinpoints the often subsidiary and derivative nature of Irish social and economic policy formulation.

Ireland exists now, both de jure and de facto, as part of a wider world. Its trends and characteristics mirror those of other societies. Its challenges and opportunities echo those of other nations undergoing similar processes of social transformation. As it once exported its own people, Irish society now receives those exported from the underdeveloped world. This points to a new dynamic in the reconstitution of community. Exposure to the external world has not only happened because of new migrants arriving. Many thousands of Irish expatriates have also returned – bringing with them very different expectations and experiences of what Irish community means.

The traditional depiction of Irish backwardness and underdevelopment has a strong parallel with contemporary depictions of social exclusion. Under every category employed, Irish society could be viewed *in toto* as a metaphor for under-privilege and disadvantage. The structural inequalities were built into a fragmented and discriminatory polity. As the decades of disadvantage unfolded in the twentieth century, Ireland seemed unable to emerge from the social, economic and cultural constraints that impeded its development.

Decades of deprivation, emigration, political violence, sexism, unemployment and disadvantage are not overturned by a few years of prosperity. More importantly, the attitudes, practices, rationalizations and understandings of those decades persist, and persist profoundly, in the social and economic practices of modern Irish communities.

The emergence of a focus on rights for minorities, the transformation of the demographic composition of the population, the impact of advanced technologies, the decline of agriculture, the mutation of the traditional family and the sea-change around the role of women have, together with sustained violence and community polarization in Northern Ireland, been the key features of Irish community development over the past three decades.

Theoretical Foundations and Impact on Learning Outcomes

Traditional learning communities in the United States date back to the 1920s, when the philosopher and educational theorist Alexander Meiklejohn helped to establish the short-lived Experimental College at the University of Wisconsin (Smith, 1991; Tinto, 1995). The practice resurfaced and gained prominence in the 1980s, driven in part by funding from Ford Foundation and the U.S. Fund for the Improvement of Higher Education (Lenning and Ebbers, 1999).

Many forms and definitions of learning communities exist (Zhao and Kuh, 2004). In practice, learning communities take four generic forms (Lenning and Ebbers, 1999):

- Curricular learning communities are composed of a cohort of students enrolled in common courses during an academic term that are linked by a common, often interdisciplinary, theme.
- Classroom learning communities operate within a specific class; cooperative and group learning processes characterize these approaches.
- Residential learning communities provide students the opportunity to live with a small group of students with a common major or area of interest. The group takes classes and participates in co-curricular activities that are designed to enhance this educational process.
- Student-type learning communities target specific groups of students, such as honors students, students with disabilities, or academically underprepared students.

Although they have many basic forms, learning communities in the traditional school environment share two common academic elements: shared or collaborative learning and connected learning (Pascaralla and Terenzini, 2005). In general, collaborative learning activities group students together to explore or apply the course material; these approaches have been linked to significantly enhanced learning (Pascaralla and Terenzini). Collaborative learning in the curricular learning community model emerges as communities enroll the same students in several common courses, thereby increasing the likelihood of an integrated social and academic experience. Connected learning, in turn, encourages students to connect ideas from different disciplines. This emerges in the learning community model from the fact that the shared courses are organized or linked around a single theme (Pascaralla and Terenzini; Zhao and Kuh, 2004).

As a result of these two common academic elements, learning communities represent a constructivist approach to knowledge (Cross, 1988), encouraging students to socially construct their own knowledge rather than simply accepting the information transmitted by the instructor. "As a result, learning is deeper, more personally relevant, and becomes a part of who the student is, not just something the student has" (Zhao and Kuh, 2004, p. 117).

The cooperative and connected learning environments established as part of a learning community promote both academic and social engagement (Johnson, Johnson, and Smith, 1998; Pascarella and Terenzini, 2005; Tinto, 1997). Decades of research on academic engagement, operationalized as effort or involvement, suggests that, other things being equal, the more the student is psychologically engaged in academic and academic-related activities and tasks that reinforce and support the formal academic experience the more he or she will learn (Pascarella and Terenzini). In terms of social engagement, the collaborative nature of learning communities promotes student-to-student interaction and student-to-faculty interaction (Ewell, 1994); both types of interaction are correlated with improved outcomes for students (Pascarella and Terenzini; Tinto, 1997).

Meeting Needs for Lifelong Learning – Keeping Up with Technology

How then do we work with the needs of the community to create adult learning communities, and what are the boundaries of such communities? One answer lies in the ever developing world of distance learning and technology. The learning community loses its boundaries with even the most common of current technology, such as on-line learning. It gains even more life and vitality through audio and video conferencing. As the cost of such technologies diminishes, the only limits become the vision and imagination of the learning community itself.

One example of this is the continuing connection of teachers and learners that has resulted from a cohort of Irish adult learners who received their M.Sc. in Rehabilitation Counseling from an American mid-western university from 1997-2000. That group of originally 20 Irish adults and their mentors has remained connected over distance, not only with each other, but with a cohort of teachers in both Ireland and the U.S. The group has: continued to create new learning opportunities such as video theses presentations; created and greatly influenced the work of a consortium of universities involved in continuing adult education and grant seeking opportunities; created and maintained a local Irish chapter of an international professional trade association; and managed attendance and participation in international conferences, using distance techniques and technologies.

In 1997, most of the cohort had to be introduced to email. Now the advanced technologies have in many cases made these formerly naive adult learners the front-runners and early adapters of technology in their disability related work places. The group have teamed with the Irish institution which hosted the course and the technology in the creation of a new certificate course in Rehabilitation and have become the faculty for that course. From modest beginnings, this group has maintained a learning community which could someday be the source of the creation of the profession of Rehabilitation Counseling in Ireland and the rest of the EU. That learning community has expanded its influence and value in both cultures across the Atlantic in ways that would have been impossible to imagine without the aid of technology. The fact that it even still exists in 2005, speaks to the value of a living learning community and the value of technology as its arteries, veins and fascia.

Conclusion

Lifelong learning is at its most effective when applied in community contexts. It also requires an attitudinal and cultural change on the part of governments, policy makers, education providers, learners and community actors. Community based learning, particularly in its lifelong earning and adult education initiatives, requires more than government intervention or formal policy statements. Local communities must themselves be actively involved and committed.

First, society as a whole must:

- value learning;
- support those who continue to learn;
- make learning part of their country's culture.

Second is the issue of resources – this is a perennial problem. This can be addressed at community level by affirming and promoting the notion that education serves the community in many ways. These extend far beyond the purely economic concerns of society. Social change is mediated and can be directed at community levels if learning is pro-active and centred on community needs.

The community is based around the need for learning in a variety of ways and levels. These encompass:

- community development;
- social solidarity;
- the role of volunteering;
- environmental management and conservation;
- social inclusion measures;
- religious bodies and groups;
- arts and culture;
- sports and leisure;
- health and well-being.

At times of significant social change communities need to be re-defined in such a way as to be meaningful to the individuals who live there.

Community appropriation of lifelong learning and meaningful adult education entails a greater responsibility for growth and advancement lying with the individual. With respect to community development, individuals need to start seeing themselves differently. They need to see the importance of managing their own careers and to accept responsibility for learning across a lifespan – not just while in school.

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THE BACHELOR IN MANAGEMENT LEADERSHIP – A FIRST OF ITS KIND IN SOUTH AFRICA

Helena van Zyl, Mana Wessels, University of the Free State, South Africa

Introduction

The South African management landscape is characterized by the presence of a vast number of managers with substantial experience, but no formal tertiary qualification in this field. In many instances this situation has been caused by either a lack of opportunities in the past, or failure to comply with entrance requirements set by tertiary institutions. The FAIS Act of 2003 (Financial Advisory Intermediary Act) is, for example amongst others, a demonstration of the lack of formal management education in the financial services industry requiring further learning for employees in this industry. The University of the Free State has the answer to the above described needs, namely the Bachelor in Management Leadership (BML).

This paper aims to tell the success story of the BML qualification offered both on-campus and online by the University of the Free State. The BML is an excellent example of creating a learning opportunity for adult learners who never had the opportunity to study before. This paper is not a theoretical or research exercise, but an effort to introduce other countries and higher education institutions to a value-adding qualification providing in the need for managerial leaders in South Africa.

The paper will focus on the establishment of the qualification, the teaching methodology, the therapeutic value of the programme, curriculum design and recognition of prior learning. The presentation of the paper will also be supported by a video clip.

The establishment of the BML

The idea for the Bachelor in Management Leadership (BML) was conceived in 1992 during an informal workshop initiated by Bennie Anderson and held at the University of the Free State. The target audience was adult workers interested in studying at a university. These workers had years of experience in their respective fields of work, but no formal qualifications for gaining access to university studies. Several follow-up meetings resulted in a formal workshop held under the auspices of the then Centre for Academic Development at the UFS.

A proposal for financial assistance was forwarded to the Joint Education Trust (supported by the Ford Foundation). Two grants were allocated for research and development work on Assessment of Recognition on Prior Learning (ARPL). Bennie Anderson took the helm as project leader. He aimed to publish the results as part of his PhD dissertation.

At that time DePaul and CAEL joined hands with the University of the Free State to facilitate several workshops and interviews with, amongst others, the following stakeholders: Transnet, UFS, Provincial Government of the Free State Province, Standard Bank, Telkom, Escom, Hollard Insurance, FNB, JET, and Nehawu.

In 1997 the first pilot group of fourteen adults was given access to the University of the Free State. In 1999 the first group of forty students was enrolled in the BML programme at the UFS School of Management.

The philosophy underpinning the programme

The uniqueness of the BML is that it is a management leadership degree programme specially designed for working adult learners, based on experiential learning, the assessment and recognition of this prior learning. The RPL process establishes access into the programme, advanced standing in the programme and the re-designing of the curriculum by the valuing of learner experience in the classroom.

At the heart of the program lies the mode of an experiential learning process that will take the learner through a natural development from discovery to integration, from application to synthesis and sharing knowledge. Learners obtain credits for each module successfully completed and are challenged to demonstrate his/her ability to integrate the three domains in a final project or major piece of work regarding a personally identified focus area. Amongst other, the learner will do a final presentation where the integration of acquired skills and learning is demonstrated.

An e-learning edge

Against the background of South Africa's political history many people "suddenly" find themselves in managerial positions, not only in the cosmopolitan areas but also far into rural districts. Add to this predicament, the University of the Free State is currently the only higher education institution in the country offering this specific degree course with its access to higher education without the former formal entry requirements which results into people forced to discontinue their studies when they for instance get transferred to other areas.

This challenged the School of Management to create a different route or mode of delivery for the BML without sacrificing the core philosophy of the program. A joint venture was therefore launched between the University and a company called eDegree to offer the degree online. Due to the emphasis also on leadership and the interactive nature of the program, online students need to attend at least three contact sessions on campus during their four year of studies while weekly chat sessions are compulsory for all registered on-liners.

The fact that the same lecturers are used for campus and the e-learning leg, help to assure not only quality but produce a fruitful interaction of ideas among people of many different circumstances, work environments and cultures.

The teaching methodology core to the programme

The programme is designed to engage learners in active and collaborative (participative) learning. This is often in the form of group discussions, learning activities, essays, reports, and debates amongst other learning-by-doing activities. Assessment and recognition of prior learning is done via portfolio documenting previous coursework, learning from life and work experiences and independent studies. In this way learners can demonstrate the competencies formulated in the outcomes for each module and earn credits without repeating learning from previous experience. This description of compiling a personal portfolio is a well-known and accepted method of documenting prior learning.

Continuous assessment *that is formative* (students develop and learn from each assessment through comments and feedback by lecturers) *and summative* (on conclusion of a module students submit or present an assessment, or apply his/her knowledge by means of case studies) *in nature* forms part of the curriculum design and allows the student to learn from experience.

Capacity building in the form of literacy and numeracy skills as well as presentation skills, time management and problem-solving skills are *integrated* into the content of modules. Written assignments form an important part of integrating the learning process. A rigorous set of specific criteria matched to the outcomes for each module is used as the basis for detailing learners on all assignments.

The therapeutic (developmental) value of the programme

Applicants must pass through a 24 credit portfolio development course (PDC) the design of which is in itself developmental in nature. It introduces the learner to experiential learning, the design and assessment of the programme and supports the learner in the compilation of a RPL portfolio. The PDC is compulsory and offered face-to-face only. The online students attend these lectures on the campus of the University of the Free State.

Programme design includes peer group support as an important condition for success in adult learning. Learners are introduced to opportunities to develop skills and competencies necessary for teamwork throughout the programme.

Learners are expected to produce a final "major piece of work" before graduating. In this way learners are afforded the opportunity to demonstrate the integration of the competencies gained throughout the programme. To ensure the successful presentation of this final project, each learner is supported by an academic expert as well as a mentor chosen from the business community or from his/her work environment. Throughout the programme, an academic advisor is available to the learners for support in academic issues as well as personal development. The academic advisor is a registered psychologist.

Entry requirements

Prospective learners should be at least 23 years old with relevant working experience. They need to have a grade 12-certificate with at least two years working experience or a grade 10-certificate with at least 5 years working experience. These are *necessary* conditions, however, they are *not sufficient for entry* into the degree program. In addition to these, potential learners must go through an evaluation and selection process (Portfolio Development Series) to demonstrate their readiness for university level studies. Only once the learner has met the learning outcomes of the first five modules, all the conditions for entry will have been met.

Recognition of prior learning

Prospective learners wishing to apply for the BML may gain credit for and exemption from certain modules in the curriculum based on the successful completion of previous and relevant training courses, learning from life and work experience as well as independent study.

A trained review committee consisting of the Director of the School, academic experts and programme administrators, assess the student's portfolio for credit. Prior learning is measured against a set of international and national principles and standards. The expected and recommended duration of study for part-time learners is four years. However, this period may be shorter if a learner obtains credits for sufficient prior learning and skills demonstrated.

Curriculum design

To successfully complete the program, a learner has to demonstrate his/her learning via module specific learning outcomes. These include capabilities relating to module knowledge and the understanding thereof within a management leadership context. In addition, capabilities relating to integrated knowledge and skills from a variety of disciplines within the management leadership field. Being modularized, the program, addresses specific study in the fields of management, leadership and the environment.

Credit bearing modules are divided into three domains: environment, management and leadership. From the second phase in the program learners have the choice to follow the program in the private or public sector. Their choice is based on what best suits their own *personal* managerial environment.

The curriculum design is such that learners can exit the program at different levels. In the event of a student seeking to exit the programme she/he leaves with academic recognition.

Either she/he obtains an accredited Certificate, Diploma, or on completion of the required amount of academic credits a Bachelor degree in Management Leadership.

The following model illustrates the integrated nature of the programme.

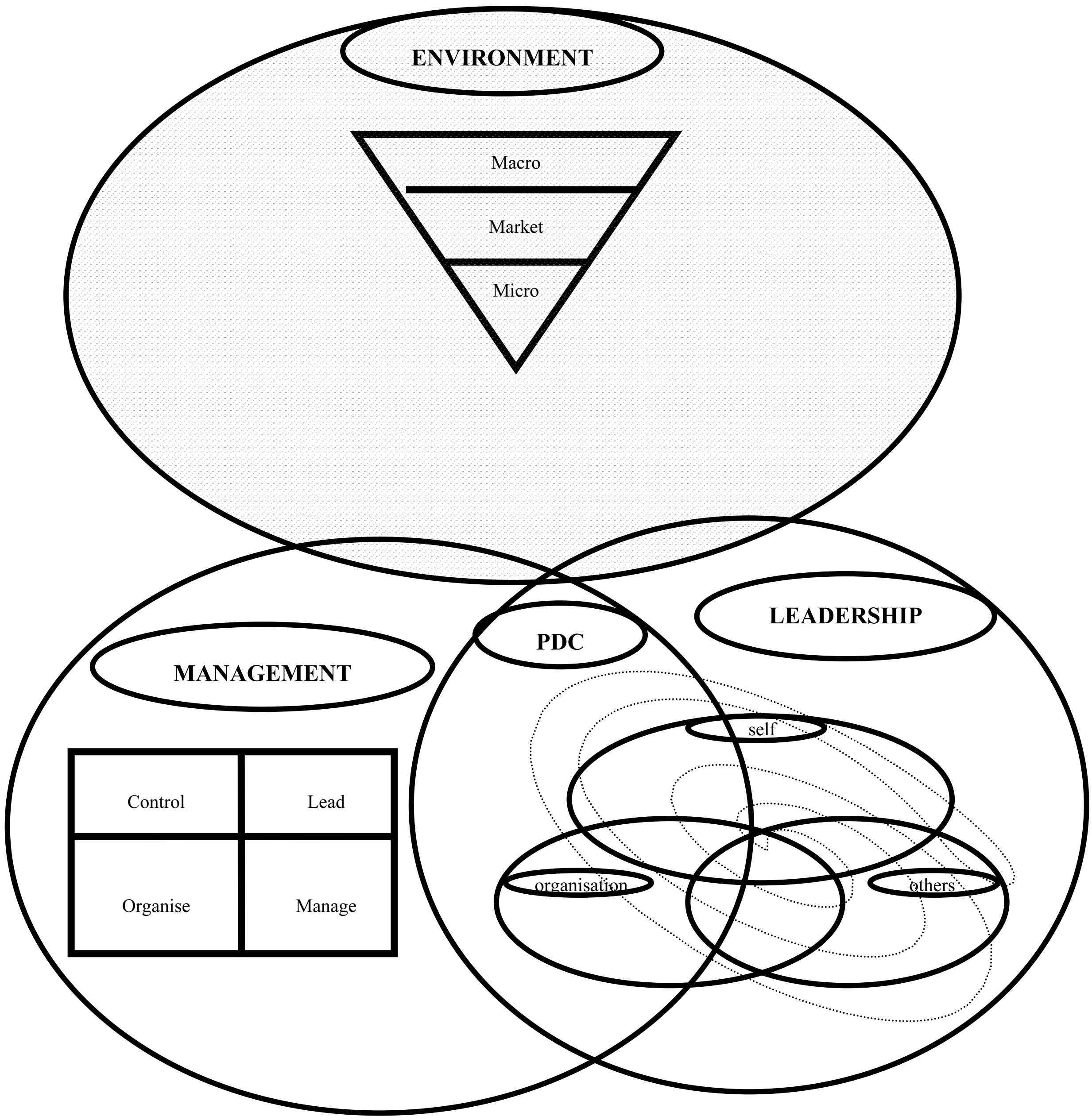

Figure 1. Bachelor in management leadership

On completion of BML a learner should know and be able to demonstrate the following:

- Correctly use management leadership, terminology, definitions and classification.
- Communicate effectively using appropriate language and media.
- Observe, accurately record and account for management leadership features in the field.
- Competently handle the instrumentation and data manipulation relevant to the management leadership field.
- Synthesize and critically evaluate management leadership information.

- Demonstrate and understand the techniques and strategies involved in analytical (academic) enquiry and problem solving.
- Describe and account for the cultural processes, which influence the evolution of management leadership contexts.
- Prepare illustrative and interpretative analytical reports.
- Understand the role of the managerial leader in society with regard to human and economic development.

Conclusion

The program has been running successfully as part of the programs offered at the School of Management at the UFS. The BML graduates are taking up their positions in the public and private sectors with acclamation. The BML program is a life changing experience for people who have never had the opportunity to complete or further their studies after school. Not only does it develop the learner academically it also equips a human being with self-confidence and a stand in society. According to feedback from stakeholders of the program, obtaining the BML not only certifies adult workers' experience with fundamental theoretical knowledge, but also, due to the nature of the programme, assists them towards a better understanding of themselves, their position and their responsibilities in the workplace.

Some comments from learners who have completed the Bachelor in Management Leadership successfully speak for themselves:

> "This was the opportunity I have been waiting for."
>
> "Both the content and presentation of the learning material addressed my needs as an adult learner."
>
> "Due to the recognition of my prior learning I completed the BML in two years."
>
> "The BML was a life changing journey."

Listening to the anxiety and uncertainty in the voice of an adult learner entering a lecture hall for the first time in his/her life and observing the same adult learner doing his/her final presentation at the end of the program; listening to him/her convincing, speaking with confidence and demonstrating self esteem, should convince any person that this kind of program at higher education institutions has been long overdue.

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TECHNOLOGY, LEARNER PASSIVITY AND MEDIATED LEARNING EXPERIENCES

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Like cohabiting species, face to face work and on-line tuition complement each other in complex ways. We have not yet begun to explore their ecology (Blake 2000: 196)

Introduction

Embedded in the assumptions of the promoters of technology-mediated learning is a range of possibilities, offers and unlimited potential with very limited measure of the limitations and constraints, even when financially these appear obvious. The worst scenario seems very often to follow the logic "here is the solution, what is the problem?" Where an enabling policy environment exists and effort towards sound planning is undertaken, which is the case of South Africa, technology-mediated learning initiatives still reflect a number of shortcomings: (i) too much emphasis placed on ICT and not education; (ii) little investment in (contextually relevant) content suitable for this medium; (iii) shortage of professional development and other training on the use and integration of ICT into learning and teaching; and (iii) lack of adequate research. In addition many projects are rolled out on a small scale without the design to evolve into bigger projects, thus making limited impact and showing no significant systemic impact. While considerable efforts have been made to address some of these problems and lessons have been drawn, the question of learner passivity in on-line programmes remains a major puzzle.

In this paper, we explore the question of 'learner passivity' in the context of e-learning with reference to experiences drawn from three main case studies, namely the *Mindset Network Initiative* and the *Department of Telematic Learning and Education Innovation* (TLEI) and the Multimedia Group at the University of Cape Town. By e-learning we refer to learning mediated by technologies such as the Internet, computer-based multimedia, and the World Wide Web. Research suggests 'learner passivity' as the single most important factor accounting for both the long time it takes for individuals to complete online courses as well as for the high drop out rates found amongst people who enroll for online courses. Current attempts to address this problem have failed in two interesting ways: (i) the failure to recognize the converging nature of the modes of delivery where e-learning interfaces with other delivery modes; (ii) the failure to locate ICTs in the context of teaching and learning; (iii) the failure to develop a suitable learning theory which takes into account the nature and specificity of this particular mode of delivery; and (iv) contextual complexities of the learning environment, the learning styles and the diversity of the learners they cater for. In other words, the lack of suitable epistemological and pedagogical strategies grounded in sound learning theories is certainly behind the problems facing the future of e-learning in South African higher education. Our intention is to argue that any effective pedagogical practice in the e-learning domain should be informed by a learning theory that seriously takes into account these aspects. We then suggest pointers for an approach to e-learning that incorporates socially interactive opportunities with concentrated mediated learning experiences as a means of enhancing '*learner activity*', retention and throughput in online courses.

Background

Mindset Network develops and delivers on a mass scale educational material through appropriate media (satellite, video, web and print) to the primary and secondary school community, health community and vocation and enterprise community. TLEI offers higher degree courses on-line. One of its most important projects is the Tele Tuks Schools project, a community outreach initiative established in 1994 to improve Grade 12 pass rates in disadvantaged communities. The Multimedia Group assists academics in integrating e-learning in course delivery. We consider three key dimensions concerning these projects: (i) system arrangements; (ii) programme design and delivery strategies; and (iii) professional development aspects. Of importance to our analysis of these dimensions is Daniel's claim that the best response to the opportunities presented by technology and the most effective answer to the threats posed by current trends lies in the distinction between hard technologies ("bits and bytes, electrons and pixels, satellite and search engines") and soft technologies ("processes, approaches, sets of rules and modes or organization"). As he puts it, we must concentrate on "getting the soft technologies right" (Daniel 1999: 12; and Morrow & Nonyongo 2003: 12). We locate these in the context of teaching and learning with sensitive appreciation of contextual peculiarities and historical legacies to argue that behind current uncertainties concerning learner passivity lies the absence of suitable learning theories and relevant curriculum and pedagogical practices. This particular aspect should be interpreted with reference to the changing nature of teaching, which is no longer the activity of "transferring content" – ICTs play a huge role in the transfer of information and knowledge – learning facilitation follows a learning-centred education paradigm.

Towards a Learning Theory in E-learning Practice: Interaction through Mediation

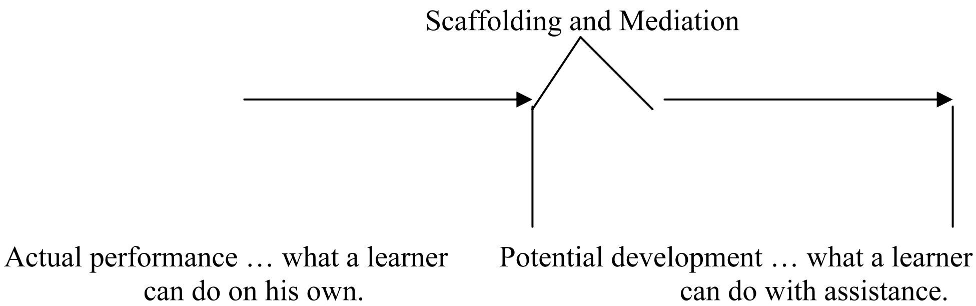
The advent of "tutors and students without faces and places", to borrow from Blake, has highlighted the importance of interaction in on-line tuition as teachers and educators, unable to access or uncover the identities and learning styles of their learners on the other end of the network, increasingly find it difficult to deal with the question of "learner passivity". From an ecosystemic perspective, there may be many factors, internal or external, resulting in learner passivity towards learning through the medium of distance education or ICT's. How do we deal with learner passivity? What does interaction mean in e-learning programmes? Is interaction beyond technological interactivity possible in on-line education? How do we promote learner participation or facilitate interaction in e-learning programmes? Under what conditions? For the purposes of this paper however we want to explore the role that mediation, or the lack thereof, has to play in minimizing passivity, promoting interaction and 'access for success' in e-learning and other multimedia forms of distance education provision.

'Learner passivity' (also referred to as "lack of interaction" or "low learner participation") is an extremely interesting term. On one hand, when used as an adjective, 'passivity' implies that learners are non active in the learning process; they are inert and bear no interest in the learning process. From this perspective, responsibility for failure to complete a course or the course requirements for certification lies directly with the 'learner'. On the other hand, when the term 'passivity' is viewed as a verb, 'learner passivity' can be interpreted as active resistance to engaging with course material in an online form. Learning interaction is thus an active participation in the learning process or engagement of the learner in doing something which leads to cognitive development. In this sense, interaction does not only involve expression of one's own ideas but also comprehension of those of others. As Rivers (1988: 4) puts it, "Participants work out interpretations of these meanings through interaction, which is also understood in a context, physical or experiential with nonverbal cues adding aspects of meaning beyond verbal".

A distinction should be made between *interactivity* and learning interaction which can assume three main forms: learner-content, learner-learner and learner-teacher. The learner-content interaction has been referred to as "structured silence", a strategy that allows learners to intra-act or reflect and process in silence while engaged with content (Barker 1995: 8). Interactivity is the technological capability of establishing connectivity in real time; it is an attribute of the technological system used in learning mediation rather than an attribute of instruction (Evans 2004: 42). As Evans (2004: 153) has indicated the term "interactive television has misrepresented the potential of the medium since it implies that interaction is an inherent characteristic of the medium and thus ensures presenter-viewer interaction." Whether in "interactive television" or in e-learning, we are already beyond the early mystification of technology with plenty of evidence. Clarke (1983) articulates the idea that it is the method and not the medium that influences the quality of what we learn (or teach). This idea is endorsed by Barker who reiterates that the key success factor of distance learning is not the medium but the teacher and well designed instruction. For him no technology can overcome poor teaching. In the contrary technology can exacerbate poor teaching.

Developmental theories of education suggest that for a learner, regardless of age, to become an autonomous, innovative, industrious and independent purposeful participant in the learning process, motivation and support through the form of mediation needs to be provided. According to Vygotsky (1962, 1978) individuals learn, and are motivated to learn, through engagement in constructing shared meanings through *social interactions* in *particular social contexts*. Vygotsky argues that cognitive development and meaningful learning occurs most readily in social interactions which provide a platform for mediation to take place. Vygotsky also argues that *meanings cannot be separated from their social context*. He believed that meanings are social constructs, built up and passed on *in the interaction between people*. He places emphasis on social interaction, as he strongly believes that people do not exist in a vacuum. They exist in social contexts, all of which have broader historical and cultural "meanings" (values, information, ways of understanding, interacting), as well as more specific and local "meanings". While some meanings are common across different social contexts, others are more specific to particular contexts (Donald *et al.,* 1997).

Enter the *Zone of Proximal Development*! Vygotsky maintained that every learner has a zone of proximal development – which represents the difference between what learners can do on their own and what they are capable of doing with the assistance of others.



With regard to scaffolding of learning activities, Vygotsky suggests that learners are motivated to learn when they are provided with learning experiences through which they can discover their own answers to context specific and relevant questions. He further argues that motivation to learn is inherently linked to the link between the 'goodness of fit' between the way material is designed to accommodate the learning styles of different individuals and how it is structured to challenge a learner and demonstrate new ways of thinking in order to raise levels of individual understanding without alienating or overwhelming a learner. Academic achievement brought about through scaffolded learning opportunities, social interaction and mediated learning experiences not only promote *conceptual development* but also enhance an individual's *motivation* and *task orientation* (the way in which a learner approaches learning tasks with persistence) towards the course he/she has undertaken to study.

Reuven Feuerstein (1991: i-ii), a student of Piaget, professor of psychology and researcher in the field of learning development believes that there are two modalities of learning. One of these is *a direct approach* based on Piaget's formula of *S-O-R* (Stimulus-Organism-Response) where learning comes about as incidental in the interaction between an individual learner and the surrounding world. Another modality is *mediated approach* which develops Piaget's formula of *S-O-R* to a formula for mediated learning *S-H-O-H-R,* where *H* is the human mediator. Within mediated learning, the human mediator interposes him/herself between the learning organism and the world of stimuli to interpret, guide and give meaning to the stimuli through intentional interaction.

Feuerstien believes that learners need exposure to both direct and mediated learning for optimal learning to take place. In his own words, Feuerstein claims that "the relationship between mediated learning experiences (MLE) and direct exposure modality of learning can be formulated as follows;

the more a learner is afforded MLE and the more optimal the mediational process, the greater the capacity of the learner to benefit and become modified by direct exposure to stimuli" (Feuerstein, 1980 in Cognitive Research Programme: Mediated Learning Experience Working Manual, 1991: ii). According to Feuerstein, all learners need to be afforded assisted opportunities to develop and build accurate and meaningful concepts and mental constructs of the visual and abstract elements of the world around as presented through the medium of teaching. Feuerstein has identified ten criteria or parameters of interaction believed to be fundamental in mediation which include:

- *Intentionality and Reciprocity* which involves the establishment of an interpersonal relationship promoting mutual interaction;
- *Meaning,* including the use of process questioning where educators guide learners towards developing concepts for themselves;
- *Transcendence,* also known as bridging which involves linking what the learner already knows to new and unfamiliar situations, experiences and knowledge;
- *Competence,* instilling in the mediatee a positive belief in his ability to succeed;
- *Self-regulation and Control of Behaviour,* a criteria that involves encouraging the learner to think about their own thinking and adapting their responses suitably;
- *Sharing,* promoting sensitivity towards others and an emphasis on working together;
- *Individuation,* the acknowledgement and appreciation of uniqueness and independence;
- *Goal Planning,* the process whereby the mediatee is guided to set, plan and achieve goals;
- *Novelty and Challenge,* promoting feelings of excitement and determination when confronting new and difficult tasks;
- *Self-change,* developing the recognition, acceptance and monitoring of continual changes that occur within oneself (Cognitive Research Programme: Illustrating Feuerstein's Instrumental Enrichment Programme, 1993: 58).

How do we explore the possibilities that these criteria or parameters of interaction offer in the design and delivery of an e-learning strategy? In our view, they cannot be of any significant use if they are not considered within a coherent and integrated learning strategy. Neither can they have any mediation impact if the contextual peculiarities of the learning environment and characteristics beneficiaries of the learning experiences are not considered. In other words, "integration" and "contextualization" become central in the transformation of the above theory to fit a particular contexts and learning styles. This is a fundamental importance if we consider the emerging trends in current learning delivery models.

Converging Learning Delivery Modes: How Unique is E-learning?

We argue in this paper that the success of current on-line or technology-mediated programmes will increasingly depend on their ability to coherently integrate various learning resources, including face-to-face and other forms of "contact", into a flexible pattern which enables effective learning. Since its inception distance learning and open learning has depended on various proportions on strategies based on face-to-face and other forms of learner support, including print material, tutorials, and on-site teachers. As Blake (2000: 196) puts it: "Like cohabiting species, face-to-face work and on-line tuition complement each other in complex ways." We pursue this argument with a sensitive appreciation of our historical context and due consideration of the digital divide which threatens poorer countries more than others with the danger of leading these to what Castells has referred to as "decomposing societies", or countries that have sunk to the point of no return and with no prospects of narrowing the digital divide. There are three main dimensions to the South African context worth mentioning. First, the use of ICTs in education occurs in the context of convergence of modes of delivery, i.e. within a context where the traditional distinction between "contact" and "distance" modes of delivery is no longer applicable or has at least assumed a new meaning. Awareness is growing that "elements of distance education have almost always existed in face-to-face programmes, while educators involved in distance education are increasingly recognizing the importance of different types of face-to-face education as structured elements of their programmes”, which renders “rigid distinctions between the two forms of delivery meaningless”.

Second, research into Mediated Learning Experience in South Africa (Skuy and Mentis, 1992: 107-108) has shown that education has to a large degree been limited to direct learning experiences and that culturally diverse populations in this country have been denied the basic cognitive skills of transmission needed to adapt to their own and other environments. In addition, research has found that the South African education system has provided inadequate development of the prerequisites for thinking and thinking skills which has resulted in a reduction of children and adult’s capacity to learn from new experiences. According to Skuy and Mentis (1992) such findings are due largely to a historical educational emphasis on child compliance and passive recall of information rather than application of knowledge or analytical and creative problem solving in South African education. Compliance and passivity assume an alarming form in South African education given the legacy of Fundamental Pedagogics that placed emphasis on obedience and conformity through an extremely authoritarian pedagogical practice.

While new educational policies have been passed over the past few years which promote an out-comes based system of education that encourages application of knowledge and analytical and creative problem solving, many of the educators expected to implement these educational changes while facing themselves cognitive deficiencies caused by a lack of optimal learning experiences in their own formal education and pre-service training. Such a situation implies that while there is a need for mediation in assisting learners who are studying through a multimedia medium, programme developers may not be in a position to provide the necessary mediatory techniques necessary for developing and utilizing intentionality and reciprocity, meaning and transcendence. This in term impacts directly on the way learners approach e-learning.

Briefly, mediated learning experiences have a role to play in online learning and would certainly offer learning experiences that minimize learner passivity and promote active participation and learning interaction. As we have highlighted, the work of Vygotsky and Feuerstein pose serious challenges to the traditional educational forms of information transmission, replicated in e-learning practices, at the expense of the strategies that provide learners with opportunities to enrich their cognitive, emotional and motivational functioning. Isolated, self-directed traditional format of e-learning places learners ‘at risk’ if they are presented without opportunities for social interaction and concentrated mediated learning experiences framed in relation to their specific social context.

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EXPERIENCES WITH INTRODUCTION AND RUNNING OF AN E-LEARNING SYSTEM

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Summary

The present paper is the closing chapter of a tripartite series of conference-lectures by the authors on the planning [1], testing [2] and final introducing of an e-learning system. In this paper the authors give an overview of their own experiences with introduction of a widely used e-learning system. Check points of this development are identified in this paper in aiming to guide followers to avoid time-consuming and expensive loops in this development process. Especially it is outlined, how the transfer was carried out from simple HTML publication to running of a complex learning content management system. Further development projects are detailed as well.

1. Introduction: state of art

Dennis Gabor College (GDF) founded in 1992 is the biggest higher education institution in Hungary in respect of number of enrolled students, dealing with distance learning. The number of students varies between 20 thousands and 30 thousands heads in a calendar year. For the present date the number of new students seems to be stabilized, approximately annual 2000-2500 heads. Organization of such mass of students, professors, hardware and software facilities requires a centrally managed content and administration system, a perfectly adapted structure and an almost military type discipline.

1.1 History of education technology development at GDF

During the past decade there was a tremendous upwind in the field of education technology. These changes are clearly reflected in the technology used by GDF. See the main stages of this development below:

- 1992: paper support and video cassette
- 1996: more and more documentation in electronic format distributed on diskette
- 1998: full range web support on Internet
- 2000: electronic documentation distributed on CD
- 2001: multimedia CDs
- 2002: early challenges in E-learning
- 2003: experimental E-learning (120 students), professional learning administration system
- 2004: full speed running of E-learning system (2400 students)

Today we consider that all of the above steps were necessary to arrive to our current level, but whoever wants to follow our example, he or she must carefully examine the only last two phases in our development history.

2. Focused on electronic learning technologies

When we say electronic learning technology, the basic and unavoidable technology is the publication on the web in HTML format. Today no higher education institution can roll without a correct home page. This homepage, even in case when it is highly informative, can not be the source of contents to learn. However in the last decade of the 20th century, home pages of universities were filled with learning content, in aiming to distribute the content between the largest possible student populations. Today we know well that e-learning technologies give much more help to learner than the simple text documentation in passive form. The minimum service is the structured document with intelligent research engine. Universities must decide: whether continue publishing learning content with minimum requirements or develop all-functional e-learning content and publish it for a reserved community. Those who want to take part in the distance learning business must choose the second option.

In electronic content development one can use much more sophisticated tools than in traditional paper-background document edition. Audio, video and animation files can be inserted also. In the last decade of the 20th century, when the internet penetration was less important than today, and the high speed file transfer was less available, the natural information support was the CD. On a CD, 650 MB directly accessible information can be stored. The content of the CD can be structured; consequently the intelligent research is available. The intellectual part of the development work is very similar to that of an e-learning content. The two important disadvantages are: easy copying, and the limited volume.

3. From the decision to the realization (2002-2003)

Once an institution is entered into content development and distribution on CD, only a very small step remains to enter into a real e-learning system. If a Learning Administration System is joined with a Content Management System, it can result in use of real e-learning system. As use of LAS is a basic requirement in case of running any higher educations establishment in our country and we already have had some electronic content, the decision was evident: unify these two elements and introduce a real e-learning technology.

3.1. Development of methodology

First of all it is necessary to identify which topics are intended to be taught. The character of topics determines the technical tools to be used, which influences the applied methodology. As we are an IT school, we decided to use the full range of available technology components so our future LMS should deal with all possible elements such as audio and video files, animation and interactive components. We decided to create forums and chat-corners for our students. On the basis of these technical entities we developed a methodology guide in which we determined how to use these elements. This methodology guide was not only a methodology support but a technical support as well. Today, after a month test period and after four month of full speed running, we are convinced that this early methodology guide shall be subject of upgrading.

3.2. Selection of a Learning Content Management System

When selecting the LMS, our basic requirements which can be suggested to anyone who follows us were as below:

1. Capability to deal with all above detailed technical components.
2. Easy and efficient data exchange with our existing LAS.
3. Conformity with major international standards in field of e-learning (SCORM, LRN).
4. Easy content development tools.
5. High reliability low coasts.

Analysing the market of LCMS systems it can be easily concluded that:

Ad 1: All available products can deal with the listed technology components.

Ad 2: No experience in field of data exchange with our existing LAS, consequently a development process is required in aiming to create this data exchange.

Ad 3: All available systems were in conformity with international standards.

Ad 4: How easy is using of a development tool, finally one can decide only by using of it. According to supplier promise all product are easy to use.

Ad 5: All supplier states that the reliability of their product is high, however measured reliability data were never published. The coast are subject of agreement, they may vary between wide ranges.

Consequently there were no significant differences in respect of points 1-4, point 5 shall be subject of detailed analysis. The total cost is the sum of investment costs and operation overheads. In respect of investment cost we may chose a free of charge option, which is the case of open source LCMS system such as ILIAS. In this case no technical support is available, except specialised forums on the internet, and the responsibility of technical development is the responsibility of the user.

When selecting the product of a well known supplier, one have to invest a considerable capital, but a permanent technical support is provided. In this case the reliability of the system will be certainly higher, than in case of open source software.

Finally we decided to invest in renting of the LCMS of a well known software supplier, which provided guarantees for the technical support, the data exchange between the LAS and the LCMS, and participation in development of a tool adapted to capacities of our staff. The rent agreement was concluded on annual basis.

3.3. Experimental e-learning education

We decided to develop four topics in aiming to test our methodology, the LCMS, and the topics themselves also. The content development needed about nine month, than in some three months we loaded our LCMS and we run a test period of about one month with 120 enrolled students. The test period was closed by an examination with the same condition as that of the students participating in normal courses. An overall success rate of 66% was obtained.

3.4. Evaluation of results

A detailed statistical analysis of result of this test period was published in our paper [2]. The main conclusion of this test in respect of methodology was that the chat-corner is unnecessary for the students and it is very difficult to realize for our teaching personnel. Instead of chat corner the use of forums shall be straightened.

The second important conclusion was that our personnel are capable to deal with technical problems of the selected LCMS and so probably they could also provide a high reliability service with an open source LCMS.

4. Running in full regime (2004)

See the results of the test period; we decided to run a full speed regime starting from October 2004, for all of our first-year students. In this respect about five new topics were necessary to elaborate.

4.1. Replacement of the LCMS

Based on financial and operating-security reasons we decided to use an open source LCMS, namely ILIAS 2.6. Now we benefitted from the fact that all of our previous topics were elaborated according to international standards, as the majority of our source documents were prepared in MS Word. We used a translation engine to load the same topics under the ILIAS system. In respect of introduction of the new ILIAS system we had to solve the problems as follows:

- Creation of an operating team with respect of high reliability.
- Install the new LCMS on our server.
- Solve the data exchange between our LAS and LCMS.
- Adapting the ILIAS system to Hungarian language.
- Load the topics under ILIAS.
- Run the system in 24/24 hours.

In fact we created two servers: one for the test and a second for the real running. Topics were tested first on the test server. If the net all quality requirements, they were uploaded under the real running system.

4.2. Modifications on the methodology requirements

Without changing the main goals of our methodology guide, further requirements were taken into consideration, namely how to transform existing paper-support contents to “semi” e-learning contents. It is based on the structuring of documents. A very strict structural transformation was defined for all of our authors with some obligatory components such as self-test, intelligent research in the document. Our concept was that the majority of authors are developing the content in MS Word, using the template which assures the conformity with international standards. Flash animations, video records in AVI format and audio records in WAVE format are welcome. Self-tests shall be elaborated in MS Excel, using XML format. Not all the components are necessary but there are some obligatory elements:

- Structured text in HTML format with internal and external linking.
- Self-test in XML format.
- Meta data characterising the topic (description of the topic, students guidelines).

4.3. Running the system

All topics of the first semester of 2004/2005 academic year were uploaded in September 2004. During the inscriptions the students were informed on the availability of our e-learning system. All of our 2400 first-year students were entitled to enter in the LCMS. In this moment this system is a parallel one, that is to say we provide traditional courses as well, the students may use the LCMS optionally. However a considerable part of students are actively participating in the electronic way of learning. About 10% of the unscripted students are regular user of the LCMS. There is a follow up system incorporated in the ILIAS, by means of which all enter in the system can be recorded and statistic can be made on the users’ habitudes. So in this stage of the full speed run it can be concluded that:

- All enrolled students had visited the site at least once.
- 10% of the enrolled students are regular user of the site.

The percentage of regular users seems to be low. But one has to take into consideration, that in this stage of development we don’t have the courage to use electronic learning technology exclusively. Even our case is not a typical “blended” learning, as students have the choice to decide if they want to follow their studies in a traditional way, in electronic way or in combining of the two methods. It is expected, that when the traditional way of courses will be withdrawn in certain local centres, the number of regular users will increase considerably.

5. Further development projects

We have decided to upload all of our topics (some 200) under the LCMS. The timing of upload process corresponds to timing of traditional courses, that is to say all topics of a semester shall be uploaded before starting the semester. We want to provide all topics for students who started their studies in 2004 October. That is to say, topics of the first semester of the second year will be uploaded before 2005 September and so on. In this phase we accept the simple adopting of paper-support content to e-learning content; however development of original e-learning content is welcomed. Due to the fact that in IT the depredation time is very short it is expected that in case of half of the topics the content development will be recommenced at the end of the four years period.

We suggest that the content development will be carried out by our own personnel, by means of:

- MS Word template sheet (80% of cases).
- MS FrontPage (10% of cases).
- ILIAS incorporated development tool (10% of cases).

Even in case when MS Word is used as development tool, we prefer to create original e-learning content, in full conformity of methodology requirements, with full palette of available components. We hope that the shortly transformed paper-support contents will disappear more and more.

5.1. Permanent quality control

In respect of system operation important data can be drawn from the USER TRACKING facility of the system. By means of user tracking the operators may display all operations carried out in any segment of the system. From pedagogical point of view the number of users in time intervals can be very interesting. The total number of entering was 4575 between the 26th of October and 10th of December. The table below gives distribution of entered users in one hour time segments. The maximum number of users (nearly 1500) was detected in the time segment 14:00-15:00 and 15:00-16:00. However it is interesting to state that there is a student activity between 00:00-01:00 AM.

It should be noted that during the 9 days of Christmas break, only 900 user entering was recorded. Unfortunately a breakdown of three days happened during the analysed period, due to a hardware failure.

Table 1: User tracking – Distribution of users entering in one hour time segments

Time interval

Number of users

Felhasználói nyomkövetés

Idő	Számlálás	
0:00:00 ~ 1:00:00	100	
1:00:00 ~ 2:00:00	43	
2:00:00 ~ 3:00:00	14	
3:00:00 ~ 4:00:00	35	
4:00:00 ~ 5:00:00	2	
5:00:00 ~ 6:00:00	9	
6:00:00 ~ 7:00:00	81	
7:00:00 ~ 8:00:00	38	
8:00:00 ~ 9:00:00	690	
9:00:00 ~ 10:00:00	867	
10:00:00 ~ 11:00:00	738	
11:00:00 ~ 12:00:00	798	
12:00:00 ~ 13:00:00	509	
13:00:00 ~ 14:00:00	562	
14:00:00 ~ 15:00:00	1462	
15:00:00 ~ 16:00:00	1471	
16:00:00 ~ 17:00:00	1177	
17:00:00 ~ 18:00:00	963	
18:00:00 ~ 19:00:00	475	
19:00:00 ~ 20:00:00	595	
20:00:00 ~ 21:00:00	357	
21:00:00 ~ 22:00:00	385	
22:00:00 ~ 23:00:00	199	
23:00:00 ~ 24:00:00	234	

(Tétel 1 - 24 of 24)

An online students-feedback sheet is annexed to each topic. The evaluation sheet is elaborated by an independent expert company having good experience in mathematical statistics. The evaluation of students' opinion is permanent. It is carried out when the current semester is closed. On the basis of the students' feedback conclusions are drawn in respect of quality of content and quality of tutoring too. The necessary modifications are done immediately.

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LIFELONG LEARNING AND DISTANCE EDUCATION AT THE COLLEGE OF FINANCE AND ACCOUNTING OF THE BUDAPEST BUSINESS SCHOOL

Eva Sándor-Kriszt, Tamás Radványi, Budapest Business School, Hungary

The background

Hungary cannot take pride in universities as old as those of Bologna, Paris, Oxford, Montpellier, Prague, Cambridge, Krakow, Salamanca, or Vienna. The first Hungarian university was founded by Louis the Great, king of Hungary, in 1367 in the southern city of Pécs. Unfortunately, however, in the early 15th century this old university was closed down owing to the vicissitudes of history. The following date in the history of Hungarian universities is 1635, when Peter Pázmány founded the Jesuit University in the present city of Trnava, which at that time belonged to Hungary and was called Nagyszombat. In 1770 the university was transferred to Buda, and, after the Second World War, it changed its name from Pázmány Péter University to Eötvös Loránd University. Now it is the largest institute of higher education in Hungary, competing with the university of Pécs for seniority.

Hungarian higher education (and the educational system in general) followed the example of the German (Prussian) system: centralised control (i.e. dependence on government regulations), a rather rigid structure, highly specialised schools (e.g. there used to be a *secondary* school for *viticulture*), and the "dual system" of Institutions of Higher Education, i.e. the strict separation of colleges (Fachhochschule) and universities. The latter meant that college graduates had practically no possibility of continuing their studies at universities.

In 1989, the year before the dramatic political changes, there were over 20 universities and approx. 29 colleges in Hungary. They were all run by the government, though, it must be admitted, they had significant autonomy in academic matters. After 1990, the distinction between state-run IHEs and IHEs run by churches and foundations became much more marked. It also became apparent that IHEs were far too numerous and overspecialised (e.g. there was a University of Horticulture). The need for a drastic overhaul of the system of higher education was inevitable. The process of modernisation, however, took quite a long time for several reasons, which include the reluctance of the successive governments to tackle a highly sensitive problem, the resistance of the IHEs to introduce radical changes, the shortage of funds, the lack of knowledge, expertise and determination, etc. The pressure on the government was growing: the scarcity of government funds compelled the authorities to think more seriously.

Ultimately something had to be done, and that happened at the beginning of the year 2000. An Act on Higher Education ruled that there shall be 18 universities and 13 colleges in Hungary as from 1st January 2000. Tactfully, the government let IHEs decide how they would regroup themselves. Surprisingly, all went down fairly smoothly. Our college (the College of Finance and Accountancy) decided to merge with two colleges also engaged in business studies: the College of Commerce, Catering and Tourism and the College of International Management and Business Studies. Though not everyone was happy with the merger – and there are still problems to overcome – the decision proved to be wise. The result is that we have become the fourth largest IHE in Hungary and the largest college (regarding enrolment).

The present

There was an important conclusion that we had to draw from visiting Western IHEs: our methods of teaching (or – more professionally speaking – our methodology of knowledge transfer) were slightly antiquated, although there is no consensus on that point. Some academics still think that good old methods are superior to modern ones. New methods, they argue, only serve the purpose of mass-education, which is a bad thing in itself. Economising on education is a waste of our biggest asset: knowledge. The reduction of contact hours with the students, they say, will only impair the students' performance and the result will inevitably be lower standards of knowledge. And they point a finger at some American universities with poor output.

It would take too long to discuss or counter all these arguments. We think that in our circle conventional wisdom has it that it's useless to ponder who is superior: we can mutually learn quite a lot from each other. At least we are sure that adopting new methods (we are using the word *method* in its broadest meaning) is at least as important as introducing structural changes. And right now we are faced with both problems: introducing structural changes and adopting new methods and technologies.

The structural changes are connected with the Bologna process, and we are sure that each participant knows what it involves. A new law on higher education is to be adopted within a few months by Hungarian Parliament. It will introduce the system of the three degrees (Bachelor's, Master's and Doctorate), eliminate the dual system (making it possible for the students with a Bachelor's degree to continue their studies towards a Master's, and for those with a Master's towards a Doctor's), and it will reform the governance of IHEs so that external bodies – the "users" of university graduates – could have a greater say in the financial management of the schools (though this remains a bone of contention between academics and government authorities). Anyway, there is a flurry of activity in both circles, with lots of meetings, discussions, disputes, and newspaper articles. But, in the end, disputes will be settled and animosities will subside.

A problem lingering perhaps much longer will be the modernisation of instruction in higher education. This involves both the contents and the methods of the materials taught, i.e. methods in a broad sense. We will dwell on that a little later.

Another task higher education is faced with is providing services to new target groups – adults who need further training or re-training. This is not an entirely new mission of higher education: evening classes, correspondence programmes, and special courses have been offered by universities and colleges for a long time. What is new in this respect is a growing demand for these services, which means the extension of the programmes, and the need to apply new channels of transmitting knowledge, in other words, to introduce new methods.

Distance education in the College of Finance and Accountancy

The College of Finance and Accountancy has had programmes of adult education for decades. The need for the knowledge that our school spreads is par excellence meant for people on the jobs faced with new challenges. Almost right at the beginning, we had evening courses for part-time students (twice or three times a week) with a slightly simplified curriculum giving the graduates the same degree as full-time students were receiving(!). Then we had correspondence courses for students who lived and worked far from the college and their possibilities of coming to school were limited to coming once a week (on Saturdays). They were also offered the same degree as full-time or evening-course graduates. And, of course, we offered a large variety of special short courses which did not lead to a degree.

More or less the same was true of our sister institute, the College of Commerce, Catering and Tourism. Actually it was there that a Distance Learning programme was launched in 1996. The College of Finance and Accountancy soon followed and started a programme in 1997, first very cautiously with a small number of students. We had the advantage of having been granted Phare funds to study the Distance Education programmes of other countries, to write new materials, to adapt materials to satisfy the needs of Distance Education, and to finance other related expenses. The programme was a success, the number of students increased each year, and soon the small office of Distance Learning was operating in full swing. (In parenthesis, let us mention here that perhaps the biggest difficulty we encountered sometimes was explaining to some of our colleagues the difference between teaching full-time students and tutoring distance-learning students.) But all that is ancient history now.

Now Distance Learning is an integral part of training in the College of Finance and Accountancy. So much so that without it the College would be in serious financial difficulties. Our school is a state-school, but the government does not cover all the expenses of running the school – subsidies unfortunately tend to decrease rather then increase – and so we (and other state-owned schools) are compelled to look for other sources. Distance Learning programmes, even if you cannot call them lucrative, help the school to survive.

We have 1400 students, 95 tutors, and an administrative staff of 7 full-time colleagues and about twice and many colleagues help with the administration of the Distance Learning programme. Students can come twice a week – Friday afternoon and Saturday morning – for consultations. At the beginning of each semester they receive the materials (requirements of the modules, books, notes, worksheets, etc.). They are supposed to hand in two assignments for each module they are taking, and at the end of the semester they have to take the exams. They can keep in touch with the Distance Learning Centre and the tutors via the internet (or by telephone).

In another development, the College of Finance and Accountancy has established cooperation with the Université Paris X (Nanterre). Using the curriculum of the French university makes it possible for the College to issue joint diplomas.

Recent developments

We are aware of the deficiencies of our system. Administration and organisation should be improved. With the increased number of students problems of logistics have arisen and sometimes we have had difficult days. (For example, we have had long queues waiting for books to be distributed.) There have even been complaints that had to be handled very carefully. Methods should be upgraded by offering more training to tutors, and there should be more mobility of staff and more exchanges of experience. The materials also need to be reviewed and updated from time to time. In business studies it is crucial to offer students material that they find useful and can be applied in their everyday work. Some of the books can be used for quite a few years, in other cases updating is an absolute necessity.

But at present we are concerned with moving some of our materials onto the internet so that students can have access to them electronically. Fortunately, we have received a grant to work on that. We have done the bulk of the work, but still there are a lot of details that must be finalised before the materials can be put at the students' disposal. The job is quite impressive if you consider that it involves 25 modules, designed for a programme to be offered primarily to Small and Medium-sized Enterprises, but which could also be used for other purposes. It is worth mentioning that this project is being carried out in conjunction with the two other colleges of the Budapest Business School.

Another recent development at the BBS is the establishment of a Life-Long Learning Centre. The idea was born when it became apparent that the need for adult education was increasing, and the government, as well as other organisations, were willing to support this kind of training. The major task of the Centre is to coordinate adult education in the three colleges of the BBS. The advantages of the merger of the colleges become obvious if we think of the possibility of pooling resources, both material and human.

Since the new Law on Higher Education is likely to permit colleges to launch Master's programmes (if they meet the requirements), it is a necessity for our school to start work on possible Master's programmes. We are aware of the fact that it wouldn't be possible for any one of the colleges constituting the BBS to launch such a programme, it seems to be natural that these should be organised by the newly established Life-Long Learning Centre.

One of the projects already in operation is a franchise agreement with Anglia Polytechnic University (Cambridge), which makes it possible for Hungarian students to pursue their studies in Budapest with the help of Hungarian tutors but using APU materials. The Master's degree is granted to successful students by APU.

Plans for the future

These are the most important issues that we have to address in the near future:

- We will have to modernise our Distance Learning Programme. In particular by
  - reorganising administration;
  - updating teaching materials;
  - offering training to tutors;
  - introducing on-line materials.
- The on-line modules of the SME programme
  - will have to be finalised;
  - launched (made accessible for enrolled students).
- The Life-long Learning Centre of the BBS will have to
  - launch short-term courses pooling human resources of the three colleges;
  - continue the existing Master's programme(s) run jointly with APU (Cambridge);
  - find new possibilities for launching Master's programmes.

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THE PROFILE OF E-LEARNING ACTIVITY AT WARSAW SCHOOL OF ECONOMICS

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Abstract

The paper will present some examples of the activities carried out by the Centre for Development of Distance and Permanent Education at Warsaw School of Economics. Various forms of activity on the local, regional and international levels will be described.

Introduction

Warsaw School of Economics started its e-learning activity in 2001 by the promotion of online lectures prepared by individual university teachers. The aim of that action was to encourage the staff to use the ICT, especially Internet, in everyday teaching practice. Following the proved popularity of online education, the Centre for Development of Distance and Permanent Education was created in 2003. Its purpose is to ensure well organized and structured support for introducing e-learning into traditional education at the university. In order to fulfill that task an e-learning platform was built, strictly adjusted to the university needs. The system is being systematically developed and the international standards, including SCORM, have been implemented just recently.

Fulfilling the needs of the university

The former supportive activity of a Centre has been expanded in recent years. Not only the full-studies are supplied but the platform is also used for organizing the online lectures for MBA and PhD students. The main form of activity however became a programme for complementing the extramural studies. In the Polish tertiary education system there are two parallel forms of university studies. A student can get his/her Master or Bachelor degree by attending either regular lectures and classes or in an equivalent form called extramural studies. Those students meet only at the weekend sessions twice a month at least. Consequently the total amount of lectures and classes they attend does not exceed 80% of those offered in regular form, which means more students' individual work is required. In order to help those people to fill the gap it was decided to introduce e-learning technologies and to offer some lectures in an online form. Such a solution gives the students more support from the academic staff, which means they are not left alone with their studies, but at the same time it does not imply more frequent presence at the university campus (which is often an obstacle for working students). To achieve such a goal a Programme of General Complementing of Extramural Studies was elaborated. The first step of the Programme started this academic year. It is foreseen that the whole curriculum will be supplied by more than 2500 lecture hours on the whole, but for each individual student it will be about 1700 hours of online lectures and classes. Preparation of online materials has been divided into three main parts:

The first one – started last year – deals with all basic obligatory subjects. The second step applies to all other university subjects already taught. The teachers who want to take part in the project can work individually or in groups. They can always get necessary help from the Centre staff. Both technical advice and didactical or methodical support are offered to them. It is worth to be mentioned that university standards concerning various aspects of preparing the learning materials as well as lecturing and tutoring online have been prepared.

The final step implies introduction of about 30 new fully online courses. The students will be obliged to choose two of them each term starting from the fourth to tenth, which means they will have to complete 14 online courses by the end of their studies. This process has been divided into two steps – in the first of them 20 subjects will be offered, and the second step should allow to extend the choice to 30 courses. The first step started in January 2005. In consequence a competition for university teachers has been organised – 20 topics have been chosen and are being prepared – we expect that in October all these courses will be available for students. The role of the Centre is not only to coordinate the whole Programme, but also to offer versatile help to all who are going to prepare online materials. Apart from the typical help desk activity there are also regular monthly seminars organised, in which we try to familiarise the university community with various aspects of e-learning.

The Centre is also carrying out research on e-learning activities. At the stage of free chosen courses the general attitude towards e-learning and its tools was tested (by the questionnaire posted on the platform). The analysis of the collected answers has shown that students in majority accept such form of teaching, they find the platform user friendly and the materials published on it quite useful and interesting. With regard to teachers' approach – it has to be spotted that this group of users is less enthusiastic about such form of education, the teachers often do not make use of the tools the platform offers to them and the reason is that most probably they do not know both the tools and the didactic aspects of this form of teaching. This assumption has led to the decision of organizing monthly seminars mentioned above. When the regular obligatory courses will be introduced the next step of research will be carried out – we plan to collect the data concerning the effectiveness and quality of e-education offered by the university platform e-sgh.

The Centre organises also other trainings, which expand staff qualifications. One of them is a course for managerial qualifications dedicated to the university units' managers. The program of training contains interaction skills, time management and negotiations.

Other forms of local activity are the foreign language lessons for the academic staff. Since year 2003/2004 all the teachers can attend an English course 'Brush your English'. It is also planned to introduce a similar course in German.

Country wide activity

The Centre does not limit its e-learning activity only to the university students and teachers. We want to expand our e-education offer to SME staff and, possibly, to unemployed people. That is why we are going to start collaboration with local authorities in order to support their training actions by the use of e-sgh.pl platform.

Although online education in Poland applies mainly to tertiary education we cannot forget about secondary school students. In order to make them familiar with e-learning tools it is planned to organise an online competition for them. According to the university profile (economics) a subject of the competition will be entrepreneur knowledge.

Among the recent initiatives there is also collaboration between five schools of economics in Poland. Its main purpose is to share experience in ICT use in order to improve the quality and effectiveness of teaching process. It is planned to organise common online courses for the students from all the schools involved in the project as well as sharing the learning materials. Especially the last initiative already mentioned can lead to significant savings in time and money. It is quite clear though, that similar subjects, especially at the beginning of studies, are taught at different schools. Sharing the materials prepared by other universities can help to get several ready-to-use courses in the short period of time.

One of the most important actions, that have been undertaken in order to promote e-learning at the university is an e-magazine issued every two months since October 2003. At the beginning addressed to the teachers of Warsaw School of Economics, systematically becomes more and more popular and at present it reaches more than 300 educational institutions all over the country. The magazine printed in 1200 hard copies is also available online at the URL: http://www.e-mentor.edu.pl. The current statistics show, that the site was visited by over 80 000 people (February 2005). It has five units:

e-education, e-business, knowledge management, lifelong learning as well as teaching methods, forms and programs. The growing popularity of the magazine is proven not only by the number of people and institutions subscribing to it, but also by the range of authors and articles sent to the editorial board for every issue. Our ambition is to present possibly wide spectrum of problems and solutions in the indicated subjects and that is why we try to promote our magazine all over the world and to encourage the authors from other countries to publish in it. All the necessary information can be found at the address given above.

International actions and projects

Up to now the Centre does not have much experience in international cooperation. We intend to apply this year for EU founded projects but at this stage we can only express our hope that at least some of them will succeed. In the meanwhile we started a bilateral cooperation between Warsaw School of Economics and University of Illinois at Springfield. The first step of our common work will be a joint online class for Polish and American students. The subject taught will be: the 'Business Philosophy and Ethics', the criteria of completing the course, the transfer points and the types of certificate have been agreed. At present (February 2005) the syllabus is being prepared; in the further steps the teaching materials will be elaborated. The class starts in October this year. If succeeded, this pilot course will be repeated as a regular offer for students from both universities.

Research and projects

Apart from the projects mentioned above and linked to various forms of collaboration the Centre is carrying out its own research projects. They are oriented on the quality measure of the courses offered on e-sgh – university e-learning platform. They have started in autumn last year, which means that we were able to collect the introductory level data only, namely the answers to the questionnaire concerning the general attitude of the teachers and the students involved in online education. Accompanying the introduction of a General Programme of Complementing Extramural (in the next academic year) there will also bring the possibility to measure the effectiveness and usefulness of regular online courses and to compare the results of that form of education with the traditional one.

Final remarks

E-learning in Poland is still in its development phase. One of the biggest obstacles is the lack of necessary law regulations, especially defining the status of online studies and certificates. Such situation delays the process of introducing the online studies into the tertiary education offer. Despite these unfavourable conditions several universities, including Warsaw School of Economics have introduced various forms of e-learning into their educational offer. Some of them are independent and adjusted to the university profile, whereas some others are aimed at the broaden community. The Centre for Development of Distance and Permanent Education at Warsaw School of Economics develops its e-learning activities systematically and is willing to compare its experience with the educators from the other universities and countries.

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E-LEARNING AND DEVELOPMENT COOPERATION: THE SPANISH EXPERIENCE WITHIN WORLD BANK PROJECT (GDLN), FOSTERING INSTITUTIONAL STRENGTHENING

Ricardo Cospedal, CEDDET Foundation, Spain

Introduction

CEDDET (Centro de Educación a Distancia para el Desarrollo Económico y Tecnológico – Distance Learning Centre for Economic and Technologic Development) is a World Bank and the Spanish Ministry of Economy and Finance joint project initiated 3 years ago.

The Centre is a Foundation where the public and private sector are represented in the Board (Spanish Development Cooperation Agency, Spanish External Trade Institute, Spanish Ministry of Economy and Finance, the World Bank, Telefónica Foundation[1], Universia[2] and EFE Agency[3]).

The objective of the Foundation is to share knowledge through the use of ICTs. CEDDET provides online courses for public institutions with the aim of contributing to their institutional strengthening.

The online courses are complemented with video conferences and presence visits to Spain where personnel links and networking is heavily promoted.

The Foundation is the Spanish branch associated to a World Bank world wide programme named Global Development Learning Network (www.gdln.org). CEDDET is inserted in the Latin American and Caribbean network and its activities are specially addressed to that region. The whole WB network gathers more than 70 countries in the world.

We share this *basic principle*: "Funding is not enough for development. Knowledge is also needed".

Our specific objective is sharing, especially with Latin American Countries, the know-how and experiences gathered by the Spanish Public Administration, learning centres and private companies, through ICTs in order to promote institutional strengthening and to foster the economic and social development of our countries. We do also seek to ameliorate the investment environment as a tool for economic development.

Technological option

- CEDDET teaching methodology is mainly based on Internet (on line education).
- The methodology is devised to run with the Basic Telephone Network, not needing high band width neither ADSL nor ISDN, etc.
- There is not need for very advanced software or hardware equipment.
- CEDDET does not have its own e-learning platform we use the Telefónica Foundation's platform, offered for free to the project.
- Occasionally, CEDDET uses videoconferencing for certain kind of seminars and short-term round tables ("Global Dialogues") or as a supporting tool for on line courses (sometimes, one or two videoconferences in each course).

[1] Telefónica is the former Spanish public phone operator and nowadays a private company

[2] Universia is an Internet Portal gathering 800 Latin American and Spanish universities and the Santander Bank (www.universia.net)

[3] EFE Agency is the Spanish public news agency with extensive presence in Latin America

- For videoconferencing transmission, CEDDET uses WB Network in Latin America, and the Telefónica Foundation facilities in Spain.

CEDDET's teaching methodology

- Online teaching methodology is based on virtual classroom concept and characterized by experts personal and systematic attention to the participants along the course (training intensive in teacher, not in computer or software).
- Selective trainingship: limited number of participants (approx. 25 per course, max 30).
- Tutors must have not only theoretical knowledge but mainly professional and practical experience.
- Contents must address concrete management problems.
- Relatively long term courses: between 4 and 14 weeks.
- Intensive training: 2-3-hours per day.
- Strict quality system.
- Optional complementary program: stays in Spain, from one week to ten days with an academic and practical content as well as visits to the Institutions or Companies providing the content of the course.

CEDDET in numbers

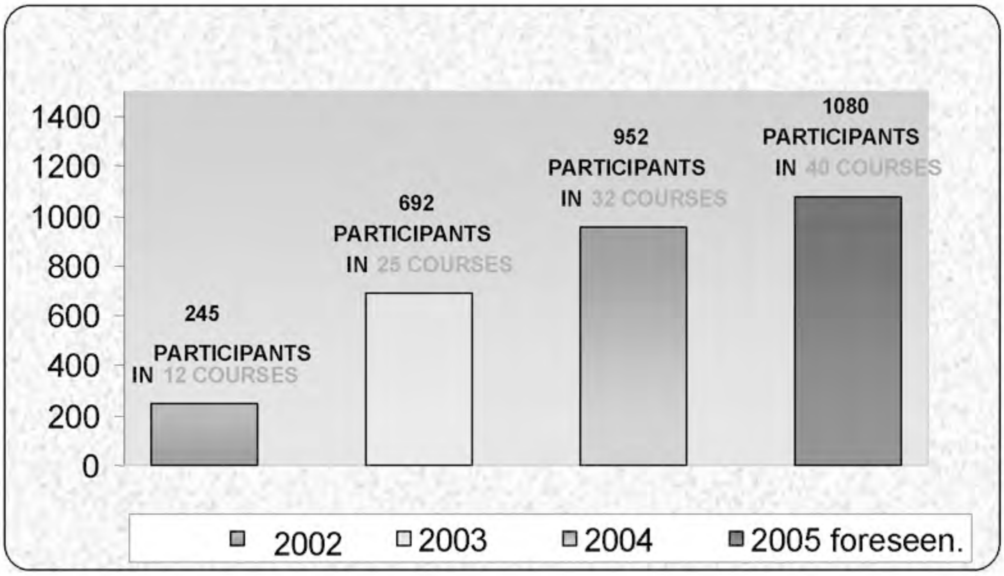

Figure 1. CEDDET statistics

In three years we had 1.889 participants in 69 online courses related to the following topics:

- Public administration: HHRR, Quality, Communication, Decentralization, Local Government Economic Management;
- Tax and public revenues, Cadastre, Statistics;
- Regulated markets: Property rights, Telecommunication, Stock Market, Energy;
- Environment and Tourism: EIA, Cultural Heritage Tourism Management;
- Economic development: Trade and Investment Promotion, SMEs, E-Business;
- Social Security.

These contents are chosen in order to provide:

- Practical knowledge based in the experience of Spanish and Latin American Public Administration, Judicial Authorities, companies and learning centres.

- Knowledge which is usually not in the training market (nor presence neither online).
- Especially relevant for State consolidation and for the creation of an appropriate climate for national and foreign investment.
- Interesting for Latin American countries thanks to its immediate application to concrete problems.

Average age of participants is 40 years. Therefore, we are addressing medium to high officials in directive or pre-directive positions within their organisations.

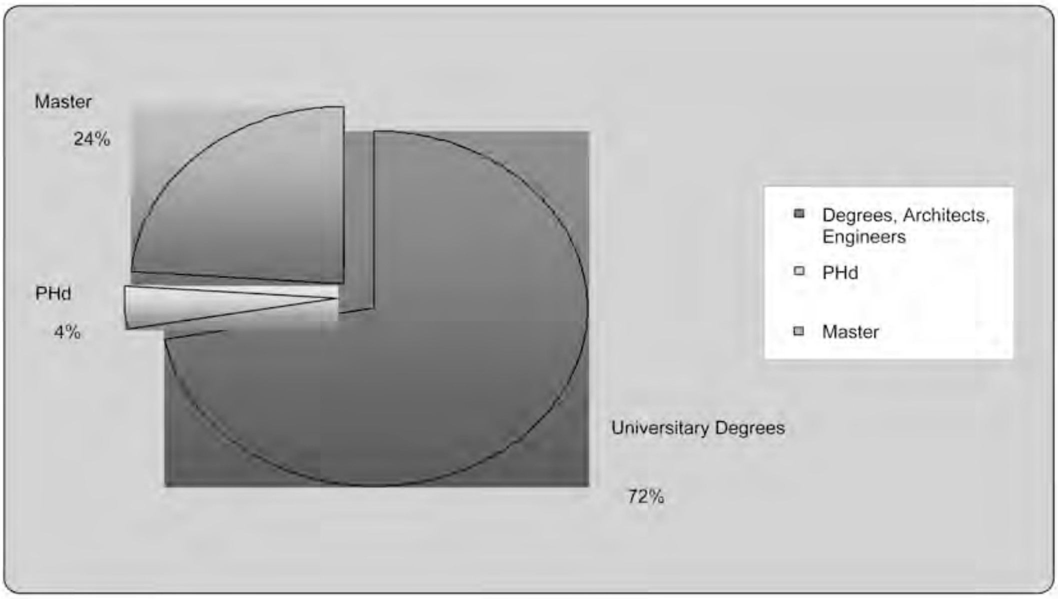

Figure 2. Academic Background

CEDDET main results

We have developed an extensive network among civil servants specialised in different topics that keep their links once the programmes are finished.

We have contributed to introduce e-learning in the public administration (Spanish and Latin American) and to promote its use for curriculum development and training purposes.

CEDDET is now facing the creation and development of experts networks based on internet that offer services to ex-alumni such as specialised courses, fora, news letters, document centres, etc.

CEDDET participates in e-learning initiatives and working groups in Spain regarding new tools and methodologies.

Conclusions

We have proved that the psychologic and technological barrier was inexistent for this kind of activities in Latin America and that the contacts that may be developed are at least as strong as the live contacts provide in presence seminars.

We are convinced that ICTs are a strong tool to incorporate to the development cooperation schemes where real experience sharing is possible. ICTs allows communication and sharing experience in a very affordable costs.

CEDDET is a public and private joint effort to use ICTs that have faced the same problems than other similar projects regarding:

- Property rights;
- data privacy;
- fund raising;
- institutional relations;
- procedures;
- regional focussed courses vs country focussed approach;
- technological limitations in several countries;
- network development;
- training of trainers;
- international collaboration in the courses implementation, etc.

However, in general terms, the results achieved so far have contributed to commit funds and to drive efforts with the aim of developing real networks among experts that share practical experiences that are useful in every country.

The main idea relies on the basic concept that everybody may learn from others' experiences and the participation of 25-30 experts of at least 6-7 countries per course enrich the perspective of managing daily problems in the public administration.

The experts that keep in touch, after the course is finished, propose new activities that are undertaken by themselves or with the Spanish collaboration. The significant effort that the participants need to unfold during two to three months, create a climate of collaboration that remains in the mid time and became a powerful tool to promote new initiatives.

On the other hand the institutions that propose the participation of their experts do also recognise the value and huge potential to belong to an informal network that may contribute to address practical issues. They may compare their experience with other countries in the region or beyond the Atlantic that are now undertaken similar policies or have already applied them few years ago. Success and fails are openly shared without the formal constraints of an institutional forum where critics are usually avoided. An online training course is a friendly manner to provoke a real exchange of views while the training component is never forgotten.

The participants therefore became trainers and trainees at the same time and participate through a bottom-up approach in a collaborative process that encourage changing of policies. They feel confident to propose reforms in their countries based in the empiric experiences of other colleagues.

CEDDET have made a significant effort to carry out the training programmes following the mainstream of the WB and the Spanish Cooperation as well as the Latin American countries strategies for training officials. These programmes became a complement of more comprehensive development cooperation strategies undertaken by bigger institutions, while CEDDET serves as a tool to contribute to the exchange of experiences and networking.

The Foundation is an initiative that finds its rationale in the political option to promote knowledge and networks as a mean to foster institutional strengthening and therefore social and economic development.

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THE DISTANCE FORM OF EDUCATION USED IN LIFELONG EDUCATIONAL PROJECTS AT THE FIM, UHK

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Abstract

The Institute of Further Education was established at the Faculty of Informatics and Management in 1998. Its purpose is to organize complementary activities of the faculty. Over the last six years of its existence it has organized more than 160 courses with almost 5000 participants interested in further education. Since the very beginning the Institute has been taking an active part in creating programmes (e-learning courses) that use information and communication technologies for distribution study materials and for communication among participants.

1. Introduction

Under the influence of demand for lifelong (further) education which is constantly increasing, a new institution dealing with this problem was established at the Faculty of Informatics and Management (FIM), University of Hradec Kralove (UHK).

Since 1998 The Institute of Further Education (IFE) has been working at the faculty. It aims at organizing educational programmes in this field which are run out of the framework of accredited university study programmes. Its activities are of two types:

- organizing complementary activities;
- activities in the framework of the FIM and UHK projects [1].

2. Lifelong Educational Programmes

The complementary activities, i.e. courses of further education, are of the following categories:

- Courses aimed at preparation for studying at university – preparatory courses in mathematics, English, German, courses for tourism & management.
- Extra courses for university students either interested in studying other foreign languages (e.g. Spanish) or supportive ones in mathematics and languages for students with lower entrance level of knowledge necessary for successfully passing exams.
  - Courses and trainings for organizations, usually in the field of computer literacy, foreign languages, ECDL testing but also of managerial skills, economics etc.

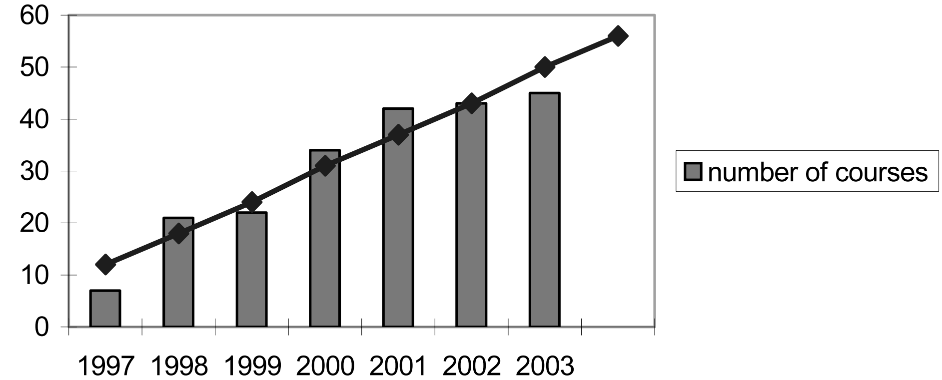

Figure 1. Numbers of lifelong education courses in 1997-2003

The IFE also deals with distance education. Since 1998 it has been preparing distance lifelong education courses, especially for civil servants and teachers of basic and secondary schools. Four distance e-learning courses have been prepared – The Internet in Education, Modern Presentation and Education, ECDL a 'P training' under the SIPVZ, which have been organized several times.

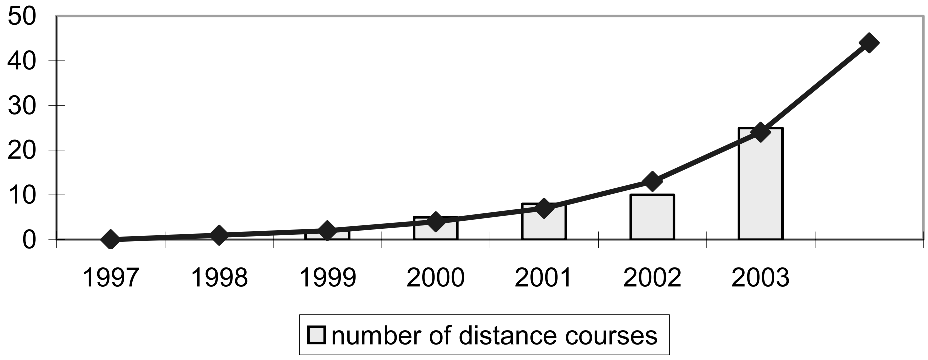

Figure 2. Numbers of distance e-courses in lifelong education

The number of participants interested in both lifelong education courses and distance e-learning courses is growing steadily.

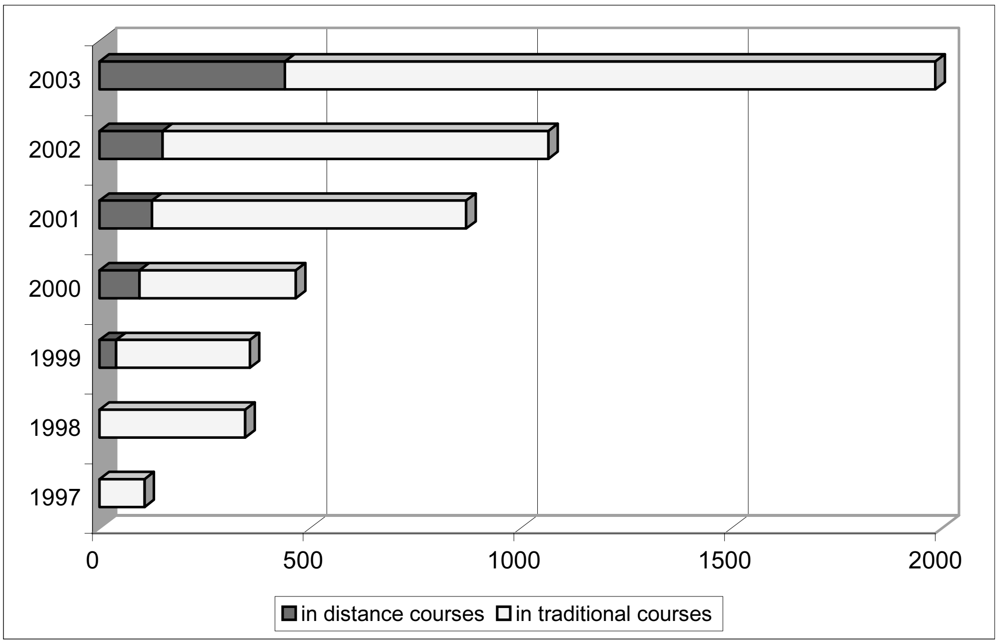

Figure 3. Numbers of lifelong education participants

3. The Effectiveness of Distance E-courses

As both the traditional present and distance courses are organized by IFE, the comparison of effectiveness could be drawn.

Preparatory courses for ECDL testing are run in present and distance form. The number of passed tests became the rate of effectiveness of both forms.

In the distance form of the preparatory course for ECDL testing participants receive study materials in printed form at the beginning of the course. The virtual learning environment is used for communication with the tutor and other participants, it means for managing the course, feedback and motivating participants. Before the testing a three-hour tutorial is organized once a month, when students have the possibility to clear some problems and practise a test similar to the real one.

The IFE has organized seven distance e-learning preparatory courses for ECDL testing and four present ones.

Table 1: Distance preparatory courses for ECDL testing

	Number of participants	Number of modules	Number of tests planned	Number of tests passed	Number of passed tests in %
course 1	66	7	462	389	84,2
course 2	11	7	77	71	92,2
course 3	7	7	49	27	55,1
course 4	28	7	196	118	60,2
course 5	10	6	60	44	73,3
course 6	12	7	84	80	95,2
course 7	7	3	21	21	100
Total	141		949	750	**79,0**

The present courses took 120 lessons, resp. 80 hours (preparation for 5 of 7 tests).

Table 2: Present preparatory courses for ECDL testing

	Number of participants	Number of modules	Number of tests planned	Number of tests passed	Number of tests passed in %
course 1	5	7	35	26	74,3
course 2	15	5	75	53	70,7
course 3	15	5	75	56	74,7
course 4	15	7	105	102	97,1
Total	50		290	237	**81,2**

From the above presented numbers we can see that students in the present form of studies were slightly more successful. Having analyzed participant's situation in both groups in general we can say that present form students have lower level of entrance knowledge, worse possibility to use ICT and are less motivated. The distance form students are highly motivated busy people interested in further lifelong education.

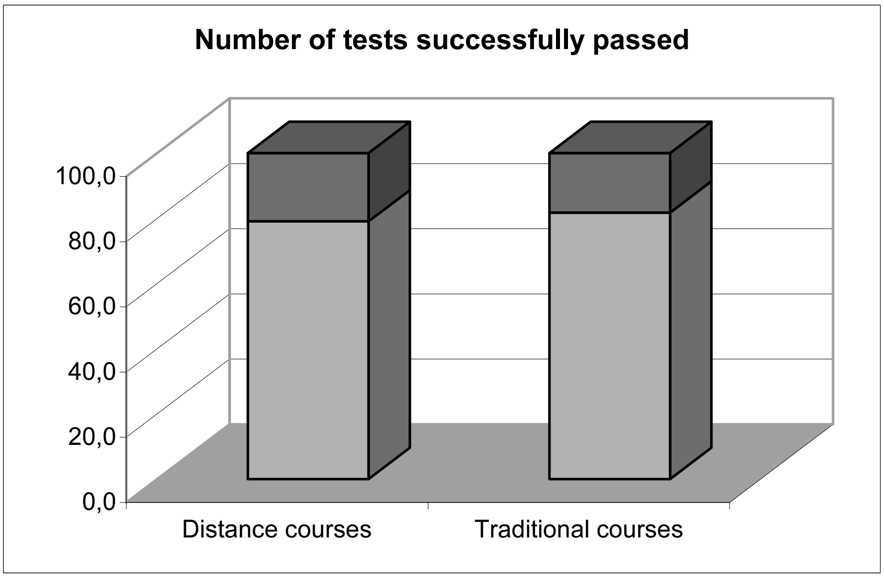

Figure 4. Efficiency

4. Return of Investments

Input costs for creating a distance course are high which can be displayed on the example of preparatory distance courses for ECDL testing.

Before the first course there were following costs for:

- Preparation of distance study materials in the virtual learning environment (200 000 Kč) and their printing (200 000 Kč/500 copies);
- The designing e-course costs were 20 000 Kč;
- Payments for virtual learning environment licenses for students (about 100 Kč/1 student);
- Costs for running the course for each group of 20 students include tutor's salary (23 250 Kč) and administrator's salary (5 000 Kč), taxes on wages (10 000 Kč), material costs (2 000 Kč), renting costs for tutorial rooms (10 500 Kč), overhead costs and VAT (11 000 Kč).

Input costs for traditional courses do not include any amount for designing the course but for its tutor (30 000 Kč for each 120 lessons/20 students) and e-course administrator (3 000 Kč), taxes on wages (11 500 Kč), material costs (5 000 Kč), renting costs for classrooms (60 000Kč), overhead costs and VAT (28 000 Kč).

Table 3: Total costs are displayed in the table 3.

Number of participants	Distance course	Present course
20	483 750 Kč	137 500 Kč
40	547 500 Kč	275 000 Kč
60	611 250 Kč	412 500 Kč
80	675 000 Kč	550 000 Kč
100	738 750 Kč	687 500 Kč
120	802 500 Kč	825 000 Kč
140	866 250 Kč	962 500 Kč
160	930 000 Kč	1 100 000 Kč
180	993 750 Kč	1 237 500 Kč
200	1 057 500 Kč	1 375 000 Kč

As you can see it is less expensive to organize the distance preparetory course for ECDL testing for more than 115 participants.

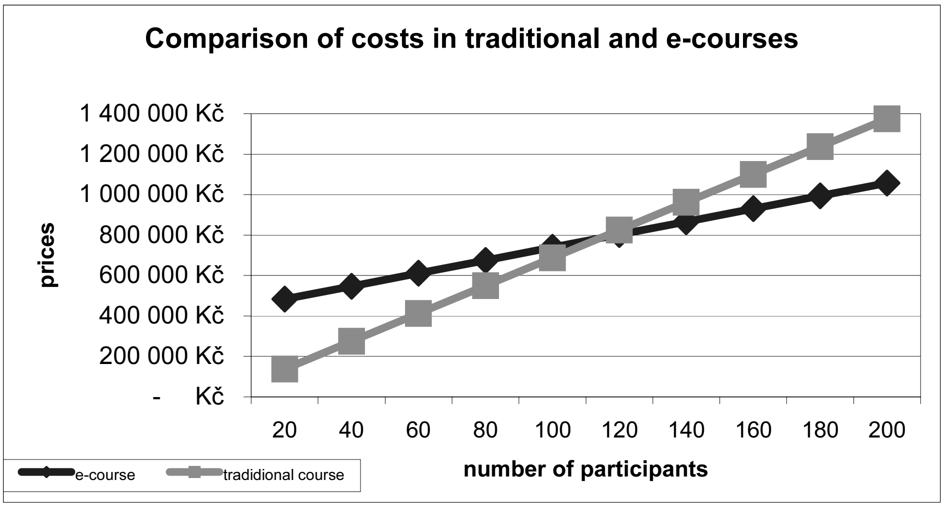

Figure 5. Comparison of costs

5. Interest in Distance Form of Lifelong Education

From the above introduced data it is obvious that the interest in distance courses in increasing. Nowadays both firms and employees prefer this way of education because there is no necessity to be absent during working hours and possibility of studying at their own pace. In spite of higher input costs the distance education is more suitable for participants with different entrance knowledge which is often seen especially in the field of ICT which the IFE specializes in.

6. Conclusion

Our experience in the field of lifelong education is rich for the past years. Despite this it is difficult to prefer any of the educational form. They both have advantages and disadvantages which have been described in numerous articles. The distance form does rank among other ones in the field of further education and participants often prefer it. But there is a group of less motivated people without possibility to use ICT. The traditional form of education is more suitable for them.

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STUDY COMPETENCES REQUIRED TO PURSUE LIFELONG LEARNING

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Introduction and backgrounds

Flexible learning, which may include e-learning and distance education, requires study competences and skills, from both teachers and students, which are not normally used, developed or encouraged in traditional education. A constructivistic approach to learning raise questions about what kind of tools, strategies, techniques and attitudes a successful e-learner will need. Knowledge on how to structure information, evaluation skills when it comes to own activity and science results, information technology, communication theory and information literacy are some significant areas to work with. These competences do not just emerge but have to be learnt and it involves hard work.

This paper gives a description of how Sandviken, a rather small community in the north of Sweden, that has taken on the challenge to prepare their students for lifelong learning. We have taken a closer look on why we consider information literacy be so important in the perspective of lifelong learning.

The dynamic struggle

Andy Hargreaves' book *Changing Teachers, Changing Times: Teacher's Work and Culture in the Postmodern Age* describes a radical and dynamic struggle between two huge powers in society: The Modern Age vs. the Postmodern Age. This struggle creates patterns of change in school of today.

The Postmodern Age vs. The Modern Age

The Postmodern Age is distinguished by an increased speed in changes and an intense compression of time and space, multitude cultures, complexity in technology, national uncertainty and scientific insecurity. Against this we have a modernistic school system that continues to work within impenetrable and very little flexible structures.

The Modern Age basically rests in the belief of the Enlightenment that nature can be transformed and that you can achieve social progress through a systematic development of science and technology and rationally apply these insights in economic and social life. The Modern Age has created the conditions, which above all secondary and upper secondary schools and their teachers have developed and worked within: time controlled lessons, age divided classes, subject based curricula, written examinations – everything that today constitute "real" education in these schools and is actually specific sociohistorical product.

The post-modern calls for more flexibility, better readiness for changes, faster pace in changes and more decentralized governing and has made school react in above all two ways.

Reactions

The first reaction has been to wake up and strengthen the tottering structure of the Modern Age by defending the borders of the institutes, emphasize the traditional school subjects, standardize education strategies and written examinations.

The second has been to hide in protected collectives where you together try to fulfil mutual visions of a better school. A nostalgic searching for small collectives of co-operation and consensus where you ignore the intolerance that you can find.

A beginning

Even if you accept the changes in a post-modern society and try to create a school in its spirit, it isn't the end of the problems of school. If you are looking for comfort in a false cocksureness you have to search in other places. Instead it's a beginning, a chance to create new rules for new purposes and a new kind of learning in a new time. The opportunities to behave and take part in the shaping of the post-modern world are still wide open. And according to the post-modern paradigm there's not only one model that is the correct one, no simple truth. The most important task ought to be to identify, map and describe a spectrum of models for learning.

Certain things are obvious: when scientific knowledge gets the character of something temporary more and more learning based on given knowledge and indisputable facts will become less credible. Examination processes, analyses, information collection and other aspects of metacognition in an engaged and critical way will be more important goals and methods for school in the Postmodern Age.

Flexible learning and information literacy

One way is that school carefully examines the possibilities for flexible learning where information literacy is one of the qualities of knowledge. This is one of our alternatives.

The rules of the world are changing. It's important that rules of education and learning also change concurrently with the new world.

Three dimensions of learning[1]

The future learning will focus on three dimensions:

- *The lifelong learning*
  Where you assume that individual learning
  You are is responsible for your own
  care of your inclination to learn. You are
  individual learning styles and are
  new learning. environments.
- *The life-wide learning*
  Where learning is part of new structures. Here the
  lifelong learning is realized through tearing down
  impediments – e.g. between educational institutions and the
  working life.
- *The ethical aspects of lifelong learning* (the depth of the lifelong learning)
  Values as a foundation linked to our common values about democracy, human dignity etc. When all the possibilities of modern technique are put into use, the technique itself will be questioned in relation to the ethical values.

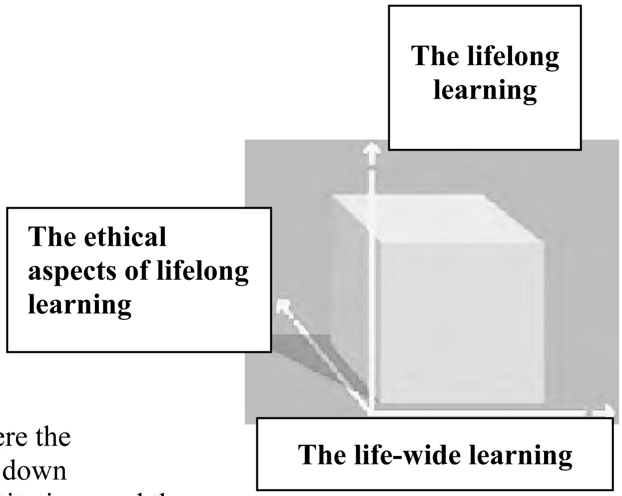

Figure 1.

In order to be able to manage the lifelong learning process the individual needs a variety of competences and, as stressed out before, they do not just emerge. Also, they are not present in traditional learning institutions and a change of attitude and direction, from instructional teaching to constructional learning, throughout the educational systems, is necessary to support the process.

ICT-projects in Sandvikens Kommun

In Sandvikens Kommun since 1994 two overarching school development projects, Knowledge Support in Education 1.0 and 2.0, have been aiming to change attitudes towards the commission and include ICT in everyday use. This is in accordance with the national curriculum that came into use in

[1] Figure 1 courtesy of the Knowledge Foundation of Sweden.
http://www.kks.se

1994 (LPO94). Part of the commission is to prepare our students for lifelong learning, which of course includes the use of ICT, also to benefit from in everyday work today.

Knowledge Support in Education (KiU)

In the project KiU 1.0 (1994-1999) the commitment was the teacher's in-service-training in order to implement computers as a pedagogical tool. The second project, KiU 2.0 (2001-2005), is based on experiences made during KiU1.0 and makes use of conclusions made by Luleå University of Technology, evaluators of KiU1.0. Therefore KiU2.0 are aiming at the principal's role as a pedagogical leader with support from ICT-tools. They work with nine target areas in six project groups consisting of principals, assistant principals and development staff from Sandvikens school departments pedagogical ICT-Resource.

Part projects and target areas

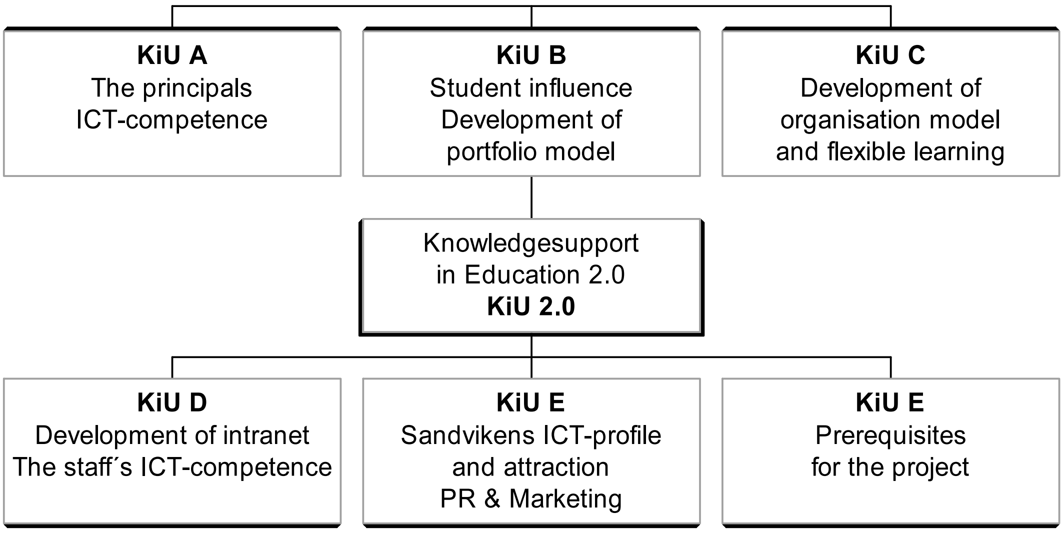

Figure 2.

Within the project there are two in-service-training opportunities addressing teachers and principals. One of them is *Flexible learning – an in-service-training model to become an e-learner,* earlier described in a paper from EDEN 2002 in Granada by one of the authors. The other one is *InfoComp,* an in-service-training aiming to enhance the staff's, and thereby the students' information literacy.

Information literate students

Investigating work procedures, "research" projects, problem based learning: there are many ways of working in primary, secondary and upper secondary school which means that students are independently searching for information. Their searching is seldom described more in detail than as they are searching for information at the library or on the Internet – the activity "information searching" is not looked at as problematic, there are no serious thoughts about the students' ability to perform "information searching". The picture you get is that information searching is something very easy and simple: the students can do this on their own, the library has the material they need, and everything is to be found on the Internet and so on. This picture even suggests that the students are good at information searching; they are even better than the teachers!

Current research on the topic shows another picture: that the students' knowledge about searching and using information is insufficient. The students are looking for the right answer, not from a variety of sources but usually from one single source. They cut and paste, they have great difficulties to extract comprehension from what they find and they do not have the ability to formulate questions or confront problems when they occur. They don't manage to critically check sources or navigate in text and they are having difficulties to formulate reasonable search criteria. They are rather information illiterate than information literate!

Information literacy – to learn how to learn

As a concept information literacy stands for different skills in an individual. Those skills allow the individual to process information and solve problems of various kinds. To handle information searching skillfully allows the individual to incorporate and use the information in a constructive way. This is a necessary competence in order to profit from studies at e.g. university but also in the perspective of a successful lifelong learning.

In the Swedish school the interaction between information searching and learning so far gets small attention. In the national curriculum for the compulsory school, Lpo94, there are paragraphs about *active learning* and *promotion of learning processes*. Other documents state that the students must have knowledge about how the information tools are used. The curriculum talks about skills comprised by information literacy, to obtain and use information in a lifelong learning – regardless of where it can be found or which methods or tools are being used.

To handle information searching can be seen as a skill – you are aware of searching strategies and relevant sources and know of some techniques. They can then be mediated by transition from e.g. a librarian to a student. Information searching can also be looked upon as a process to show its complexity. The process, in a learning context part of the learning process, means that the individual creates his own knowledge and strive to find meaning in the information in order to be able to lay a puzzle and fit it in to earlier experiences. A chain where thoughts, emotions and actions interplay and create new thoughts, emotions and actions distinguish the process.

7 faces of information literacy

Christine Bruce has identified 7 faces of information literacy:

- Information technology conception – using information technology for information retrieval and communication
- Information sources conception – finding information
- Information process conception – executing a process
- Information control conception – controlling information
- Knowledge construction conception – building up a personal knowledge base in a new area of interest
- Knowledge extension conception – working with knowledge and personal perspectives adopted in such a way that novel insights are gained
- Wisdom conception – using information wisely for the benefit of others

Information literacy and life-long learning

In order to make education in information literacy successful and have repercussions on school it is necessary that the participants have gained insight of its importance. It is not done overnight to genuinely understand the changes in society we are heading towards and their impact on the education system. If the insight is missing, then the crucial need will not appear which in turn could lead to a serious approach of the area.

Annette Skov, associate professor at the Royal School of Library and Information Science in Denmark, writes concerning the role of public libraries in life-long learning that if the concept of information literacy is taken to its fullest extent, the challenge of the public library is to get involved in the knowledge construction process of school children in collaboration with schoolteachers and school librarians. "Many people wishing to pursue adult learning lack study competencies."

Teachers and librarians must be aware of the problems information searching in learning situations is associated with: the character of the learning tasks as well as the pupils' reading comprehension and reading strategies, web tools and attitudes to information searching as "finding the right answer". Even more, there are often great lacks in learning the pupils the ability to check, value and criticize sources and in other ways process the information into personal achieved (?) knowledge. It is also of great importance that teachers and librarians are aware of the uncertainty that the pupils often feel when they are searching for information – and that they let the pupils know that these periods of feeling uncertain and confused is a natural part of the information searching process.

InfoComp – in-service-training to build information literacy

The project InfoComp started as cooperation between a EU-funded objective 3 program and Sandvikens overarching school development project Knowledge support in Education 2.0 (KiU 2.0). The goal is to enhance teachers', librarians' and students' level of information literacy. Taking advantage of the different strengths of librarians and teachers most certainly will positively affect the student's ability to deal with new learning conditions. InfoComp is a serious attempt to deal with this very important question.

Learning for school or life – or both?

We have already for a number of years been using the Internet as an information source but we have not really learned what is demanded to manage it. In Sweden we use to say, "you do not learn for school but for life". Our duty is to prepare the students to become responsible and well functioning citizens of the society. Of course we have always tried to handle that preparation as good as possible from what we have known and understood. Today it feels as if something is missing, as if there is something important we have overlooked. We would like to assert that it is the perspective of learning, the possibilities for lifelong learning.

People are considered to take a wider responsibility for their own education or progress of qualifications. It is often required that we continue forward by ourselves and try to find solutions and knowledge. Then the question is whether the way we learn in school also works outside school and if it is applicable in situations other than the school specific. It has to be if we are talking about lifelong learning.

We have generally been without methods and conditions without immediate subject connection to find information, process it and acquire new knowledge that can be of great use in different areas. These questions are largely based on what kind of theories of knowledge one has and what image one has of changes in society. Our curricula emphasize that "school shall support the pupils' learning, in order to prepare them to live and act in society". This can be interpreted as if learning is not going to end once you have finished school. A far more difficult matter is that "school is going to mediate the more constant knowledge which constitutes the common framework of society that we all need". What is constant knowledge in today's society? Further on pupils shall be ”given conditions to develop their abilities to work independently and to solve problems". Here we are approaching thoughts of a flexible way of learning, which can take place outside the institutions and make the students partly responsible for their own studies.

One could probably say that we in the present situation are in the middle of these discussions. It is important that we thoroughly talk about how these different statements are going to be interpreted. We cannot go directly to "doing" without understanding why. The changes must start in this insight, which can create a need. When the need has emerged, it can be satisfied through different kinds of education with a better chance of being successful thanks to our insights and understanding.

Conclusion

With *Flexible learning*, an in-service-training model to become an e-learner and *Info Comp,* an in-service-training to build information literacy as a starting line, the teachers and librarians hopefully develop knowledge about how to handle information literacy and learning. The teachers also get deeper insights about the library as a support for themselves in the development of new flexible forms of learning and for the pupils in their learning processes. And at the same time the librarians will get reasons to ponder upon their pedagogic competence and how you work to get pupils information literate. In the perspectives of the lifelong learning challenges, information literacy is indispensable if the process is to be put into effect.

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LOOK INTO MY EYES AND I WILL TELL YOU HOW TO LEARN

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Introduction

Over the last 10 years the Internet has become an incredibly important media for learning. By now e-learning is not a foreign concept anymore; millions of pupils, students and employees make use of it. Sophisticated technologies and new didactic concepts have been developed with the aim to make learning more effective, less expensive and adaptable to the needs of the individual learner. One technology which has not been used in this context so far is eye-tracking. The study of eye movements pre-dates the widespread use of computers by almost 100 years [1]. Eye movement research and eye tracking flourished in the 70s, with great advances in both eye tracking technology and psychological theory to link eye tracking data to cognitive processes [2] [3]. Meanwhile eye-tracking is used to study behavioural, cognitive, neurobiological and clinical aspects of eye movements. In our research we are concentrating on how information from eye-movements could be used to support the learning process. In most e-learning environments information is mainly provided by means of written text. Thus reading this information is essential for learning. The characteristics of eye movements during reading have been studied in great depth [4] [5]. Eye movements vary as a function of word characteristics [6] [7], legibility of the text [8], syntactic difficulty of the text [9], conceptual difficulty of the text [10], and whether it is being read silently or out loud [11]. Furthermore, eye movements during reading can reveal significant differences between individuals [12] [13]. As a consequence, the study of eye movements during reading has considerable practical applications in education psychology [14].

The presented research of the AdeLE (Adaptive e-Learning with Eye tracking [15]) project is focused on a new generation of adaptable knowledge transfer in e-learning environments. This new and innovative approach strives to capture user behaviour based on a real-time eye-tracking system (see also [16] and [17]). We apply eye-tracking to gather information about the learning progress. This information is in turn used for adaptive teaching in the e-learning environment.

Real-time Eye tracking (user tracking)

Defining a reliable set of parameters to monitor and interpret real-time user behaviour is one of the emerging research issues in the AdeLE project. Eye movements, scanning patterns and pupil diameter are indicators of thought and mental processing involved during visual information extraction [5] [18]. Thus, real-time information of the precise position of gaze and of pupil diameter could be used for supporting and guiding learners through their learning journey.

Very roughly, eye movements can be divided into two components: fixations, i.e. periods of time with relatively stable eye movements where visual information is processed, and saccades, which are defined as rapid eye movements that bring a new part of the visual scene into focus. However, more important indicators can be gained by analysing both components together with other derived parameters. Gaze duration (i.e. time spent on an object) and fixations are not indicative of attention per se, because one can also pay attention to objects, which do not lie in the centre of the focused region. For example, astronomers perform this fairly regularly when looking for faint stars or star clusters with the naked eye. Nevertheless, by considering other indicators, such as saccadic velocity, blink velocity, blink rate and pupil diameter, a better and more meaningful approximation can be gained. Saccadic velocity, for example, is said to decrease with increasing tiredness and to increase with increasing task difficulty [19]. Further, blink rate, decreasing blink velocity and decreasing degree of openness may be indicators for increasing tiredness [20]. Thus, if tiredness is identified, it should be possible through adaptive e-learning mechanisms to suggest optimised strategies such as the best time to take a break.

Application Scenarios

Although the AdeLE architectural framework facilitates a wide variety of applications (see also [16] and [17]), currently the research efforts of the AdeLE team focus on three issues, which are discussed in the following sections.

The first issue concentrates on finding eye-movement patterns which distinguish between skimming through, reading of and learning facts from written text. If a paragraph was only skimmed through instead of learned, the system could interact in an appropriate way. Of course, this method can not reflect information about pre-knowledge. Based on the information about content sections skipped or not learned by the user, adaptable and context specific assessment tests can be compiled to check the learner's knowledge about these particular concepts.

The second research challenge deals with scenarios in which the knowledge of the specific content accessed by the user (specific words, paragraphs, areas of pictures, tables, and the like) could be used for adaptations in real time. Knowing the exact gaze position could be used for providing additional context specific information. An animated picture could accompany textual information, whereas the integration of the picture proceeds in relation to the words or paragraphs accessed by the user, as illustrated in the following example. In an e-learning course concerned with Alexander the Great's Conquest of Persia, a map of Alexander's advance in the region is shown parallel to the text. The map content is updated in correspondence to the paragraph currently read by the learner. When the second paragraph about Granikos is being read, the map shows in animated form the journey of Alexander from Macedonia to Granikos. When the reader has advanced to the fourth and fifth paragraph about Alexander's journey to Gaugamela, the map is automatically updated with a corresponding illustration containing the passage from Issos to Gaugamela. Research questions related to this topic are "Does such an eye-triggered animation really help a student to learn?" or "How should such an animation be integrated into the text to support cognitive processes?" among others.

The third issue is to develop methods to extract individual learning strategies from the learner's gaze behaviour and adapt against the identified learning style. Comprehensive reviews of cognitive psychology research indicate that people exhibit significant individual differences in how they learn [21] [22] [23] [24]. A simple example being individuals who have a strong visual memory but weaker verbal processing will find text based material harder to process than individuals who have stronger verbal skills. In the traditional classroom environment a teacher has the chance to adapt or explain material to suit individual's needs. In e-learning environments where a teacher is frequently not present, pedagogical material is nowadays more uniformly presented. In the e-learning environment information about the learner's gaze behaviour would be a great opportunity to optimise material to the individual's needs. However, e-learning environments have high potentials to provide personalisation and adaptation of learning in a variety of ways, as discussed in [25].

Conclusions and Future Research

Eye-movement patterns indicative of reading, learning or disorientation should be detectable with our system. The ultimate goal of our approach is to interpret various users' parameters in form of input data for an adaptable e-learning system that assists users to improve their learning behaviour thus achieving better learning results. In the context of user behaviour interpretation, it is very important not to rely exclusively on eye tracking data, but to supplement it also with constant user feedback. It is possible to suggest optimised strategies such as the best time to take a break, the best time for repeating specific learning content considering the forgetting curve [26] or suggesting better sequencing of the learning objects. However, the user will always retain the final say over whether to accept or reject the system's suggestions.

Potential solutions that are based on findings from the presented ongoing research and proposed innovations are identified as follows:

- Support of learning processes in general and especially in application fields which need 100% knowledge acquisition such as aviation or traffic;
- Development of human-centred learning solutions that include these innovative approaches and provide better adaptive/adaptable appliances;
- Development of user-centred contents that support various learning styles;
- Development of low cost attentive workplaces, where manifold bi-directional information flow between human and computer is supported.

Evidently, the price of an advanced eye-tracking system plays a decisive role in the application possibilities of the AdeLE solution approach. Nevertheless, existing systems show that the eye-tracking device can be integrated into a standard monitor. Due to the continuing trend of rapid technical progress, we expect that in the next few years it will be possible to build a low-cost but high-quality eye-tracking system based on standard hardware components, which will be suitable for real-time analysis of eye-tracking information as described in this paper. This will make it possible to provide applications related to attentive workplaces for broad populations.

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COMBINING E-TUTORING SKILLS WITH ONLINE-COUNSELLING IN MODERN YOUTH WORK

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Introduction

The organisation wienXtra – a young city programme, offers a great variety of programmes in the field of leisure time activities for children, youngsters and families in Vienna. This work is subsidised by the City of Vienna.

One of these programmes is online-counselling for young people. In the year 2001 we started three discussion forums on the internet[1]. The first of these offers a general discussion of topics that young people are interested in, another for young musicians searching for a live gig or a new front man and the third forum as a “counsel and help” forum, a moderated discussion forum for all problems young people are confronted with.

This kind of counselling has many advantages: it is relatively easy for young people to get access to a professional counsellor by e-mail or a discussion forum online, and they can get this help in an anonymous environment which makes it easier to talk about personal problems and themes such as relationships, drugs, and psychological topics ranging from depression to suicide.

In the first months of this online youth work, we recognized that youth workers in the field of online-counselling need new qualifications and new skills: skills from the field of e-learning and e-moderating.

nachricht	absenderin	antworten	letzter eintrag
welche sprache?	Gast	3	29.01.2005 16:29:13
an alle Typen	rat&hilfeTeam	2	29.01.2005 16:18:07
DAS MACHT MIR ANGST!!	Gast	32	29.01.2005 16:15:41
trockener mund	Gast	6	29.01.2005 16:14:55
Ich will nicht essen	Gast	4	29.01.2005 16:13:33
punk oder skin?	Gast	50	29.01.2005 15:55:19
Wie schaut ein Punk aus??	Gast	67	29.01.2005 15:51:41
frauenarzt	Gast	6	29.01.2005 14:46:30

Figure 1. Youth discussion forum “counsel and help” with a range of 20 to 30 postings every day

Qualification of youth workers in online-counselling

At the first conference related to online youth work in September 2002 in Vienna[2], one of the outcomes was to create a course for youth- and social workers who want to work with their target groups in the World Wide Web. This conference widened the scope from youth work to different kinds of social work such as job coaching and the new field of psychological disturbances like online-addiction. From this point on, it was clear, that the incorporation of e-learning experts in the planning of e-counselling was extremely beneficial.

[1] http://www.wienxtra.at/forum/default.asp

[2] 27. Sep. 2004: F1 – Conference on Youth Discussion Forums, Email Counselling and Online Communication, Tech Gate Vienna.

A survey of youth workers in 2003 highlighted the main topics that should be included in such a course. Based on this survey we created, together with e-learning experts, a blended e-learning course [online.counselling] which started in 2004 featuring seven main topics:

- Module 1: Psychology of New Media.
- Module 2. Online-Communication (e-mail, discussion forum, chat).
- Module 3: Online-Counselling.
- Module 4: Law and Online-Counselling.
- Module 5: Technical requirements for Online-Counselling.
- Module 6: Management / Resources.
- Module 7: Quality Ensurance / Evaluation.

The course lasts from April to December and comprises 160 lessons (50 minutes / lesson).

The most important modules, 2 and 3, were planned as a mixture of face-to-face trainings and nine weeks of collaborative online work via a learning management system. This combination ensured that the participants could implement their new knowledge in the field of online communication easily in their daily working routines, and they had the experience of being part of a dynamic online learning community.

During the online sessions the participants had to work for at least five hours per week. Two e-trainers and one specialist in e-mail counselling accompanied this learning process.

Additionally, they had intensive training on writing feedbacks to the other participants, e.g. writing answers to e-mails connected with help and support, how to moderate a discussion forum, and how to manage an information overload.

Combining e-tutoring skills with e-counselling in youth work

The main part of the course [online.counselling] is a module which we took from an e-tutor qualification course. We transferred this module into the context of e-counselling, because one of the learning targets was to develop online-communication skills for people who had a strong experience in face-to-face communication but less experience in communicating with people or groups via e-mail, discussion forums or chat.

Some of the competencies e-counsellors need can be developed directly from e-tutor competencies:

e-tutor	e-counsellor
Competencies in online-communication in a learning environment (synchronous/asynchronous)	➔ Enriched with a psychological view of communication processes
Creating a humanized e-learning environment	➔ Creating a humanized counselling environment/setting
Role of a learning facilitator	➔ Role of an advisor/mentor and counsellor
Knowledge of self-directed learning and collaboration in online-communities	➔ Knowledge of self-directed psychological aspects and peer-to-peer counselling
Professional media literacy skills	
Professional technical skills	

Teaching e-moderating skills to youth workers is one key for successful online counselling. Another is to develop a clear setting for the online-communication and a well structured counselling process.

One of the results from Module 2 “online-communication”, is a structured model for e-counselling based on the Five Steps Model of e-moderating (by Gilly Salmon). We transferred these communication processes into the field of e-counselling.

A guide for e-counselling

Access and motivation – the clients need for problem solving

First of all ensure that you offer e-counselling which is easy to access. Also, make sure that it is easy to get in contact with the counsellors or the advisory board. Highlight the kind of counselling you can offer.

Online socialization – starting communication

In the next step allow the people to establish communication with the counsellor (e.g. by e-mail) or with the online community in a discussion forum (e.g. peer-to-peer counselling).

Information exchange – clarify the topic

Provide a professional counselling process which can be an instructive or constructive way to the next step. Be a motivator for the peers to exchange information amongst themselves.

Knowledge construction – working on problem solving

Working with clients in an online setting means having a special psychological knowledge of the different kinds of therapies and counselling strategies. Be a mentor or a counsellor for the clients and be aware of the limits of online-counselling.

In the context of online-counselling this can be the solution to the problem, or at least the creation of a potential path for the client to follow. Allow the peers in a discussion forum to be constructive in solving a problem together.

Development – integrating solutions or alternative communication channels

Offering possibilities for development in a direction that the client wants to go.

Maybe this can mean the end of the counselling process, or an invitation for the client to get into face-to-face contact with a counsellor or the advisory board.

Especially in cases of heavy psychological problems, this will be an important and meaningful development in the counselling process.

Evaluation and future scope

The evaluation of the course [online.counselling] 2004 has shown that the combination of a blended e-learning method for main parts of this course with the teaching of an online-tutoring module worked well.

In most of the written exams the participants had shown how much the e-learning skills had had a supporting influence on their daily work with the youngsters.

It has also shown that research related to online-counselling is strongly needed and not yet well developed. Questions regarding the possibilities of online youth work and the borders of transferring face-to-face work into the realm of virtual reality are not yet answered.

In an e-counselling environment it can be very helpful to look towards and to follow examples of the well established field of open and distance learning, especially the field of e-learning.

One of the goals in 2005 is to create a platform for online-counsellors in German speaking countries to build up a network of excellence and to provide research in this field.

Online youth work as in the field of online-counselling needs qualifications based on elements of e-moderating, e-tutoring and the knowledge of different forms and tools of online-communication. Combining these elements with classical youth work is a challenge for youth workers nowadays, and it is a great opportunity for young people looking for help and information in the World Wide Web.

WienXtra – a young city programme and its partners, Internet Centre for Education / Netbridge and the City of Vienna (Municipal Department 13 – Regional Youth Department) are deeply interested in and committed to developing this kind of modern youth work.

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ELENE-TT: E-LEARNING NETWORK FOR TEACHER TRAINING TEACHERS ARE LIFELONG LEARNERS TOO

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Introduction

The creation of the European Higher Education space is bringing about a major evolution in the learning environment for both teachers and learners. Lifelong learning and increased mobility, both physical and virtual, will mean that both teachers and students need to constantly update their skills, making the best possible use of the available technology within sound pedagogical and didactic frameworks. As students become more and more familiar with learning in a virtual environment, they ask more of their teachers, the teaching process evolves and consequently the learning process itself. This phenomenon has already been noted by many of the eLene-TT partners, whose will is now to accompany this process through the application of the results of recent research into e-learning and e-teacher training.

Background and rationale

A recent survey of e-learning in Europe notes the distinct need for universities to focus on improving the skills of teachers to implement ICT in pedagogically sound ways, *"…using ICT as a tool to redesign educational programmes, content and curricula on the basis of novel didactic frameworks*". [1] Furthermore, this report notes the *"…need for the exchange of experiences and good practice examples…*" as well as the *"…shortage of high-quality ICT-based teaching material*". A second report draws attention to *"…the lack of pro-active teacher/trainer development programmes […] and educational philosophy that the training of future trainers could be based on".* [2] The eLene-TT project addresses these needs directly and aims to provide a concrete practical response, backed up by the necessary research and analysis, which can serve as a basis for the improvement of teacher training, teaching and learning throughout Europe, with specific reference to Higher Education.

The ever-increasing use of e-learning and ICT in Higher Education places teachers in a position of having to learn and implement new skills and pedagogical strategies. The traditional academic model of university professors as 'the source of knowledge' with a mission to transmit this knowledge through lectures and publications is undergoing profound change. Learning to use ICT in teaching practices is less about mastering the technology than about adopting new pedagogical approaches to meet the needs of e-learning students. Multimedia course design, tutoring, managing collaborative work groups and problem-based learning are all aspects of the new teaching and learning paradigm, facilitated, but not dictated, by available and emerging technologies.

However, in order to motivate Higher Education teachers to integrate these new approaches effectively, their learning and professional development needs to be directly related to their work. Recent ideas in the literature on transfer and on-the-job training [3] suggest that learning and working have to be combined in order to support employees' professional development effectively: in learning situations – teacher training actions in the case of the eLene-TT project – the workplace has to be incorporated and attended to, as do the work learning situations (objectives, and activities such as employees' reflections). ICT can help bridge the gap between learning and working as it can be designed to meet the individual needs of the teacher as learner/worker, thus enabling the training actions to address all combinations of work settings, learning needs and learning styles.

Taking into account intercultural differences in both e-learning and e-teacher training, the partners are fully aware of the fact that the context in which Higher Education teachers are trained in each European country is very different, some countries possessing centralised teacher training institutions, others requiring specific academic qualifications in pedagogy and still others where the ability of a teacher to use ICT with students in pedagogically sound ways is not yet recognised in terms of career or financial incentives. The project thus takes a systemic approach, taking into account socio-economic and institutional factors based on the firm belief that teacher training cannot be considered an isolated pedagogical action. While the partners accept the fact that they are not in a position to dictate national or European policy, it is hoped that the results of eLene-TT will go some way towards helping policy makers make informed decisions on this matter.

eLene-TT: European collaboration for improving teacher training

eLene-TT (e-Learning network for Teacher Training) is a project funded by the European Commission *e-learning* programme and runs from January 2005 to December 2006. The driving idea behind eLene-TT is to improve the ability of Higher Education teachers to make pedagogical use of ICT, through the development of a Virtual Learning Resource Centre providing guidelines and resources for both teacher trainers and teachers themselves and through student-driven teacher training actions, pooling and testing tools and approaches developed by each of the partners in the wider European context. Improved teacher training is expected to have a significant impact on the quality and efficiency of the learning process of students and of teaching staff themselves, fully integrating the notion of workplace training for teachers.

eLene-TT brings together a number of HE institutions who may be considered front-runners in the field, covering a wide range of ICT-based learning contexts from total distance e-learning to on-campus support and mobile solutions.

The CANEGE consortium (France)

The CANEGE consortium, coordinated by Université Paris Dauphine, was formed in 2000 as part of the French Ministry of Education Campus Numériques initiative. Five universities work in close collaboration with the CNED (Centre National d'Enseignement à Distance), pooling their expertise in instructional design, teacher training and the implementation of online courses in business administration and economics.

eLene-TT is coordinated by Vidéoscop, the audiovisual and multimedia production department of Université Nancy 2, on behalf of the CANEGE consortium. Created in 1978, Vidéoscop is recognised on a national and European level for its expertise in project management and in the design and production of audiovisual and multimedia training programmes.

METID – Politecnico di Milano (Italy)

The METID Centre (Metodi e Tecnologie Innovative per la Didattica), set up in 1995, is a self-managing centre of Politecnico di Milano whose aim is to foster the development and adoption of innovative tools and methodologies in university teaching.

ZMML – University of Bremen (Germany)

The Centre for Multimedia in Education (ZMML) is a cooperatively operated competence centre for instructional technology, e-learning, multimedia solutions, applied information technologies and communications systems as well as communication networks and mobile networks.

Universitat Oberta de Catalunya – UOC (Catalonia, Spain)

UOC contributes to eLene-TT through a number of its departments and research teams. IN3, UOC's interdisciplinary research centre; Multimedia and Communication Studies responsible for virtual teacher training of UOC counsellors; TACEV, an IN3 research group for Collaborative Working and learning in a virtual environment.

The Department of Education, University of Helsinki (Finland)

The Department of Education is engaged in a wide range of research projects focusing on issues such as developmental work research, social and comparative research of schooling, ICT in education, life-long learning, the evaluation of education and the philosophy of education.

The Finnish Virtual University Service Unit / Helsinki University of Technology, Espoo (Finland)

The Service Unit of the Finnish Virtual University is based at the Helsinki University of Technology. It is a co-ordinating body for the Finnish Virtual University (FVU), which is a joint initiative of the Finnish universities aiming at supporting network-based teaching, research and ICT-services.

University of Umeå (Sweden)

A number of the university's departments have been mobilised for the eLene-TT project. The Centre for Educational Technology coordinating the enhancement of the use of ICT in learning environments; The *Centre for Teaching and Learning* providing training and consultation to HE teachers; The *Department of Interactive Media and Learning* providing education, research and development in the area of ICT in learning environments; The *Centre for Regional Science* (CERUM) conducting research on regional development and multidisciplinary research projects.

IVLOS Institute of Education, Universiteit Utrecht (The Netherlands)

IVLOS Institute of Education, a department of Utrecht University, provides teacher education, study skills training and services in the area of staff development and educational support, design and development. IVLOS also conducts education research and undertakes consultancy work for universities, colleges of higher education, government institutes and schools.

Marie Curie Sklodowska University in Lublin, on behalf of the Polish Virtual University (Poland)

PVU is a joint project of Maria Curie Sklodowska University in Lublin and the Academy of Humanities and Economics in Lodz with particular expertise in the design and production of online courses together with the development of methodological solutions, procedures and systems of students' management and training systems for tutors.

The eLene-TT approach

The project starts from the assumption that the most effective way of fostering the take-up of new pedagogical approaches is to involve teachers in the process right from the beginning. Seminars and discussion groups give teachers the opportunity to express their needs both in the type of skills they need to acquire and the way in which they wish to acquire them.

The main pedagogical concept behind the activities developed within the eLene-TT project is that of 'learning by doing'. The partners are convinced that training HE teachers in the pedagogical use of ICT is best done by a pro-active approach whereby teachers gain hands-on experience of the tools and methods available to them. Placing the teachers in the position of students themselves, using ICT and collaborative approaches in their own learning, will enable them to better envisage the learning process from the students' point of view and thus to better integrate these methods in their own teaching practice. Furthermore, a project-based approach, with the partners integrating the guidelines in their own day-to-day teacher training, will also ensure the match between the teachers' own needs and the training they receive.

This approach also draws on the notion of the support function of ICT in three types of learning activities: 'relate', 'create' and 'donate', as identified by Kearsley & Shneiderman (1998) [4]. ICT in higher education can enhance the relate-type of learning activities by relating different learners and experts (from different fields, disciplines), by supporting collaboration and communication of learners, by facilitating community building, providing (peer) feedback and by stimulating grouping of the learners. The create-type of learning activities would be enhanced through organising active learning, co-construction of knowledge, problem-based learning, designing and exploring as learning and critically reflecting. The donate-type of learning activities can be supported by ICT through authentic learning, of real-life learning activities, learning by working for a real client or financer, publishing and reporting the results of learning.

The project aims to provide concrete results beneficial to the European HE e-teaching community as a whole (institutions, teachers, tutors, facilitators, teacher trainers and instructional designers). Pooling and building on their experience, the partners are working on creating a set of guidelines for good practice in teacher training and selecting appropriate tools and resources by means of documentary analysis and the review of existing teacher training practices. These initial guidelines, tools and resources will be tested in real teaching situations, the teachers participating in the experimental phase implementing the methods and approaches with their own students. Feedback from both teachers and students will be analysed and assessed in order to refine the guidelines and make a final selection of resources, all of which be made available to the wider e-teaching community via a specifically designed Virtual Learning Resource Centre. Specific teacher training actions through local, national and European workshops combined with online collaborative work are co-designed, delivered and tutored by the partners, to ensure the results of the project reach the widest possible audience. The added value for the European HE community is thus expected to be a better understanding of the pedagogical use of ICT in learning, and of the way in which teachers themselves learn to integrate these practices, thus leading to higher quality ICT-based teaching and ultimately better learning.

Student involvement is of course central to this approach and the project pays particular attention to the implementation of new methods by teachers in real e-learning situations. A further driving factor common to all eLene-TT partners is the desire to find a balance between academic freedom and standardisation. Through the Virtual Learning Resource Centre, teachers and teacher trainers will have access to a wide range of carefully selected and tested guidelines, tools and resources, from which they will be able to choose those best adapted to the teaching and learning environments in which they are working.

Collaboration and communication

(h)eLene: a (h)uman e-learning network

eLene-TT is a project developed by the universities and e-learning consortia which participated as case studies for the report "*Studies in the Context of the E-learning Initiative: Virtual Models of European Universities (Lot 1) Final Report to the EU Commission, DG Education & Culture*".

From a loose group of institutions curious to know more about each other but driven by a will to pool their expertise for the benefit of the wider European Higher Education community, the eLene consortium has developed a true identity in which the human dimension is omnipresent. The project has its roots in the initiative of committed individuals and has grown through the development of transnational friendships. Perhaps atypically for this type of project, the development phase covered a period of over seven months, combining three face-to-face meetings and sustained online communication to construct a project in line with needs identified on a European level, where each member brings to the common project their own specific area of expertise in a spirit of human collaboration.

Presentation of work in progress

The project started in January 2005 with the launch of the first work packages: WP1: Analysis, WP2: Selection of tools and resources, WP3: Defining guidelines for teacher training. At the time of the conference, June 2005, we shall be in a position to present the findings of these three work packages. The first phase consists of needs analysis conducted with teachers through seminars and discussion groups, and the review and analysis of current literature and practices in teacher training on a European level. These practices have been benchmarked and criteria defined for assessing teacher training with respect to learning style, skills and competences. Work package 2 is concerned with the selection of existing tools and resources for teacher training, based on the criteria defined in WP1. The conference presentation will include examples and demonstrations of a selection of tools and resources – covering areas such as course design, tutoring, collaborative learning and self assessment – which the partners have retained for implementation in the forthcoming teacher training actions (second semester 2005). The criteria defined in WP1 also serve as a basis for drawing up guidelines for effective teacher training (WP3), aimed at institutions involved in teacher training, teacher trainers and teachers themselves. These guidelines, together with the methodology adopted for designing them, will be presented at the conference, focusing on the way this work has been carried out: a transnational group with different experiences and cultures finding a way to reach agreement and identify differences and similarities on key issues concerning teacher training for ICT in Higher Education.

Conclusion

The teacher training activities in eLene-TT fit clearly within the framework of lifelong learning for teachers, integrating the notions of learning in the workplace for higher education teachers, working and learning together on the innovative use of ICT in their education. This kind of learning (and working) is by definition lifelong as teachers will feel the need to learn during their whole career, especially in the field of innovative pedagogy using ICT in teaching and learning. A major feature of eLene-TT is thus about bringing e-learning closer to lifelong learning and the working life of teachers and students, opening up systems and increasing the openness of universities.

The partners are confident that through the dissemination and exploitation of the results of the project, the fostering of a community of practice and the development of a model for teacher training in the pedagogical use of ICT, the expertise developed will be transferable to the wider e-learning community, thus ensuring the sustainability of the project's outcomes. It is to be hoped that the model for a Virtual Learning Resource Centre will be taken up and adapted by Higher Education institutions throughout Europe, including those from the 'co-operating', 'self-sufficient' and 'sceptical' universities identified by the *Virtual Models of European Universities* report, thus paving the way for a European Virtual Campus for e-teacher training.

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E-PORTFOLIOS: A TEACHING STRATEGY THAT INTEGRATES E-LEARNING AND LIFELONG LEARNING

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1. Introduction

As the twenty-first century unfolds, it is not surprising that adults look with awe and wonder at the transformation of the society in which they were born. They have seen the world evolve from the industrial age to the age of information. "Change", as Cross (1991) aptly pointed out, "is now so great and so far reaching that no amount of education during youth can prepare adults to meet the demands that will be made on them". Thus, adults have become, out of necessity, lifelong learners in a world-wide learning society.

Contemporary scholars have named three major forces that are fueling the growth of lifelong learning in the post-industrial era. First, there is the changing demographic situation. In the United States, for example, the population as a whole is older and more diverse. The demand for learning opportunities for these groups has increased tenfold the need for continuing education. Likewise, in countries with younger populations, the need to learn throughout one's lifespan becomes even more critical as information and communication technologies (ICTs) double the knowledge base every three to four years.

This later phenomenon – ICTs – represents the second force requiring learning throughout the lifespan. The information explosion has dramatically increased the need for on-going education in high technology formats such as e-learning. Electronic teaching modes and delivery systems are necessary both to make education and training available to populations previously unable to obtain it and to keep pace with the exponential rise of data. This is underscored by Toffler's (1993) statement that "the illiterate of the year 2000 [and beyond] will not [only] be the individual who cannot read or write, but the one who cannot learn, unlearn, and relearn".

The third force, the international economic situation, has also made a great impact on the growth of lifelong learning. The global economy has changed the nature of the workplace. It is currently estimated that the average person in the United States will change jobs eight times in his or her lifetime. Consequently, on-going job-related education and training in e-formats has become a major feature of the work place. The need to continuously acquire new and adjust previously acquired-knowledge is required to function in our jobs, our families, and our communities.

This paper presents a teaching strategy, the experiential learning e-portfolio, which helps bridge the gap between the forces of demographics, ICTs, and the global economy by validating and connecting lifelong learning and e-learning. Portfolios enable nontraditional age learners and workers to (re)discover learning experiences acquired in the workplace and in the community. They can be utilized for college entry criteria, as a mechanism to obtain credits toward undergraduate degree completion, and as a career guide that allows employees to more fully participate in their professional development and assessment process. The inclusion of an electronic format in portfolio development "increases its power, especially the e-portfolio's key features of interactive hyperlinks and continuous reflection on and updating of learning" throughout the lifespan (AAHE, 2005).

2. Adults as Learners

The study of adult learning and development (Knowles, 1984; Kolb, 1984; Kegan, 1994) in the classroom and the workplace has revealed the importance of developing teaching methods that consider learning styles, prior experiences, motivation (Wlodkowski, 1999), developmental stage, and learning environments. Lindeman (1926) was one of the first educators to describe the unique pedagogical characteristics of adults as learners. Knowles (1984) adopted the term *andragogy*, first heard from a European colleague in the 1950s, to describe a set of assumptions about adult learners that guide educational and training programs to this day. Knowles noted that adults, in contrast to children, bring:

- A wealth of prior learning experiences to the learning environment;
- An internal rather than external set of motivating factors to learning;
- A need to apply what they are learning to real-life situations and problems;
- An independent, self-directed feature to the learning process, and
- A set of learning needs related to evolving social roles.

Knowles ideas, in addition to those of Kolb – who created a model for how experiences are transformed into learning – and Kegan – who examines learning from a constructive-development viewpoint throughout the lifespan, support the utilization of portfolios in the academy and the workplace. Portfolios utilize lifelong learning through reflection, analysis, evaluation, and communication to reveal where one has been, where one is today, and where one is going. They assist learners in building upon and utilizing prior learning. Sheckley and Keeton (2001) noted that no experience can lead to learning without reflection, the core of the portfolio process. Accordingly, in the fast-paced post-industrial era, reflective action, self-knowledge and critical thinking – by-products of portfolio creation – are key competencies valued in the academy and the workplace (Brown, 2002).

3. Integrating Adult and Lifelong Learning with E-Learning through E-Portfolio Development

Experiential learning portfolios, in contrast to academic portfolios produced by traditional age students, are a purposeful compilation of document-supported descriptions of learning outcomes acquired from professional and personal experiences. The portfolio intends to enable adults to gain college credits toward degree completion by reflecting on, analyzing, evaluating, communicating, and equating their learning experiences to knowledge gained in traditional classroom settings. In the workplace, they also serve as a career development tool, personal needs assessment mechanism, and worker-developed performance appraisal.

This type of portfolio is being utilized as a teaching and learning strategy in higher education institutions serving adults with increasing success. The portfolio allows adult learners to expedite their degree completion by gaining college credit for prior learning experiences and/or facilitate college entry for new or returning students. Popular in the Canada, the UK, Scandinavia, and Europe as the Assessment of Prior Experiential Learning (APEL) and in the USA as Prior Learning Assessment (PLA), portfolios enable learners to connect their academic life with their professional career (Evans, 1999; Brown, 2001). More important, it provides adult learners with the opportunity both to explore previous tacit learning experiences and produce new learning outcomes in critical thinking and communication (Brown, 2002).

Helen Barrett (2003), an expert in teaching e-portfolio development for teachers and traditional age students, believes experiential learning e-portfolios are a critical option to integrate lifelong learning with e-learning. Here is how she explained it to me in a correspondence concerning e-portfolios and experiential learning portfolios:

> I am also convinced that developing experiential learning e-portfolios can build self-esteem and contribute to transformative learning (Mezirow, 2001). In today's technological environment, my assumption is that MOST people will be constructing the written portions of their portfolios using a word processor, so they already have some of their work in digital form (Barrett, 2003).

Experiential learning e-portfolios created by adults incorporate Knowles' ideas on *andragogy* and Kolb's work on learning styles with Kegan's precepts on adult learning and development in an ICT format. They integrate the best features of lifelong learning and e-learning by enabling educators of adults to present a teaching strategy that embraces recognition of prior learning and ICTs.

4. Summary

Extensive research during the last three decades in the field of adult education on how adults learn and develop coupled with the proliferation of ICTs has placed e-learning and lifelong learning into the same arena. Thus two phenomena are occurring and intertwining simultaneously: 1) instructional strategies that address the needs of adults in higher education and the workplace and 2) distance and e-learning methods of development and delivery. Both are evident in university classrooms and corporate training rooms. Instructional strategies that incorporate these two realities are necessary to thrive in today's world. Understanding that learning takes place throughout the lifespan and giving expression to it through electronic methods is one way to meet the demands of the post-industrial era. The utilization of experiential learning e-portfolios enables adult learners to capture and express learning in a stimulating and creative manner. Integrating lifelong and e-learning in portfolio development helps adults evolve in thinking complexity making them more prepared to deal with the multiple challenges of their personal and professional lives.

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SUCCESS FACTORS IN VOCATIONAL TRAINING FOR TEACHERS IN POLAND

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Abstract

This paper examines the various factors to be considered and related challenges to be met if e-learning is to be an effective way of organizing vocational training for teachers in Polish educational context. The authors made an attempt to put together and categorize all the factors that are likely to influence the quality of teachers training delivered at distance. These factors interact with each other, none can be ignored without a harm to teaching-learning outcomes.

Introduction

Life long learning is expected from teachers more than from any other vocational group. In order to raise their qualifications and to achieve higher degrees of professional development Polish teachers follow special guidelines and instructions prepared by the Ministry of Education as well as take part in vocational trainings organized by local authorities responsible for teachers training. Until recently the great majority of training programmes for teachers in Poland has been prepared and conducted using residential mode of teaching and learning. The authors of this article strongly believe that, if well designed, e-learning courses may play a dual role in raising teachers qualifications. Firstly, they can constitute a good alternative to residential courses for those teachers who need more flexibility in time and place of study. Secondly, such courses can help teachers to overcome their fears towards computers in education and see in e-learning an effective and powerful tool for the provision of flexible learning in their own teaching contexts. However, if it is to be so, teachers training programmes which exploit e-learning as delivery medium, must be prepared very carefully taking into account numerous factors likely to influence the quality of learning output.

This paper provides an analysis of the very factors that need to be taken into consideration while designing an e-learning course for teachers. The factors are grouped into four main categories:

1. factors relating to national policy,
2. factors relating to andragogy,
3. factors relating to Polish teachers characteristics and finally
4. factors relating to effective use of learning technologies.

Factors relating to national policy

"The strategy for development of life-long learning by 2010" was adopted in 2003 by Polish Ministry of Education and Sport in order to set certain goals and objectives for vocational education in Poland. It builds upon "Common Employment Policy" created by the Commission and Polish Government and was extended in "Strategy for informatisation – ePoland". Such a strategy facilitates defining targets and draws a framework for a future development. Learning throughout the whole life becomes a necessity – Polish society faces exactly the same problems as a globalized European community. An increasing number of adults means a significant change on the labour and education market and such a strategy supports innovation and creativity. There are 6 strategic targets to be achieved by the year

2010, most of them directly affecting vocational education for teachers[1]. Training for teaching staff plays an important role in this document, aiming towards flexible system with certificates and quality standards. The quality of vocational training is to be improved by means of distance and e-learning, taking into account Polish context.

The strategy complies also with 'Bologna Process' and 'Lisbon Strategy'. It is sufficient tool to create an effective and innovative system of vocational courses for adults on a European level. It should be taken into consideration while designing any vocational programme, especially for the teaching staff. However, it is not defined completely and leaves space for innovation and change.

Factors relating to andragogy

This part of the paper draws on MacKeracher's (1995) principles about learning adults. Keeping in mind their own educational context the authors identified 6 main factors and the relevant challenges that affect the process of teaching adults.

Learning styles and strategies

Adult learners come to learning with different learning styles and strategies that influence what and how they learn. These various styles and strategies must be recognized and addressed in planning and designing for learning and student support. According to MacKeracher (1995) the possible ways to achieve this goal is either to provide a range of activities supporting different learning styles or to ensure alternative means for learning each aspect of the course.

Backgrounds and life experiences

Backgrounds and life experiences shape the way adult learners perceive the world and affect the process of building new understandings. Therefore it is crucial to provide students with tasks encouraging them to verbalize their prior experiences so that they are able to find a link between what is known and what is to be learnt.

Different goals and motivations

Adults learners know why they need to (or want to) learn something. They expect to be able to meet their individual learning goals during the course they attend. The flexibility of the provision of content is therefore very important. The learners must articulate their needs and expectations, if effective students support is to be provided. Students motivation also depends on whether or not they perceive the course content as relevant to the intended outcomes.

Responsibilities beside learning

Learning is only one of numerous occupations that adults learners pursue. Outside the learning context they face different responsibilities connected with their family, workplace and community. They struggle with time and personal resources constraints. Hence, the importance of the flexibility in course requirements, such as attendance and deadlines, should be stressed.

Identity

MacKeracher (1995) argues, adult learners have an established sense of personal identity and self-esteem. They do not learn well in competitive environments because the latter generate threats to be judged or ridiculed. Hence, it is essential to provide learners with learning environments that encourage cooperation and collaborative knowledge construction.

[1] The objectives are as follows: 1) Improving access to vocational training 2) Improving quality 3) Cooperation 4) Increase of investment in human resources 5) Consultancy and information resources 6) Increase of awareness

Support

Tait (1996: 59) argues, "(…) student support in open and distance learning, beyond the need to deliver teaching on a personalized and/or localized basis, represents ways of meeting fundamental human needs for social interaction in the educational context (…)". Adult learners can not be left alone with their struggle with teaching and learning content. Although they expect to be given some autonomy in planning their own learning activities, the assistance of a tutor is viewed as essential for the successful completion of the learning process.

Factors relating to the Polish teachers characteristics

There are several factors that shape the profile of Polish teachers. They all have to be considered and taken into account while designing for effective (e-)learning. The authors categorized the factors discussed in six major groups.

Age, qualifications, professional and personal experience and skills

Vocational training addresses teachers at different age and with different qualifications and professional practice. This has far reaching consequences for the design of e-learning vocational courses. In general, older teachers represent rather skeptical attitude towards e-learning. It seems that such an attitude can be derived from the low level of computer skills represented by this group of teachers in conjunction with the common unwillingness to change this state of affaires. "Teachers seem to be trapped between their prejudices and fears towards technology-driven education and, at the same time, demands for it." (Chrząszcz *et al.,* 2004). Hence, both the design of an e-learning course and the chosen delivery technology should be transparent enough to attract and motivate not only younger but also older teachers. It will give the latter a chance to diminish the gap separating them from their pupils as far as computer skills are concerned.

Regarding the age one more aspect also should be considered, namely experience. Once attracted and involved voluntary in a well-designed e-learning course, older teachers can become a valuable source of knowledge and information for younger learners as they have much professional and personal experience and represent rather deep than surface or achieving approach to learning (Calder and Wijeratne, 1999:127).

Motivation

Motivation tends to be classified as either extrinsic or intrinsic with the former usually seen in a negative and the latter in a positive light. Kember (1998), however, argues that one form of motivation can enhance and not necessarily decrease the other. The predominant motive of Polish teachers for vocational training is rather extrinsic – if they want to achieve higher degrees of professional development, they have no other choice but to participate in training programmes on offer and submit certificates obtained to the local authorities. However, what needs to be stressed here is that there is a variety of different training programmes for Polish teachers to choose, according to their interests. Hence, it is to be expected that teachers who decide to enroll in e-learning courses on offer will be both extrinsically (certificate) and intrinsically (interest) motivated. The role of the course provider and online support staff will be to enhance or at least to maintain teachers' prior motivation in order to facilitate the successful completion of a given training programme.

Personality and social skills

Teachers seen holistically are extrovert, open-minded, willing to listen to other people and to consider their motives and perspectives. They enjoy working cooperatively, they need to have people around and feel their presence. The latter characteristic can be seen as the reason for teachers' general reluctance towards e-learning. They often confine the notion of presence to the fact of being physically present in school and classroom. Haughey (1995) argues that many other dimensions of presence and distance are being ignored in this way. These are social, political, cultural, psychological and pedagogical dimensions, all of them with power to enhance the feeling of distance and diminish the feeling of presence. We all know from our school experience that "the instructor just as students may be present but uninvolved (and therefore distant) in conventional classroom". Hence, the challenge for the course designers is to make teachers experience that both the tutor and the student may be distant but involved (and therefore present) in virtual classroom. The best way to achieve this goal might be in the selection of teaching – learning strategies with emphasis put on shared learning, encouraging discussions and collaborative problem solving. If the course designers manage to help teachers to develop a sense of belongingness to the virtual community, they will help them also to reexamine the notion of distance so that they will be able to look at e-learning from a new perspective.

Gender, professional responsibilities vs. family commitments, free time...

In Poland women outnumber men in the teaching profession. Being simultaneously wives and mothers they have lots of responsibilities in addition to the vocational training programmes they try to complete. Course designers must bear it in mind while preparing the content and deciding on the workload and delivery technologies. The way teachers will perceive the technology, while enrolled in an e-learning course, will have a direct influence on the course dropout and persistence rates.

...Economic situation

The economic situation of Polish teachers is bad. They are underpaid and this situation does not seem to alter much in the upcoming future. Low income have many implications for teachers' professional practice, motivation and their image in the society. Polish teachers usually give some private tuitions after school, spending the time they actually have for preparing lessons on making some extra money necessary to provide for their families. It reflects on the quality of their teaching, and this in turn has an impact on the general image of Polish teachers in the society with the latter being rather negative.

E-learning courses have a great potential to struggle with teachers' time constraints. What might, however, impede the offering of such training programmes are participation fees. Therefore, one of the major challenges for the course providers is to find the simplest and cheapest solutions that will accomplish teaching and learning goals.

Location and access to resources

According to the results of TNS OBOP statistical research[2] only 30% of respondents declare to have access to the Internet. There is no statistical data that would provide information about the proportion of Polish teachers accessing the Internet from home or from school. However, it is to be expected that this number falls blow 30%. Therefore, for those with limited access to the Internet some off-line facilities must be provided, be it a set of papers or a CD ROM version of the course materials. Such facilities will enable the course participants to prepare the majority of the learning activities off-line and to log in only, if willing to contact their tutors and/or peers or place their contribution into the virtual learning environment.

Factors relating to the effective use of learning technologies

The last group of factors discussed in this paper relates directly to teaching and learning technologies. The factors discussed below constitute a set of guidelines to be followed by practitioners preparing e-learning vocational courses for Polish teachers.

'Learner's shoes'

In planning and designing for learning, the practitioners should be 'grounded in the learner's shoes' (Olgren 2000: 7). The learning environment has to be created with respect for learners' life conditions, personal resources, diversity of learning styles and learning strategies (Burge 2001: 153). Learning technology should be there for learners as opposite to learners being there for learning technology.

[2] Source: http://www.tns-global.pl/uploads/911/TNS_OBOP_Interbus_.doc

The choice of learning technology should be also affected by the analysis of teachers' preferences and their capacities to deal with the new media. Catherine Cavanaugh, teacher at Athabasca University in Canada, argues: "(...) our teaching comes with ideological and generational 'wrappings' and these are not only evident in our course materials but also in our approach to the new technologies" (Cavanaugh et al 2001: 66). Reflective practitioners should respect these 'wrappings' and involve teachers in making the choices of learning technology.

Tricky novelty

While deciding on a particular learning technology it is important to be clear about the reasons for one technology being privileged over another. Making a choice always entails some positive and/or negative consequences so the rational weighing-up of the pros and cons seems to be crucial if the technology is to be used effectively (Hermann et al 2000). Course designers should keep asking themselves whether their choices are optimal and any other possibilities, that might be more appropriate in a given learning situation, are not ignored only because they're attracted by the novelty (Cavanaugh 2001: 68; Spronk 2001: 23). Uncritical enthusiasm for a particular learning technology may have a detrimental effect on the learning outcomes. Therefore it is important, but also very challenging for a practitioner to control and critique his or her own objectivity.

Transparency

If learning technology is to be effective it cannot be opaque. The approach to the use of learning technology must differ according to the learners' profile and the discipline to be studied. To address learners representing different learning styles and strategies a mix of learning technologies should be provided and a strategic balance between old and new should be maintained (Burge 2001: 155), for only then learners will be able to perceive the technology as a transparent and useful means to meeting the learning goals. As Olgren (2000: 12) argues, "learner's energies should remain focused on learning and not on operating the equipment".

Support

Any learning technology, if deprived of appropriate support, will fail to fulfil its function. It takes time to adapt to the new learning environment. Learners may feel uncomfortable and stressed using a given learning technology for the first time and will need some support to overcome these negative feelings and to shift the focus from devices to learning. Therefore "it is important to allow adult learners enough time for 'bedding down' the learning technology – that is rendering it reliable and very easy to use" (Herrmann et al 2000: 46).

Competition vs. cooperation

As Edwards and Tait (2000: 134) argue cooperation provides best conditions for innovation. However, what is to be observed within educational organizations has little to do with cooperation and can be rather described as competitive approach to adopting new learning technologies. Therefore, the biggest challenge is to promote dialogue among different educational bodies and stakeholders and create rules for effective collaboration where everyone invest and everyone benefits.

Quality control

Hornik (cited in Perraton 2000) argues: "Though we know how to run ODL effectively, we do not in practice do so". It's easy to theorise, it is much more difficult to put the theory into practice. If one has to struggle with different unexpected adversities, incompetent colleagues, unfavourable decisions, limited resources and time constraints, one may tend to ignore some of the important rules and principles, which will inevitably reduce the quality of output. Reflection-in-action and the flexibility of action can help to deal with such problems. Reflective practitioners must be able to modify their action according to the changing situation so that the quality of output is assured.

Evaluation of output

Evaluation is one of the most important principles in the teaching and learning process. It is the only way to check if our assumptions about the adequacy of a given learning technology were right or wrong. Knowledge gained from the analysis of how people learn from different media and whether they perceive it as helpful or opaque provides very important information for the future selection of learning technologies (Olgren 2000: 15).

Public policy

One of the effects of globalisation is that different policies migrate around the globe and are being adopted and contextualized by national policy-makers (Edwards and Tait 2000). Because today's education is strongly linked to the ICT infrastructure and the economic development e-learning providers must be familiar with public policy literature that is to influence the field of education and the use of learning technologies (Roberts et al 2001:35).

Conclusions

If the process of adopting e-learning in the vocational training for teachers is to be successful all the factors named in this paper need to be taking into consideration. These factors are strongly interrelated, they enhance one another. The lack of one of them in the process of designing for learning may be the reason for a failure.

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A TREE STRUCTURE AND THE TOOLS OF AN E-BOOK

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Abstract

The article offers a description of a new model of academic textbook based on modern multimedia tools. The new model was specially designed for the distance studies via the Internet offered by the Warsaw University of Technology. A detailed description of a universal structure of a textbook (e-book) is followed by the description of the tree model of a lecture both from the technical and functional perspective.

1. Introduction

The academic book as well as the lecture has always been associated with the university teaching. Both a textbook and a lecture constitute a source that enables students to develop their knowledge. However, there is no clear boundary between a textbook and a lecture that would clarify which of these forms of education plays a more important role. In the engineering studies, especially during first terms, an academic textbook constitutes an elementary source of knowledge. In time, both books and academic publications tend to play a major role in education.

In short: a textbook is written in such a way that students can easily understand the material and put this knowledge into practice.

For the last 500 years a textbook has had a form of a printed manual. The 1990s, however, altogether with a modern technology of saving texts, drawings or figures introduced a new way of storing written material: on floppy discs, hard discs, CDs or DVDs, on servers of educational portals or in e-libraries. The electronic material can be printed, displayed on the monitor or screen of the lecture room. That form of saving the written material gave way to e-books, known also as multimedia books [1,2,3].

The new form of academic textbooks is a subject to constant development and improvement. This involves: (1) absorption of new techniques of presentation, animation and simulation and (2) development of forms of saving, arranging and conveying knowledge. The new model of textbooks is especially useful in distance learning via the Internet [6,7].

In the academic year 2001/2002 the Center of Open and Distance Education (CODE) of Warsaw University of Technology established a new, tree model of an e-book [4,5]. The newly developed textbook replaced both written manuals and lectures.

Apart from the text material, the multimedia book contains also information that is usually given during the first meetings at the lecture (e.g. course requirements, course credits etc.). That is why, while designing an e-book one has to bear in mind that a multimedia book replaces not only a printed book but also lectures.

The details about the structure and tools of a herringbone model are briefly presented in the present article.

2. The academic textbooks

In principle, an electronic textbook should not differ much from the traditional printed academic manual. Hence, it should enable a student to understand the material and put this knowledge into practice. The textbooks in the fields of mathematics, physics, engineering or technical studies should be characterised by: precise definitions of terms and concepts, clear and precise reasoning that avoids unnecessary digressions, plenty of examples and solved tasks illustrating the problem discussed and a large number of tasks and problems to be solved by a student.

Another important element of the academic textbook constitute tools used in the production of such a manual. The traditional printed books make use of broadly-known tools of printing technology. These are: fonts (in bold, italics or colour ink), mathematical formulas and equations, drawings (simple bi-dimensional illustrations or complex structural drawings), photographs and background colours.

Although the publishing industry has developed a variety of tools used in the production of books, most of the academic textbooks are offered in the black-and-white form.

All the above considerations, altogether with instructions found by Montesinos [2], should be taken into account when producing an e-book. A separate problem constitutes the choice of new tools offered by the multimedia technology. In the first place, the following multimedia tools should be applied in the production of an e-book:

- written comments;
- audio comments;
- video clips;
- PowerPoint animations with the audio comments applied by the lecturer;
- calculations simulation illustrating theoretical reasoning;
- test generator.

The didactic material of the textbook should be presented on the Internet Learning Space platform and also in the form of a simple CD. As a result, the number and length of video had to be reduced to a minimum.

3. Electronic lectures and their surroundings

The structure of e-books is shown in Figure 1. When compared with its last edition [4] the structure of the textbook has undergone several alterations. Moreover, the content of some of its points has also been changed.

The e-book contains a main port. The four other columns, as seen in Figure 1, show four levels of the structure. The left column includes the most important element: a table of contents of a course. Each title gives access to the material included in the textbook.

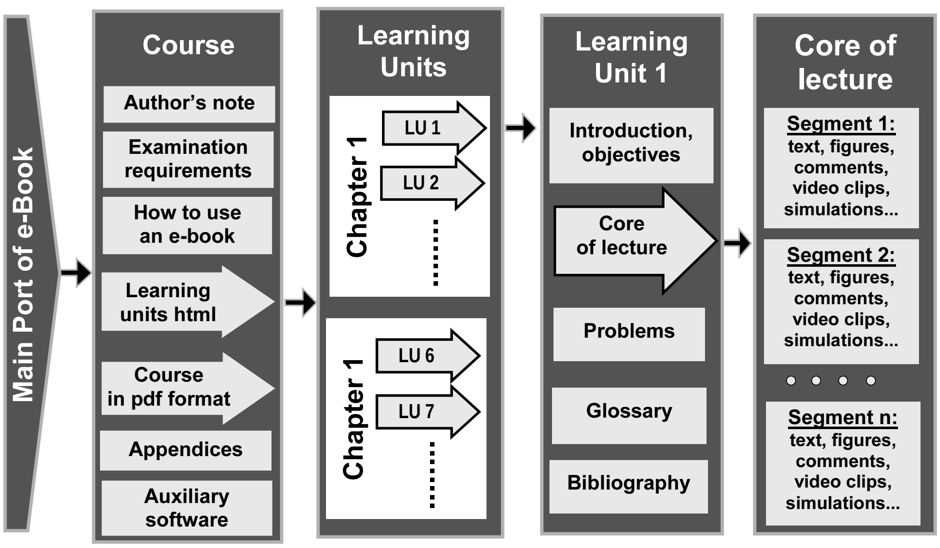

Figure 1. A structure of an e-book

The most important and extensive part constitute Learning Units (LU), cf. the central column. The topics of each Learning Unit may be grouped into chapters. The third column shows the structure of one Learning Unit which is stable for each LU. The fourth column contains core of a lecture, that is a basic source of knowledge that the lecturer intends to convey. The herringbone model is specially designed for the lecture element of the e-book.

The e-book contains the following parts:

- *Introductory part*
  - Author's note
  - Examination requirements
  - How to use an e-book
- *Learning Units html*
- *Course in pdf format*
- *Additional material*
  - Appendices
  - Auxiliary software

Both the *Introductory part* and *Additional material* constitute a background for the core of a lecture; these materials make the student familiar with the content of the programme; include a variety of facilities and supplementary software, etc. The following is a brief description of the chapter contents.

Author's note – this part of an e-book should include several key points, e.g.:

- information about the authors, including video clips; the authors introduce themselves, say few words about the department or institute they work in and give a short account of their main interests and research;
- content description of appendix;
- supplementary software description, saved on the CD-R, and instructions of use.

The part *Examination requirements* is very important, especially from the point of view of students. This part should contain the following information:

- What to do to understand? – here, the authors take for granted the fact that students are familiar with the material learned in previous semesters/courses;
- Lesson Syllabus – a key element which should be carefully planned by each lecturer;
- Examination requirements and conditions of gaining credits – another important element in which a lecturer explains the main parts of the exam, types of tasks and problems to be solved.

The part, *How to use an e-book* includes, among others, answers (in form of instructions) to the following points:

- computer requirements – this part explains how to get access to the Internet and portal and what to do if the e-book cannot be accessed or opened;
- tools' description – this part gives for instance instructions of how to use the tools managing the textbook.

The *Learning Unit* page contains table of contents. Lessons in the AdobeAcrobat pdf format were created to allow students print the elementary didactic material. The lessons in the pdf format are, however, entirely passive.

In *Appendices*, the author can include various elements. The most important element is the index of terms and definitions supplemented with tables of phisycal constants, copies of some publications, instructions of how to use the software, etc.

The textbook is additionally supplemented with a software, both universal and technical, e.g.: short descriptions, installation instructions etc.

4. Learning Units

Each Learning Unit should display table of contents. The structure of a Learning Unit is shown in Figure 2.

Figure 2. Learning Unit structure switched on the lecture.

Students are automatically directed to the Introduction units, a key element of the lecture that contains the following points:

- Objectives – precisely explained aims and requirements that students are expected to know after finishing a given Learning Unit; The number of objectives should be limited to 6 to 12 points.
- Initial requirements – that is, what should be known to understand a given Learning Unit; in some circumstances the author of the lecture may start with a two-page revision of a required material (this is to be found by a special link);
- Lesson Characteristics – this information may be found in the Introduction part; it may contain descriptions of the main objectives of a given Learning Unit, possible difficulties encountered by students or the significance of the material included.

The lecture is the most important part of an e-book. It constitutes a basic element of the Lesson Unit. The lecture is usually long and it covers about 15 to 25 pages. That is why it is advisable to divide a lecture into several segments. The navigation is based on the segments or parts found on the left margin of the monitor, as shown in Figure 2.

The Problems part is a collection of tasks and problems which are either solved, partly solved or to be solved. The type of tasks that may be included in the final exams can be specially marked by the lecturer.

At the end of each Learning Unit the author may put in a Glossary i.e. a collection of definitions or terms introduced in the particular Learning Unit. Students may evaluate whether they managed to learn and understand all the terms.

Bibliography is a list of books and publications that are helpful to understand the material lectured in the particular Learning Unit. All publications should be easily accessed, that is why it is advisable to list only those publications that are found in e-libraries.

5. A tree structure of a lecture

A structure of any printed book is known as linear, that is one element is followed by the second element: texts, drawings, computations, examples, bibliography, discussion of possible solutions to some tasks, all arranged in a particular order and proportions by the author of the book. The only exception are footnotes, usually put at the bottom of the page, and Appendix.

An e-book, using the so called hypertext allows to write a lecture in the so called herringbone structure, as illustrated in Figure 3. Here, the main text of a lecture takes form of a broad summary with some additional examples. The specially prepared links direct students to additional material: written or audio comment, video clips, PowerPoint presentations with audio comment, text generator, analogous solutions, etc.

New tools mean new possibilities of editing textbooks. The authors are encouraged to make use of six such tools, shown in Figure 3. The elementary material of the main lecture of the Learning Unit is given in segments or points. Students, while working on a didactic material of a main lecture may be directed to additional files containing plenty of information (comments, drawings, video clips, detailed introductions or simulation programmes, etc.). Each segment allows students to understand a new material quickly and easily.

During studies students will often come back and revise the material included in the main lecture. That is why this material should have a clear and complete form without unnecessary digressions, additional animations or explanations.

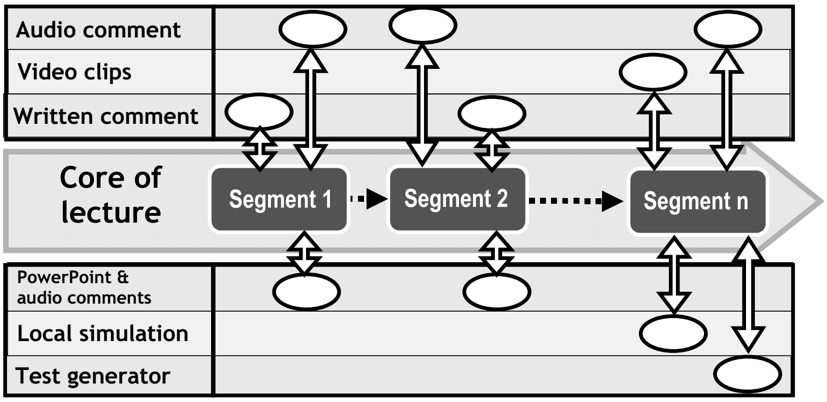

Figure 3. A tree structure of an e-book lecture

Students can listen to chosen comments in order to revise the main objectives of the lecture, to find an explanation or a proper solution. The overall structure may depend on the author's inventiveness. All additional explanations, revision tasks or even humorous comments do not prolong the lecture and do not disturb its proportion. These additional elements do not only play an ornamental role but also enable students to acquire new skills in an easy and interesting way.

The tree structure of a lecture has many advantages. It allows the authors to use a variety of multimedia tools in order to create a comprehensible material. Students can easily understand the lecture by revising the material or looking for particular information. The survey conducted among the users of linear textbooks and tree textbooks proved the advantage of the latter.

6. Conclusions

An e-book is a new product of the teleinformation technology. At first it was treated as another way of saving and storing material to be printed. In time, it was found that an e-book may be supplemented with didactic materials for students with additional printed information, with illustrations that enable students to easily understand a lectured material.

A tree structure of an e-book, designed and created in the Warsaw University of Technology, makes use of a variety of commonly used teleinformation tools. The new model of a textbook was created for distance learning students in order to replace both a traditional printed textbook and a lecture.

In an attempt to foresee the future developments of the e-book technology the following two points may be taken into account:

- in a short time lecturers will be offered new tools that will enable the creation of Learning Units containing simulated experiments and the conduction of live experiments via the Internet;
- cheaper and more common DVD production will enable to store much more information and didactic materials on a single disc.

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THEMATIC NETWORKS IN THE ESTONIAN e-UNIVERSITY

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Abstract

Estonian e-University is a young consortium of eight Estonian universities that is aiming to advance e-learning and educational innovations at large in Estonian higher education. In this paper we are describing the first results of a study carried out by Estonian e-University and its foreign partners within the framework of Minerva project UNIVe. The series of inter-related qualitative case studies focused on the success factors of the thematic networks in the context of developing new joint academic e-learning programmes within a certain academic domain.

About Estonian e-University

Estonian e-University (EeU) was founded in 2002 as a consortium consisting of the Estonian Ministry of Education and Science, Estonian Information Technology Foundation (EITF) and six higher education institutions:

- University of Tartu (www.ut.ee)
- Tallinn Technical University (www.ttu.ee)
- Tallinn Pedagogical University (www.tpu.ee)
- Estonian Agricultural University (www.eau.ee)
- Estonian Business School (www.ebs.ee)
- IT College (www.itcollege.ee)

In 2004, EeU accepted two new associated members: private universities Audentes and Academy Nord. Upon the creation, the founders were involved in numerous discussions on the form of the would-be e-University. As different models were used by different countries, there were ideas of a UKeU-like holding company as well as more non-profit ways (foundation supporting innovative R&D projects, association). Finally a decision was made that Estonian e-University will start off as a project organisation supervised by the Estonian Information Technology Foundation, with a perspective to grow into an independent inter-university organisation in the future. The neutrality of the coordinating institution sets a good ground for cooperation among highly competitive Estonian universities. The steering group of the EeU consists of high-level administrators from each partner institutions, most of the universities are represented in the steering group by vice chancellor.

The goals of EeU were outlined in the following way:

- Coordination of cooperation between universities and applied universities based on principles of profound studies.
- Increasing the availability of quality higher education for students and other people willing to learn, for example adults, handicapped people, Estonians abroad and foreign students.
- Educating lecturers of universities to compile and practice quality and efficient e-courses.
- Providing lecturers with necessary technical equipment.
- Improving the reputation of university education in Estonia and creating contacts for cooperation between foreign universities and business circles.

The process of establishing the EeU was initiated by a group of Distance Education and Educational Technology specialists from three largest universities, this group had been collaborating within different development projects (Phare, Minerva, Tempus) for years. The final impulse for joining up was the radical increase of the price of WebCT licences – buying one licence for consortium instead of 5 institutional ones seemed to be the solution for saving some money.

From the very beginning of the EeU, there have been extensive discussion whether the EeU should have a unified learning management system (LMS) platform. While WebCT has gained a good foothold in Estonia (used by University of Tartu, Tallinn Technical University, Estonian Business School and IT college) its future acceptance has recently been seriously challenged by its changing pricing policy as well as increasing competition offered by free, open-source LMS's. While some Estonian universities have experimented with open-source systems as alternatives, Tallinn Pedagogical University has chosen to develop a completely new, free LMS based on innovative pedagogical approaches. The system called IVA, besides being the official e-learning platform within TPU, has come into use at other Estonian educational institutions as well as some foreign universities. Currently, WebCT and IVA are both recognized as official LMS's within EeU consortium. Three-year contract with WebCT was signed after a year-long pilot testing of alternative LMS's by the EeU partner institutions. Comparative study of five systems (WebCT, Luvit, Fronter, Edutizer, IVA), involving the actual use of each LMS in three different universities resulted with the selection of WebCT.

EeU has been actively building the cooperation and links with other European universities and associations. In June 2003 it was accepted to the European Association of Distance Teaching Universities. In September 2003, EeU launched its first international project with the support of EU Socrates/Minerva programme. The title of the project is UNIVe: Creating network-based e-university model for the small countries in the context of e-learning in Europe. The UNIVe project is aiming to promote and provide access to improved methods and educational resources as well as results and best practices in on-line education. The goal of the project is to create new quality in European e-education among the universities through integration of available e-learning know-how of the previous successful projects funded by EU and creating an e-university model for small countries with limited resources and ICT/ODL experience.

UNIVe project: towards a model of a consortium-based e-university

As it was pointed out by Terry Anderson in his keynote speech of the Third EDEN Research Workshop, one reason why educational research does not get respect and is under financed, is caused by our insufficient ability to learn from previously made studies, from successful and failed development projects. We are not so effective in benefiting from the experiences of others and in many cases, even if we are aware about similar projects, we are not eager to utilize this knowledge and put it into practice. Learning from others means, that we are able to learn from others success and failures, and are able to adopt the previous research results according to our needs. But learning is not enough. We should not be only the 'taking part' but according to our experience and expertise, we should give something back. Only then we can ensure, that we are behaving like a learning organisation, where the knowledge is improving from stage to stage. Learning from others and giving back improved expertise, is the main idea behind the UNIVe project that started October 2003 and lasts until the end of year 2005. Project consortium consists of EITF (the coordinator), EADTU, four Estonian universities (UT, TTU, TPU and EBS), and four universities from other European countries (University of Stirling, University of Joensuu, Helsinki University of Art and Design and Mid-Swedish University). The activities in the UNIVe project are structured into six strands:

- Accessibility of information, exchange of study materials and courses.
- Staff training.
- Quality Assurance.
- Recognition and accreditation of studies.

- Reaching different target groups.
- Thematic networks.

In this paper, we are focusing on the last strand that is aiming to develop some general guidelines for initiating and supporting the thematic networks.

Case studies of successful thematic networks in European higher education

Our approach was based on the idea of the social networks in the context of educational innovation that can be interpreted as the communities of practice, described in the literature by Lave and Wenger (1991), Seely Brown and Duguid (2000), van Winkelen and Sliwka (2003).

Following the common methodological guidelines, four UNIVe partner institutions conducted case studies of the existing thematic networks:

- Ingonline (www.ingonline.nu) – a Swedish engineering program offered in collaboration between eight Swedish higher education institutions.
- KASVI (kasvi.joensuu.fi/kasvi) – a thematic network of educational scientists within the Finnish Virtual University.
- @duline (www.tkk.utu.fi/aduline) – two high-quality, innovative on-line courses (Designing On-line Learning and Tutoring Adults On-line) that were developed and pilot-tested jointly by an international network of experts from six different European countries (within a Grundtvig project).
- TNTEE (tntee.umu.se) – Thematic Network for Teacher Education in Europe, an innovative Erasmus project from 1996-1999. We focused on one sub-network of TNTEE that was afterwards resulting at two large-scale Erasmus projects: EDIL (European Doctorate in Interactive Learning) and EUDORA (European Doctorate in Teaching and Teacher Education).

The cases were selected so that they would match the following criteria:

- the network should be considered as "successful" in the sense that it is a viable social structure that exceeds the life span of one project and has produced at least one joint study programme involving different higher education institutions;
- the network should be recognized on the European or national level;
- the network should be focused on one of the four primary target areas for UNIVe pilot networks (IT, environmental science, educational science, engineering).

The data for case studies was collected mainly from the official Web sites of the networks under study, but also by interviewing the persons actively involved in these networks. The qualitative analysis of the gathered data was grounded in five dimensions:

- social (scope, international cooperation, reasons for networking, social impact);
- technological (novelty of solutions, technical support, scalability);
- managerial (effectiveness of administration scheme, diffusion of innovation);
- educational (promotion of new pedagogy, coherence w Bologna process and national educational strategies);
- financial (budgetary constraints, cost-effectiveness).

As all four case studies are available at the official Web site of UNIVe project (www.htk.tpu.ee/UNIVe), there is no need for providing detailed summaries of each in this short paper. The main general conclusions from these case studies could be drawn in the following way:

- successful networks have explicit and shared vision, goals and plans that are not too ambitious nor utopistic;

- successful networks are emerging from existing communities of practice, they are supported by a grant scheme in early phase and are working from the beginning on the “exit scheme” (trying to work out the ways of existence after the end of the grant);
- successful networks have a broad-based steering group, consisting of highly recognized scholars in the field;
- successful networks are able to work out win-win schemes for cooperation among cooperating universities, that do not have to involve financial contracts;
- it is important to fix the levels of cooperation while developing a joint study programme – it could be useful to leave collaborative activities and shared responsibilities on the programme level, not on the course level;
- there are no perfect examples of recognition schemes of joint European study programmes, but due to the Bologna process, the new developments are expected in this direction soon.

During the year 2005, UNIVe partners are going to use the results of these case studies in the process of initiating and supporting the growth of four pilot networks within the Estonian e-University.

Conclusions

Thematic networks seem to be a powerful means for promoting the new tools and methods of e-learning among the conservative academic staff. Building a well-functioning and outcome-oriented community of practice within one academic field could help us to overcome the problems related with lack of co-operation between competitive higher education institutions. Estonian e-University is trying to learn from the experiences of the previous studies and successful projects in the academic networking.

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A HOLISTIC APPROACH TO SUPPORT E-LEARNING ON NATIONAL LEVEL – CROATIAN STORY

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Ivica Matotek, Croatian Academic and Research Network – CARNet, Croatia

Introduction

Croatian Academic and Research Network – CARNet was created in 1991 as a project of the Ministry of Science and Technology of the Republic of Croatia. In 1995 the Government of the Republic of Croatia issued a Decree on founding of the CARNet institution.

In Croatia, CARNet is best known for different services it provides to its members – Croatian higher education and scientific institutions. At the beginning, the services were mostly in the domain of Internet infrastructure – both ATM connections between academic nodes and dial-in access for Croatian students and teaching staff.

Even before 1999 it became apparent that e-learning, which had been at the time seen as a new paradigm for education in the forthcoming century, hadn't been practiced enough in Croatia, while there had been some successful pilot and infrastructural projects in the wider region. Internal education and attendance of conferences and workshops by CARNet e-learning pioneers, led to the conclusion that a stronger push and motivation was needed, and that CARNet should have the leadership in the field.

Practising e-learning seemed impossible without a course management system and services surrounding it, so the search for the most advanced, yet affordable system had taken place during early 2000. In the mid 2000 WebCT was chosen as a platform, and technical part of the problem seemed to have been solved. However, it was obvious that there were many other challenges ahead, and due to CARNet's expertise in the field of face-to-face training, some were properly addressed during that time. Some however became visible later, when the feedback from the first online course designers and tutors started to reveal new needs.

Building technical support services

After the initial installation of the server, Windows NT operating system and WebCT Campus Edition, the first support group was involved in the process – taking care of the server, particularly system administration tasks such as:

- server management:
  - hardware maintenance;
  - OS maintenance (Windows NT and later Windows 2000 Server);
  - WebCT maintenance;
- user management:
  - designer accounts;
  - teaching assistant accounts;
  - student accounts;
- course management:
  - opening new courses;
  - deleting old and no longer used courses;
  - backup creation and recovery.

Since the license enabled CARNet to offer designer and TA accounts to all interested teaching staff intending to develop and run online courses and student accounts for their students, it became obvious that a *helpdesk-type support* was needed. Therefore, an *e-mail address*, and a 4-hour-a-day *telephone line support* were set up enabling teaching staff and students to contact helpdesk. The support was primarily technical.

Before 2003 there was only one person dedicated for the job. But soon, as number of courses grew, it became obvious that support should be distributed to different groups of experts, and that holistic approach would be most appropriate, since all kind of CARNet user needs would be best addressed this way.

From technology to pedagogy

Soon, it became clear that designers were having difficulties creating online materials and teaching activities. The analysis showed that the main reasons for that were:

- there was little or no knowledge of basic principles of instructional and course design;
- the designer community was small and unorganized;
- the user interface and documentation were available only in English.

To address the need of the lack of instructional and course design knowledge, a *2-day face-to-face workshop* was created. It consisted of the following parts:

- introduction to e-learning;
- introduction to course design with WebCT;
- course design basics;
- file management;
- successful communication/discussion boards and chat;
- quizzes;
- advanced quizzes with multimedia.

It proved to be very successful, since over 400 people have taken the course over the last three years.

Recently, a *1-hour face-to-face WebCT orientation course* for students was created and ran for the first time for participants of the CARNet E-learning Academy (ELA), a joint project between CARNet and the University of British Columbia from Vancouver, Canada.

To boost knowledge and experience sharing, designer *mailing list* has been created. All news concerning events interesting for designers have been sent to the list in recent years. Although the general idea of the mailing list was primarily to be two-way, not too much interaction has been happening there. Therefore, for significant news concerning the support service, *birds-of-feather meetings and other types of social gatherings* have been organized.

The last one in 2004 took place during the CARNet users conference (CUC) in late September, when it was announced that the project of *localisation* of the WebCT interface to Croatian language was over. Since then, it has been possible to use WebCT interface in both Croatian and English, and this step was important for majority of secondary and primary school teachers and pupils who either couldn’t speak or spoke English badly. At that time, CARNet started to orient more towards schools and no longer exclusively towards the higher education sector, so the timing of the project seems to have been very convenient. For school teachers and pupils as well as for many other who are naturally more comfortable using their mother tongue during such vulnerable process as education, this was a giant leap for easier acceptance of e-learning.

Since previous experiences at the Faculty of Electrical Engineering and Computing, University of Zagreb, showed that usage of an IT service grows if potential users read or hear about it from the sources outside they own institutions such as daily papers or TV, *press events* were seen as a tool not only for marketing purposes, but also positive way for encouraging people to use e-learning more.

As e-learning in Croatia grew, during 2004, CARNet Educational centre "Edupoint" started giving online lectures in different fields using WebCT. One, concentrated directly on satisfying designer needs is *"Creating online courses with WebCT"*. The duration of this advanced course is 4 weeks, it is tutor-led, and targets mostly current WebCT designers. Between November 2004 and January 2005, it has been run 2 times, for 3 groups of participants, with each group consisting of 10-15 participants. Since all the available "seats" in the online course were taken before the deadline, the course is considered a success, and will be continuously run in the future.

In the process of creating this and other two online courses, methodology experts and pedagogues were called to join the web design and multimedia production teams, and a version of the ADDIE model of instructional design, appropriate for the local CARNet context, was used.

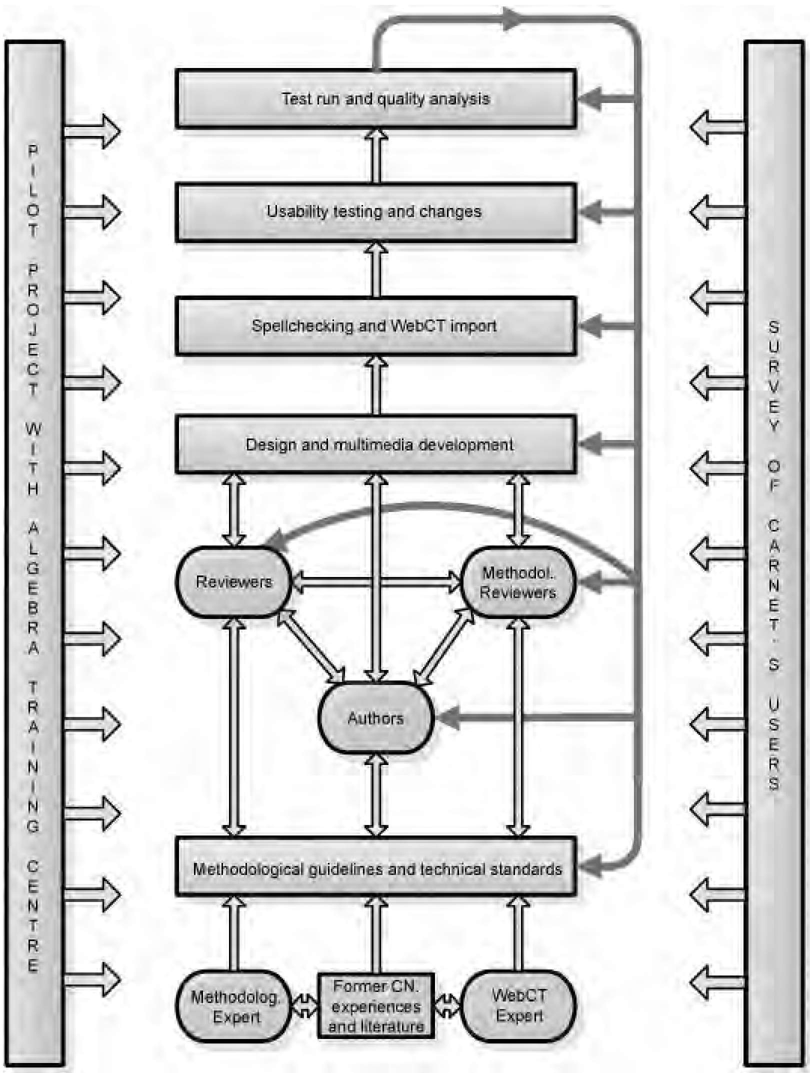

Figure 1. Version of the ADDIE model applied to the development of CARNet's online courses, G. Jugo, P. Jandric, 2004

Future challenges

Today, at the beginning of 2005, the number of online courses by designers in the academic community in Croatia is over 230, there are more then 250 registered designers and teaching assistants and more than 2500 students attending online courses. The numbers seem to be growing at exponential rate at the moment, doubling every 8-9 months.

To help user management, integration of CARNet's WebCT server with CARNet's *Radius/LDAP authorisation and authentication infrastructure (AAI) was* completed in recent weeks, enabling users to log in to WebCT using their existing dial-in usernames and passwords.

Since 2004, CARNet is in charge of providing ICT infrastructure not only for higher education institutions, but also primary and secondary schools in Croatia, which is expected to put further pressure to extend the e-learning infrastructure in relatively short time.

As this happens it becomes clear that the support team should grow, get specialised and be divided into smaller teams:

- technical infrastructure support team, responsible for the server, patches and backups;
- helpdesk team, responsible for the user and course management;
- course design team, responsible for instructional and course design help, tutoring online lectures and giving face-to-face workshops at the CARNet member institutions, on request;
- e-learning integration team, responsible for integrating universities' student information systems, institutions' content managements systems and e-libraries with CARNet's WebCT server.

The *integration of CARNet's WebCT server with other academic systems* seems crucial for the success of e-learning in the institutions of higher education in Croatia. Some of those systems include:

- the Student information system, in Croatia known under the name of "ISVU";
- content management systems of the member institutions;
- e-library systems;
- CARNet's and institutions' MoD (multimedia on demand) servers.

Since September 2004 to January 2005, CARNet's e-learning support team received three enquiries concerning the integration. The first one, integration of the content management system (CMS) of the Faculty of electrical engineering and computing (FER), University of Zagreb with CARNet's WebCT server was successfully finished in late December 2004. FER CMS runs Faculty's public Web and intranet infrastructure.

Integration with WebCT has been done in two ways: student database integration and teaching staff database integration. After logging in, FER CMS recognizes user as student or member of the teaching staff.

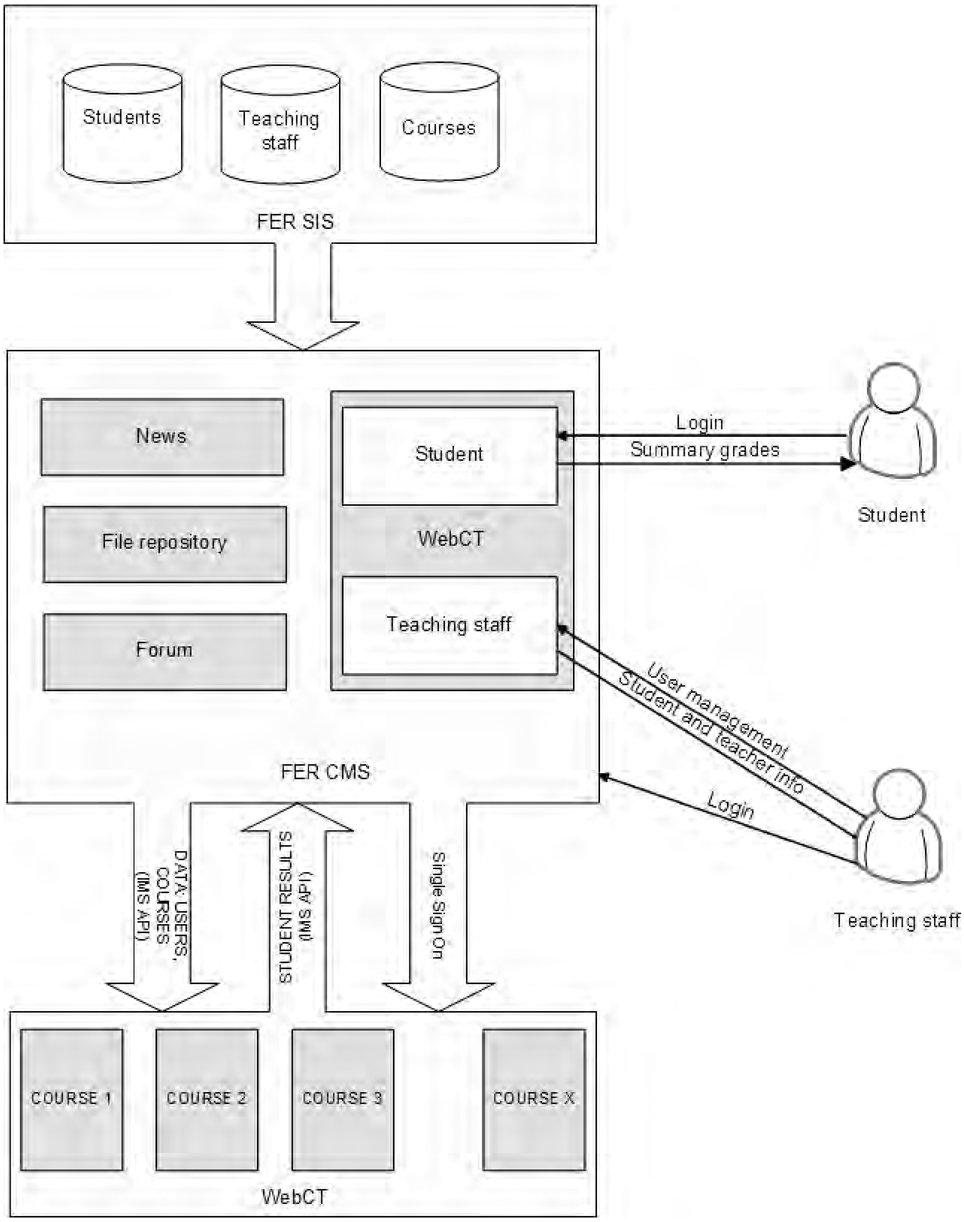

Figure 2. WebCT integration with the FER CMS and the Student information system

Students are presented with a module which enables them to access WebCT part of the course they are enrolled in, using existing methods of enrolment without the need for re-authentication and also to view results and information from all courses in one place.

Designers can add and delete assistants by simply selecting their names from the list of all teachers and assistants from their department, view student list, make final and midterm results publicly available on the FER CMS and contact local technical support. All these actions are done using custom made module which provides integration with WebCT using IMS API and WebCT API.

Technical support is integrated with the FER CMS. That way teaching staff members can ask questions via appropriate Web form, without the need to fill in personal information or re-authentication. The FER CMS automatically fills in all user information (name, phone number, email, etc.) so that contact with the teaching staff member can be established in the way technical support believes to be most appropriate for him or her.

The similar approach will be used in other institutions willing to integrate their existing systems and IT infrastructure with CARNet's WebCT server.

Conclusions

To optimally address various types of needs in further adoption of e-learning in Croatia, CARNet has undertaken various activities. Where once was a one-man support team, now there is support infrastructure, made out of different teams. The division in support tasks between technical and pedagogical becomes more visible. The offer of more advanced online and face-to-face e-learning workshops and courses becomes richer, as e-learning community in Croatia grows.

There are more and more academic teaching staff and students as well as teachers and pupils from primary and secondary schools, requiring more people in support teams, now divided into specialised groups. Demand from students for high quality educational materials has been addressed by introducing instructional and course design elements in workshops offered to teaching staff by CARNet. And finally, the need of institutions for integrated information and educational IT infrastructure has been addressed by efforts on integration of CARNet's WebCT server with institutional IT systems, such as student information systems, content management systems, e-libraries and media-on-demand servers.

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COLLABORATING INTERNATIONALLY TO MAKE CROATIA A KNOWLEDGE-BASED SOCIETY: REGIONAL IMPLICATIONS FOR E-LEARNING IN SOUTH-EASTERN EUROPE

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Introduction

Croatia has identified lifelong learning and reform of the education system, particularly higher education, as critical to its strategic goal of becoming a knowledge-based society and part of the European Research Area and European Higher Education Area. These are two initiatives that emerged from the Bologna Declaration on the European Space for Higher Education of 1999 (Office for Strategic Development of Republic of Croatia, 2002). This paper describes the development of the E-Learning Academy (ELA), a Croatian initiative that is designed to help achieve these goals.

The E-Learning Academy is being developed by a unique Canadian-Croatian collaboration that involves the Croatian Academic and Research Network (CARNet) and the University of British Columbia in Vancouver, Canada. CARNet is a government agency tasked with connecting the academic and research institutions to the Internet and promoting the use of the Internet in education and science in Croatia. It is a key element of the Croatian national strategy for turning Croatia into a knowledge-based society.

The E-Learning Academy consists of three online certificates in e-Learning:

- Management in e-learning,
- E-learning Tutoring,
- Course Design.

The certificates are aimed at developing Croatia's e-learning capacity and they are being developed in collaboration with the University of British Columbia, Distance Education & Technology (DE&T) and the Centre for Managing and Planning E-Learning (MAPLE).

The ELA and the Croatian and European Context of Higher Education

According to the most recent statistics, only about 13 percent of the Croatian working population has a higher education degree (Government of Croatia, 2002). This at the lower end of the European qualifications scale which is about 20% (European Commission, 2003). In addition, it takes longer than the European average to complete a higher education degree. (Government of Croatia, 2002).

In July of 2002 Croatia passed the Act on Scientific Activity and Higher Education that requires the country to observe European standards for higher education based on the Bologna process. (Office for Strategic Development of Republic of Croatia, 2002). The implications of this have been significant and have stimulated much needed reforms to the higher education system in Croatia. The Croatian reforms are closely related to the larger EU initiatives that began with the Bologna Declaration of 1999 which aims to create a Europe of Knowledge by reforming, coordinating and harmonizing the higher education systems of Europe. However, although there is a national consensus at the state, public and university level to undertake the educational reforms, the much-needed policies are still under construction leaving pioneers and other e-learning practitioners without national and institutional support.

A similar situation was reported by the European Commission which issued an interim report in November 2003 on this plan which concluded that, while all European countries had begun to adapt their education systems to the needs of the knowledge society, “the reforms undertaken are not up to the challenges and their current pace will not enable the Union to attain the objectives set” (Commission of European Communities, 2003, p. 3).

Evidence of this lack of progress can be seen in the development of e-learning in Croatia. Although this is part of the educational reforms in Croatia, it is still in the hand of the pioneers and early adopters, without major institutional support or the implementation of national policies. Still, Croatia is a leader in the south-eastern region of Europe in the investment into education, technology-supported teaching, the number of existing projects on the national and institutional level, as well as in the area of outstanding individual projects authored by professors and teachers, and future development plans. Evidence of this can be found in the European Training Foundation (ETF) report on the research on the use of technology-supported teaching in the Western Balkans region. This report covered Croatia, Bosnia and Herzegovina, Serbia and Montenegro, Macedonia and Albania. (ETF Newsletter – Number 5, 2005).

However, the other results of the ETF research provide a less optimistic image. In relation to national programs, especially legislative regulations, implementation of assessment criteria and strategic plans for the development of technology-supported education, the situation in Croatia and the rest of the examined region is equally challenging.

How the ELA Fits In

The E-Learning Academy is designed primarily to respond to Croatian needs for higher education reform. According to a World Bank report, “modernizing Croatia’s education system requires changing what is taught (curriculum), how it is taught (pedagogy) and the accountability of those at the point of service delivery for results” (World Bank, 2003, p.15). However, it is clear that the Croatian strategy for higher education and lifelong learning is driven also by the European initiatives. Croatia is working intensively to adapt its higher education system to meet the requirements of the Bologna process which will lead to the establishment of the European Area of Higher Education.

The main purpose of the ELA is to build Croatia’s internal capacity to develop and use e-learning. The ELA is aimed at higher education faculty and administrators and it focuses on three key areas where training needs have been identified: planning and management of e-learning, teaching in e-learning environments and developing e-learning courses and programs. Developing its e-learning capacity is part of Croatia’s strategic goal of reforming and modernizing higher education, broadening access and making more effective use of limited resources. As such, the ELA addresses not only the specific strategic goals identified by the Croatian government but the needs and goals identified by the various EU initiatives to reform European higher education. Specifically, the ELA is a step towards making higher education more widely accessible and to giving lifelong learning a higher priority. Both of these goals contribute to the larger goal of making Croatia (and Europe) a knowledge-based society.

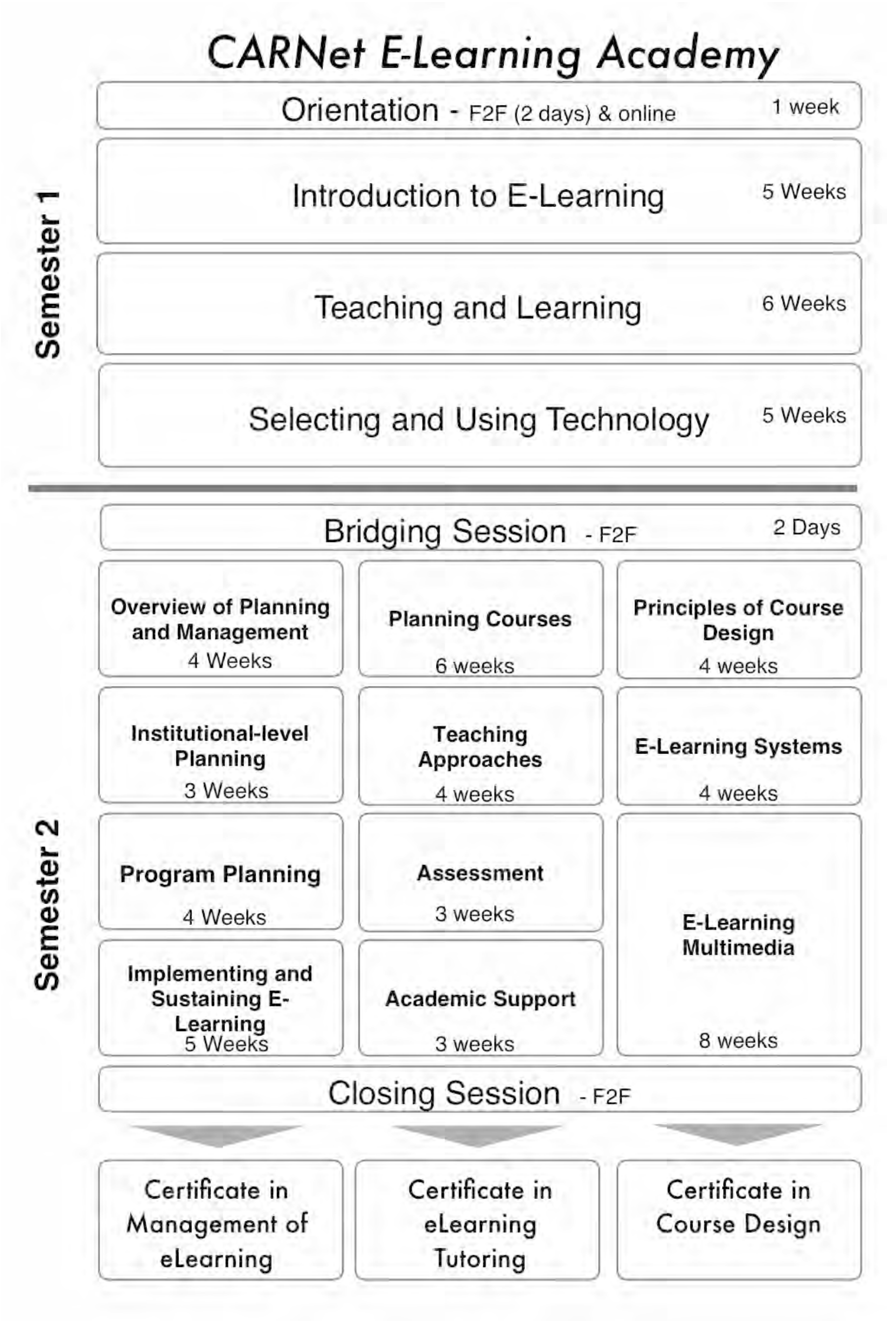
The goals of the ELA are also consistent with three of the four e-learning readiness criteria identified by the Economist magazine in its 2003 e-learning readiness rankings. The four criteria are capability, content, culture and connectivity. The E-learning Academy will help address the first three of these:

- Capability
  By developing Croatia’s *capability* to effectively organize its educational institutions to develop and deliver e-learning;
- Content
  With this capability Croatian educational institutions will then be positioned to develop the needed e-learning *content* in a variety of areas critical to the nation’s development;

- Culture
  This project is essentially about capacity building and once Croatians have the capability and the content they will have begun the process of changing the *culture* to one that embraces the use of learning technology to help reach national educational goals.

The ELA Curriculum and Structure

Each certificate in the ELA consists of two online semesters with a face-to-face orientation session at the beginning and a face-to-face bridging session between semesters. The first semester is common to all three certificates and consists of three modules that provide an overview of the field of e-learning, teaching and learning issues and technology selection issues. In the second semester the certificates focus on their specialty areas: planning and management, online tutoring, and course development. Participants can choose to take one, two, or all three of the certificates. Each certificate is offered over 34 weeks.



The Collaborative Process

The ELA is being developed by an international team that consists of representatives from CARNet and the University of British Columbia (UBC). CARNet has contracted with the Centre for Managing and Planning E-Learning (MAPLE) at UBC to provide instructional design, content development, web programming, multimedia development for the ELA. In addition, UBC staff have been contracted to tutor the first offering of each certificate. Croatian tutors will take over tutoring responsibilities in subsequent in offerings.

The syllabus for each certificate is developed by the international program development team and reviewed by a CARNet program review committee, and has been *approved through* international peer-review evaluation. Once the curriculum is approved, a UBC course development team begins the detailed development of each module. Module drafts are reviewed and approved by the CARNet program committee before development proceeds to the online stage.

Despite being developed by Canadian e-learning experts, the ELA is designed to meet the needs of Croatian educators. Each module draws extensively on Croatian cases to illustrate key concepts and issues. The teaching approach used takes into account Croatian norms and attitudes towards education and professional development. Several e-learning projects from Croatian higher education are presented as multimedia case studies. Video interviews were made with key players in the development of the Croatian academic and research network infrastructure, with key promoters of e-learning and also with pioneers in using multimedia and e-learning in the teaching and learning process. Those materials are supplemented with case narratives. The constructivist approach used is intended to help people apply theoretical issues to local challenges regarding e-learning in their institutions.

Most of the development of the ELA has been conducted at a distance with the UBC members of the team working in Canada and the CARNet members in Croatia. However, several face-to-face planning meetings have been held in both countries. In addition, technologies such as video conferencing, audio chat and e-mail are used extensively to maintain ongoing communication and dialogue.

Regional Implications

With research, promotion and teaching about methods, theories and best practice examples of e-learning application, the ELA will enable the development of experts in Croatia and the central and south-eastern European region who will stimulate and implement e-learning in their environment, paying attention to similarities to past educational systems and the present transitional political and technological context in the region.

At the moment, intensive planning for ELA program adaptation for countries in the region of Western Balkans, as well as regional ELA program offerings are being carried out. The regional project should initiate e-learning cooperation at the university level between the countries involved through education of managers, teachers and support staff. It should also show the possibilities and solutions for customization of the e-learning programs that should target the specific local needs for HE system reform and implementation of information and communication technology into education.

Conclusion

The E-learning Academy will move Croatia towards becoming a knowledge society. In this process three target groups – academic institutional managers, teachers and support staff – will create the force that will act on three levels to help the implementation of educational reforms and e-learning: the institutional level, the teaching level and the level of the production of e-learning materials.

The first program offering of the ELA in Croatian is planned for fall 2005. In 2006 there will be offerings both in English and Croatian.

The ELA programs will target not only Croatian citizens in Croatia and abroad, but also the citizens of countries of the Western Balkans region. Some of them can easily use and understand Croatian, which makes the idea of courses in Croatian even more attractive in this region.

As a part of regional offerings in the Western Balkans countries, the programs will be customized to meet the local needs. This regional project will support regional development and help the countries in the region even more to become a part of the European Research Area and European Higher Education Area as they approach the EU.

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THE ROLE OF ICT IN LIFELONG TEACHING AND LEARNING ENGLISH FOR TOURISM AT DISTANCE UNIVERSITIES

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Teaching and Learning Foreign Languages at the UNED

The *Universidad Nacional de Educación a Distancia* (UNED) in Spain, has always played an important social role, as since the 70s it has offered the possibility for anyone to acquire a university degree regardless of his or her physical condition, location, previous educational background or professional engagements. Many people living in distant areas enrolled in UNED courses to get the academic qualifications needed nowadays to fulfil competitive professional requirements. Other people who had not finished their high school studies or who had not taken the pre-university entrance exams, had the chance to get prepared and take an adult entrance test thanks to the UNED. In other cases, people with one or two degrees who wish to keep on studying could do so because the UNED combined further university studies well with their tight professional schedules.

More and more people follow the trend of continuously improving their knowledge of various subjects they consider important in life, such as computer science and foreign languages. Many students in the last decades have enrolled in extra-curricular courses which usually last one academic year and are open for everyone. Seeing the importance languages had in lifelong adult learning, the UNED opened three years ago a Language Institute called CUID, where most modern languages are taught, English especially, using the same "blended learning" system typical of the UNED.

In the 2001-2002 academic year UNED started offering Tourism studies with an enormous success, as more than 4,000 people enrolled in that first course. This large amount of students has remained virtually the same in the last two years. Most of the students attending Tourism studies already have a degree or work in Tourism related fields, so it is a good example of long life learning. One of the core subjects in the Tourism University Degree is English. Of course, students are required to have at least un upper-intermediate level of English when they decide to study Tourism at the university. There they will improve their written and oral skills and acquire vocabulary related with the Tourist industry, quite different sometimes from the so-called "general English".

The Challenge of Teaching English at Distance Universities

Foreign language being "alive" where importance of the oral skills is obvious for achieving real communication, it may seem an apparently difficult task to teach, or to learn, English at a Distance University.

In fact, it is challenging for both teachers and students of Tourism to tackle this subject in a motivating, and at the same time, effective way. Although some students are able to attend the "traditional" classes offered by the blended system the UNED has, with numerous study centres in Spain and around the world, ICTs have become the most powerful tool for achieving successful learning. As the Council of Europe recommended (1998), European educational authorities should take some measures regarding the learning and teaching of modern languages. Some of these measures are based on the application of communication and information technologies to disseminate teaching and learning materials for all European national or regional languages (1998, 2.5) and to facilitate lifelong language learning through the provision of appropriate resources (1998, 2.7).

The syllabus of the English Language subject at the UNED is designed having taken into account the characteristics of the students, the tools and resources available and the methodological approach recommended by the Common European Framework of Reference for Languages: learning, teaching assessment (2001), which defines the competences necessary for communication, the related knowledge and skills and the situations and domains of communication. The approach adopted by the CEF, is an action-oriented one in so far as it views users and learners of a language primarily as "social agents". This approach takes into account the cognitive, emotional and volitional resources and the full range of abilities specific to and applied by the individual as a social agent.

In the subject of the English Language, students have the choice of using a wide array of learning materials, according to their own learning style and needs. Some prefer "traditional" materials such as printed books and workbooks which are carefully designed for the distance learning (with keys, audio CDs, etc.). Others prefer taking advantage of the Web-CT and tackling the contents of the course, seeing their own record of achievement in order to carry out the tasks and activities required to deal with the communicative synchronic and asynchronic tools.

How to Teach English to Tourism Students Through ICTs

Teachers have to keep in mind that ICT are a means to achieve teaching but not a goal in themselves (Fonseca, 2003) as many people use them just for the sake of it, or because they are "fashionable" or easier, as the responsibility is put on the student.

ICTs offer an almost infinite array of possibilities of presentation, with different ways of expression both written and oral, combining visual and audio documents in an attractive way which permits students go to the place they like to go or they need to go, breaking the borders of the linearity of the printed traditional books. In addition ICTs are a part of the daily lives of many people, especially those students who had willingly and purposely enrolled in a Distance University. E-mails, discussion forums and chats have become very popular among students and teachers, as they help build closer ties than the ones which normally take place in a traditional class, where students are shy; they need an appointment to meet their tutor, etc.

The World Wide Web plays a key role in providing up-dated and attractive information. In the Tourism field, students can find more information about hotels, room types, restaurants, airlines, car rentals, resorts, monuments, history, etc., than in any tourism book. In addition, they have the "plus" of knowing that these facts obtained from the web are real, therefore useful in their future or current professional lives. Learning a foreign language has to be motivating, therefore, learning has to be significant for a student. He or she has to learn to work independently and autonomously to look for information which is relevant for him/her.

As the CEF indicates (2001) learning a language means that the students have to be involved in situations of communication, so that they train not only the communicative language competence, but also the so-called "General competences". These are for example:

- Declarative knowledge.
  - It comprises the knowledge of the world, especially of the countries where the language learnt is currently spoken. On the Web (Windeatt, 2000) we can find a large number of sites which provide all the information and the facts of every English speaking country. Data are automatically updated, and students can find out about the varieties of English spoken in countries where people do not often know it is an official language, such as Singapore. Those are some of the most useful sites the students of Tourism use to get information about the English speaking countries and their culture:

    http://193.170.42.81/cn/vs/english/links/culture.html
    http://www.jackolanterns.net/
    http://www.miguelmllop.com/projectwork/festivities.htm
    http://www.santalive.com/family.html Media
    http://193.170.42.81/cn/vs/english/links/culture.html
    http://www.usatoday.com/Countries
    http://www.great-britain.co.uk/
    http://www.americasbirthday.com/
    http://www.visitbritain.com/www.canada.com/CIA information about all countries
    http://www.cia.gov/cia/publications/factbook/geos/nz.html

- The sociocultural knowledge that is essential for the learners of English who will be (or already are) professionals of the tourist industry. They will have to know all about good manners at the table, the food and drink of many countries, how to deal with people from all over the world, the social conventions in every country, etc. Thanks to ITC they can not only "read" but also see and listen to how to greet people from different countries, and how to handle their business card without offending a potential customer.

- Skills and know how, which includes the professional knowledge.
- The existential competence is the sum of individual characteristics and the learners' view of others and his/her willingness to engage with other people in social interaction. This kind of competence is quite culture-related, so the more a person is exposed to different cultures; the more she or he will be flexible and open towards other cultures and languages. The Web and the communication tools it offers are a precious way of achieving communication among people from all over the world, with completely different cultures, religions, languages, ages, interests, but who can express their points of view and tell about their countries and cultures, and at the same time learn about others and all mutual respect.
- The ability to learn involves the rest of the competences as the learner has to know the world where the language is spoken and keep the right register and body language, keeping the necessary rituals, using a dictionary when needed or finding the necessary information at a resource centre or on the Internet. It has to do with learning styles. Fortunately ICTs are different and flexible enough to suit almost all learning styles. Some students like to learn in a holistic way, while others are more analytical, some are field dependent and need rules while others are independent and like to plan their own learning it their own way and whenever they like. Thanks to the internet and interactive multimedia materials all kind of students have a learning opportunity. With the programs and courses which are displayed on the Web, or the interactive CDs they work with, the shy students can practise alone without being annoyed by their classmates (faster or slower than them) and without feeling bad in front of the teacher.
  - As the computer has got infinite patience, the student can sit in front of the screen and repeat something as many times as he or she needs until he/she learns it properly. In addition, students can use the computer whenever they need it, so it promotes flexible learning. This is very important especially for ESP students who are adults that are already working and do not have time to attend regular language classes. They also like to have a complete and planned progress system, selected exercises with self-assessment and feedback (Brierley and Kemble, 1991).
  - At distance universities lectures have to deal with large classes, they need to use ICTs to deliver the contents and keep record of the students achievements and problems. The teachers negotiate at the beginning of every year the way the contents have to be studied. Each student has the choice to work alone, in pairs, small groups or large groups, from the distance or meeting from time to time, keeping written contact with the rest, or just phoning the teacher from time to time. Students can use books, the Web or CD-Roms to train the English written and oral skills they will need to work in the Tourist Industry.
  - There are two main types of multimedia courses found mainly as CD-Roms and in the Internet. CD-Roms are self-contained products which have the advantage of being designed for a specific purpose, while the resources you can find in the internet is not so well organized and therefore is more time consuming and variable. However, the Internet is free and always updated, while a CD-Rom can be old-fashioned in a few years. Many teachers produce their own interactive materials with the free educational software provided in the web. Thanks to technologies, this task has been easier, as there are many resources available in the internet to design tests and exercises, as malted (www.malted.ort), click (www.click.com) or the very popular hot potatoes (www.uvi.ca).

– All multimedia need an evaluation (Clarke, 1989) to check up if they are worth working with them or if on the contrary, it is better and less time-consuming to study certain aspects with the help of a book. Pedagogical, functional and technical criteria have to be taken into account whenever a teacher decides to use a specific CD-ROM in his/her classroom (Squires and McDougall, 1997).

Syllabus Design

The first year of the English Language in Tourism Studies at the UNED deals with the following topics:

- Types of Tourism
- Transportation
- At the hotel
- At the restaurant
- Ecological and sustainable Tourism
- Cultural tourism
- Written communication in Tourism
- Oral communication in Tourism
- Job hunting

Every topic is thoroughly studied from various points of view which includes the study of communicative situations, communicative functions and notions, grammar in context, phonetics, vocabulary, culture and civilisation, reading, writing and speaking interaction and mediation. Basic information and minimum standards are displayed in the contents module of the WebCT, but studens feel free and look for the information they feel they need. On the other hand, they can find a large variety of exercises on the Web, to practise and assess almost every topic involved in the English class.

Listening comprehension exercises:

http://els.about.com/library/courses/blcourses_beginer_listening.htm
http://www.englishlistening.com/theory.phtml11

Listening to songs and dictations are also good ways to practise listening:

www.mp3.com
http://es.search.mp3.com/bin/search?query=elton%20john%2FDaniel&submit=Buscar
http://www.esl-lounge.com/songstop.html
http://www.bhg.com/home/Christmas-Carols.html
www.karaokekanta.com
www.sun80s.com/ly.htm
www.clssicalarchives.com
www.midifarm.com/files/
www.songsss.com
http://www.esl-lounge.com/pronunciation/prondictarace.html

Speaking seems to be the more neglected skills by the ICTs. However on the Web there are abundant sites very useful and motivating for practising oral interaction, oral production and oral mediation. Some of those are:

Net Meeting:
www.microsoft.fl.com/windows/netmeeting/default.asp
Phonetics:
http://www.learnenglish.de/Level1/Pronunciation/phoneticpage.htm
http://madang.ajou.ac.kr/~moon/phonetics-02f.htm
http://ead.univ-angers.fr/~menan/cerel/english/phonetics/english_phonetics.htm
http://www.phon.ucl.ac.uk/home/johnm/eptotd/tiphome.htm
http://www.btinternet.com/~eptotd/vm/soundmachines.htm
http://www.btinternet.com/~eptotd/vm/vowelmachine/vowelmachine.htm

Pronunciation games – dominoes:

http://www.esllounge.com/pronunciation/prondominoes_ooo_oo_ow.html

Exercises:

http://eleaston.com/speaking.html#act

Apart from these sites, teachers and students can record their own voices in the computer with the build-in microphone and leave oral messages files in their teachers or mates mails. At the UNED, videoconferencing is used once or twice a month, although it still does not offer stunning results due to the technical limitations.

Students have to take two tests a year which will measure their ability coping with a real text (catalogue) and a real task (playing a role in a communicative situation). They will have to work in a collaborative way with other students as they have to produce a final project which will be chosen among a large number of them. The aim of project working is make the students responsible for their own learning, get to know each others in building support and study groups from the very beginning, make them look for sources of information, select this information and process it so that it is useful for their research.

Up to now this apparently “free” and open system to teach languages has worked very well for both teachers and students. We wonder if this methodology used in a distance context could be successfully transferred to a “normal” learning environment which takes place in non-distance universities.

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USING E-LEARNING IN THE DIAGNOSIS RELATED GROUP (DRG) SYSTEM IN THE CZECH REPUBLIC

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The Institute is a public organisation that mainly focuses on the postgraduate education of doctors, pharmacists and other professionals in the health service. The education is managed in two directions; on one hand it is the support of achievement of the professional qualification for work, and the other it focuses on the lifetime education area. The School of Public Health was open on the premises of the Institute in 1993. Among others it deals with issues of the management, information systems, healthcare social aspects etc.

The inseparable part of Institute's activities is a solution to significant research grants, projects implementation, healthcare analyses and creation of conceptual materials. The Institute became responsible for the realisation of a DRG (Diagnosis Related Group) pilot project implementation in the Czech Republic in 2002. DRG is a statistical classification system that categorizes the in-patients into specific groups according to diagnoses, key medical procedures and economic costs. A number of countries already apply these systems to the hospital management and they are generally also used in the health care finance systems.

The DRG system introduces a new quality into the hospitals management and undoubtedly requires changes to work of a whole number of employees within the healthcare system. As the system classifies the patients into specific groups, it requires that all the hospital doctors, medium and top healthcare management, informatics engineers and other employees get at least familiar with it. Indeed, knowledge of this system is also essential for the majority of employees of medical insurance company employees.

It is obvious that implementation of DRG system into the in-patient care is conditioned on educating of an extensive professionally structured group of employees, which is why a significant part of capacities was focused on education in this area already in the pilot operation of the project.

The management of Institute outlined as one of its strategic goals to innovate the educational methods and organisation adequately to the requirements of the aspects of distance education already few years ago. This is why during the past years the Institute has been operating the project in cooperation with specialised companies with the aim to identify how to implement e-learning into its educational activities.

Adequate conditions for the distance education were created in the area of elementary requirements, mainly with regards to IT availability, the skills to work with it and an Internet connection, likewise for both the potential participants of the e-learning education and the Institute. At present, adequate technical capacities for the management of e-learning education system has also been put in place.

The implementation of innovation into a relatively well-established institution always brings a number of problems. It is necessary to motivate the staff and evoke interest in using of new methods interesting. With regards to this, the area of DRG implementation seemed to be a fitting opportunity to test the likelihood of the implementation of e-learning programs into teaching, also because it includes a complex of new activities mainly connected with new people, and there is no need to overcome any significant long-term stereotypes.

For these reasons the Institute's management decided to focus the implementation of e-learning pilot project on the DRG area. At the same time it was decided that education should combine e-learning with the classical attendance education.

Following the initial project and its review a pilot project was developed. It consisted of the following realisation stages:

1. Development of the process analyses and the project team nomination;
2. Creation of the education methodology and models;
3. Training of the project and authors team;
4. Approval process;
5. Handover of study materials to be transformed into the e-learning form;
6. Pilot testing;
7. Evaluation;
8. Normal operation.

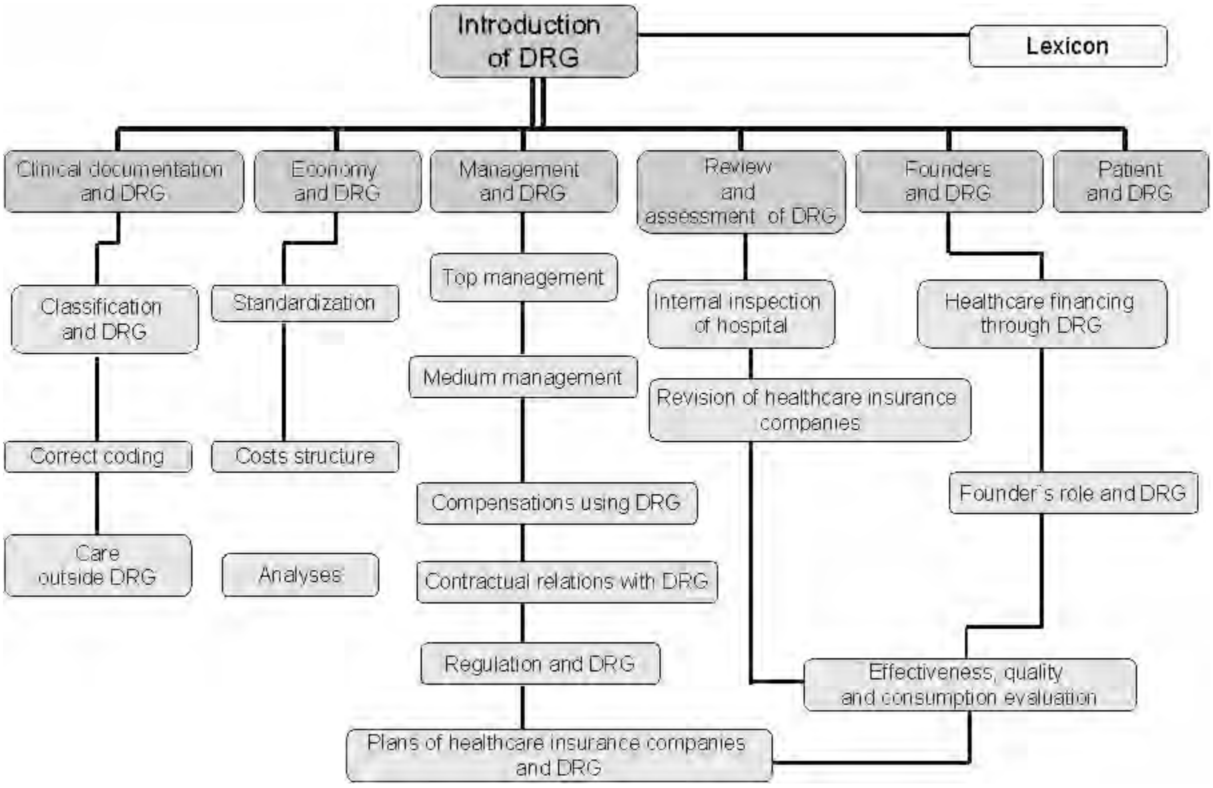
The key moment for the pilot project realisation was the creation of a project team and teaching its members to cooperate as a team. The basic roles of its members (or groups) demonstrate their professional heterogeneity:

- Authors
- A methodologist
- A graphic designer
- An executive editor
- Reviewers
- Editorial board
- An administrator
- A course manager

The project realisation was not problems-free. The creation of a project team was the fundamental issue. A requirement for changes came up in the course of the realisation, as some members were external collaborators with limited time capacities. Indeed, the teamwork was linked to the motivation of its members, which was far from the mere financial appreciation and it was therefore necessary to identify also different factors (social appraisal, communication with Czech as well as foreign professionals, creation of an independent department etc.).

In contrast to “classic” study materials, where longer descriptions can be used where necessary, text for e-learning is briefer. For this reason, an imperative need to use uniform terminology soon became apparent. Thus a lexicon of basic terms became part of the preparation procedure for e-learning texts. Terms are added to the lexicon on the basis of mutual commentary and the decision of the editorial board. Terms are added to the lexicon on an ongoing basis, however revisions are to be carried out with a minimum two-year periodicity in the interests of maintaining certain stability.

The entire project has a relatively complex internal structure because of the diversity of target study groups (see the chart below):



The first hierarchical level is a joint introduction to DRG. This is a fully electronic course. At the second level, we have specialised topics based on the roles carried out by participants or rather roles they will be carrying out in the DRG system. Here, the course is a combination of the electronic and presentation form of study.

The presentation form of study is important for personal contact between participants and lecturers, as well as mutual contact between participants. The mutual exchange of information on problems with DRG implementation in individual organisations is very important for the progress of concrete participants. At the same time however, previous preparation in electronic form enables qualified discussion that focuses more on topics. We feel that a combination of electronic and presentation forms of study is increasingly important according to the degree to which education leads to innovation implementation.

The inexperience of authors with development of tests on the multimedia level was also among the more significant problems.

Nevertheless, despite the above-stated problems we would like to say on the whole the first reaction to the application of e-learning methods in this specific area was a positive one. We believe the main contributions to be:

- Option of an individual choice of program, time and place of study;
- Self-evaluation by assessment tests after individual topics;
- Electronic communication with tutors with more rapid response than in case of the usual set-date personal consultation.

From the perspective of the organisation organising e-learning education, experience to date has shown the need to:

- systematically build a circle of authors in fields covered by the institute;
- develop teamwork methods;

- devote more attention to questions of terminology;
- systematically monitor e-learning development;
- market e-learning activities.

Thus, our first experience with a nationwide system of e-learning education is positive and we believe that we shall apply this method more frequently and also in other areas of the postgraduate and lifetime education (for instance in the area of urgent medicine, medical law or general practitioners education).

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OPEN EDUCATIONAL SOLUTION FOR SPECIAL NEEDS CHILDREN

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Summary

Distance education – the universal form of training based on the use of a wide spectrum of traditional, new information and telecommunication technologies, which aims to create conditions for a child to make a free choice of the educational disciplines corresponding to standards, dialogue exchange with the teacher, thus process of training does not depend on an arrangement of pupil in space and in time.

Centre of Information Technologies and Learning Environment is a state institution of the Department of Education of the Moscow City Government involved in a process of improving the standards of the educational system in Moscow, particularly with respect to children with special needs.

The paper outlines an on-going project of distant and open education for more then one thousand children with special needs in Moscow. It discusses major aspects of the approach taken and major problems with its implementation. Examples and illustrations will be presented at the conference.

The Moscow Home School

Children

The project we discuss serves the needs of children of Moscow that cannot visit school because of their physical conditions (including movement limitations, diabetes, asthma, etc.). Today we have more then 1000 of such pupils in our school, learning at homes. Their ages are 6 – 18 (1 – 11 grades). Most of the children are 'associated' with state schools, but the schools usually cannot provide level of teaching good enough to motivate children and their families for study and generate confidence in the child's future.

Teachers and others

The school personnel are constituted by:

- 189 teachers of all subjects working using distance learning system, sometimes e-mail, and, occasionally, via live video, phone, and personal contacts; some 15 of them supervise other teachers of their subject;
- 20 technical instructors are students and former students of a technology college. They provide initial training for pupils and their relatives, consultancy and trouble-shooting afterwards;
- 12 administrators, programmers, etc.

Technology

Hardware

Every pupil has:

- e-book computer. These Apple note-books were chosen because of their robustness and reliability and, particularly virus- and game-safety;
- e-sight web-camera;
- laser printer;

- scanner;
- graphical tablet;
- digital microscope;
- digital sensors (temperature, light, pH, angle, pressure);
- RoboLab – LEGO kit (bricks, mechanical pieces, motors, lights, microcomputer, IR-interface);
- Besides that, there is a stock of equipment available on demand: digital cameras, digital video cameras, MIDI musical keyboards.

Software

- Microsoft Office;
- Apple bundles: e-movie, e-photo, Garage band;
- Virtual PC;
- Moodle virtual learning environment (Fle3 is used also);
- Virtual laboratories in Russian: IconLogo, Microworlds, Geometer's Sketchpad, Interactive Physics, Family tree;
- Collections of images in biology, arts, etc.;
- Rew@rd: English-language learning environment;
- Specialized tutoring software for math;
- Professional tools for web-design, programming, CAD, DTP, etc.

Educational system, school site

Remote system of training and management of school is composed of:

- the automated system of application for courses and the account of the sent applications – own development;
- electronic system of the reporting (network log-books of individual work of teachers with children) – own development;
- a control system of educational process – translated into Russian and adapted under features of the project educational environment MOODLE – Open Source;
- the educational environment for the organization of design activity – educational environment Fle3 Open Source translated into Russian;

and places on a school server (www.home-edu.ru).

The site realizes the following functions:

- general information on the project;
- necessary contact information;
- personnel and pupils data base and tools of dispatch (the general, to the teachers, to the pupils);
- data base of courses (more than 150 modules) and the automated system of application for courses,
- platform for allocation of educational, methodical materials, works of pupils;
- platform for placement of personal pages of participants of the project and contains tools on their creation;
- participants of the project (depending on degrees of the admission) the necessary information on teachers and pupils, on conditions of application for courses, on online-researches, etc.;
- opportunities of the communications: by means of the guest book (for external users), internal mail, chats and forums (for participants of the project).

Communication

All pupils are provided with an ADSL-line. Besides its broad-band quality it has an important feature of not-interfering with telephone communication via the same wires at the same time.

Financing

The work of the school is financed by the Moscow City Government from a special grant.

Organisation

The school today is a part of the Centre of Information Technologies and Learning Environments. The Centre is the organisation responsible for providing all types of equipment and digital resources for all Moscow schools and support of their use.

The goals and the curricula structure

Our efforts are aimed for:

- Personalizing learning for children with SEN (special educational needs);
- Involving children and young people with SEN in decision making;
- Improving opportunities for progression beyond school for young people with learning difficulties and disabilities;
- Improving specialist advice and support for special schools;
- Making better use of information on how well children with SEN are progressing in school.

The school, realizing the purposes and problems of the state educational establishment, simultaneously solves also special problems of correctional character, providing training, development and social adaptation in a society of pupils with problems. Training at school is carried out individually and in groups up to 8 pupils. Forms are determined by features of training and according to medical parameters.

The individual priorities

The conditions of life and study as well as psychological constitution of learners enforce variable systems of priorities for different pupils. For many of them major priorities are:

- Self-esteem, realization, socialization;
- Professional choice and professional preparation;
- Job training.

The general education for these students appears as a tool to achieve their personal needs characterized by priorities mentioned. Other students (and, usually, their families) consider general education and continuation of education as the super-value and the ultimate goal. So, the school and the head-teacher structure curriculum individually.

For example, for some students a course in programming or in a handicraft can be the origin of real learning. Another typical example is a foreign language emphasis: we have students in our school that receive top awards in creative translation competitions (by British Council, etc.).

Psychological and social support

- Development of diagnostic toolkit for revealing levels of intellectual development of pupils, a level of development of impellent skills and a motility with a view of their correction.
- Elaboration of individual programs of education, development, social adaptation of pupils.
- Psychological consultation of children, parents, teachers.

Group work, cooperative learning, and reflection

The importance of social context for productive learning was discovered and investigated by L. Vygotsky. In our situation social interaction can really be the critical factor for an individual's learning path. This means that cooperative projects are a cornerstone for the school.

We support also all kinds of learning reflection and self-evaluation.

Further education

For the pupils continuing their education after finishing the school an adaptation period for the new learning situation is needed. It is provided before and after entering higher education in cooperation with several higher education institutions (included specialisation in arts, programming, and foreign languages).

The cooperation extends to developing of joint space for distance education as well as help in preparation of the professors of the universities for the new teaching methods.

Open education

So, our school implements the model of open learning and uses ICT for it. It provides a lot of individual opportunities and connections.

Problems of teaching and learning

Teaching is conducted under individual curricula and programs using the adapted state programs on all subject domains, author's programs and courses in subjects and design activity.

All teachers and administration of school have had training preparation on use of the automated control system by educational process in the virtual school environment (electronic document circulation, electronic journal of progress, creation and storage of teaching materials, creation of electronic libraries, creation of a portfolio of each pupil, etc.).

Written communication

Writing is the major tool for communication in the school. Two levels of problems are associated with this:

- Technical problems of learning fast (e. g. touch-) typing and text-processing
- Pedagogical problems of adaptation of teaching and learning methods to this limited form of communication

We are still very far from any final solution of this problem.

Teacher training

Written communication is only one example of a technological-educational skill to be formed in the project. Our teachers receive broad training that includes technological aspects as well as educational ones. They should learn how to look after their students' and their own work 'from aside', and how to plan their work with a student and the student's learning path.

This training is happening today not systematic enough, mostly as trouble-shooting and coaching embedded into the process of teaching.

There are numerous other problems as: evaluation and assessment, hardware loses, etc.

Future development

In the technological sense we would like to establish a call-centre to support fast reaction of teachers and IP-telephony.

In the educational sense we are seeking for tools for teachers to optimize individual learning trajectories.

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DEAFVOC – CHANCES FOR THE DEAF IN VOCATIONAL TRAINING VIA DISTANCE EDUCATION

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1. Introduction

1.1 The project

DEAFVOC (Sign Language and European Written Languages in the Virtual Vocational Training of the Deaf)[1] is a Leonardo da Vinci language competence project, funded by the European Commission. It started in October 2003 and will last for September 2006. The aim of the project is to develop material for teaching sign language as well as for written/spoken language for vocational training on an ICT-basis with sign language as language of instruction. Distance learning gives the chance to produce sign language oriented material and to spread it to all interested people. Such a net-service will help to overcome some financial and time resource problems we face in working on deaf education.

1.2 The target group

The target group of DEAFVOC are sign language users (mostly deaf people; for a definition of an open community cf. [1]) in contrast to the majority of the hearing impaired. While many of the hard of hearing people only demand adequate hearing aids in order to amplify acoustic phenomena, the acoustic channel is barred to the deaf so that all acoustic data have to be presented in a visual form in order to be accessible. This is also true for spoken language. As there are problems with or restrictions on the use of written language, most of the deaf choose sign language as their preferred language[2].

2. Outcomes / products of DEAFVOC

- Survey Report on vocational training of the deaf in Europe
- Standard Model Curricula – “Sign Language as a Mother Tongue” and “Written Language as a Second Language for the Deaf”
- Teacher’s Guides
- Demo teaching material
- Experimental teaching, report
- Transnational trainee course for teachers of the deaf how to use curricula and teaching material

The survey report [2] has been already finished and analyses the general situation of the vocational training of the deaf in Europe (23 countries) and especially the sector of language teaching. It is a systematic collection of information on the linguistic difficulties of the deaf in Europe and the consequences for the deaf when they try to access and complete vocational training. It can be found at the project website www.deafvoc.fi.

[1] Contractor is The Finnish Association of the Deaf. Partners are: Centre for Sign Language and Deaf Communication at Klagenfurt University (Austria), Czech Moravian Unity of the Deaf Research (Czech Republic), National Board of Education in Finland, The Aura Institute (Finland), Western Greece Development Center (Greece). Evaluator: Bertold Fuchs, The Department of Languages of the Jyväskylä University (Finland).

[2] In the case of deaf-blindness both channels, the acoustic and the visual one, are barred and language has to be learned via the tactile channel (sometimes in combination with residual abilities in the other two channels). Here a system of tactile perception of a sign language is recommended, accompanied by written language in tactile form.

Equal access to education and equal opportunities on the labour market imply equal rights for deaf people. As the findings of the survey show, this is not the case in many European countries.

3. The state of deaf education

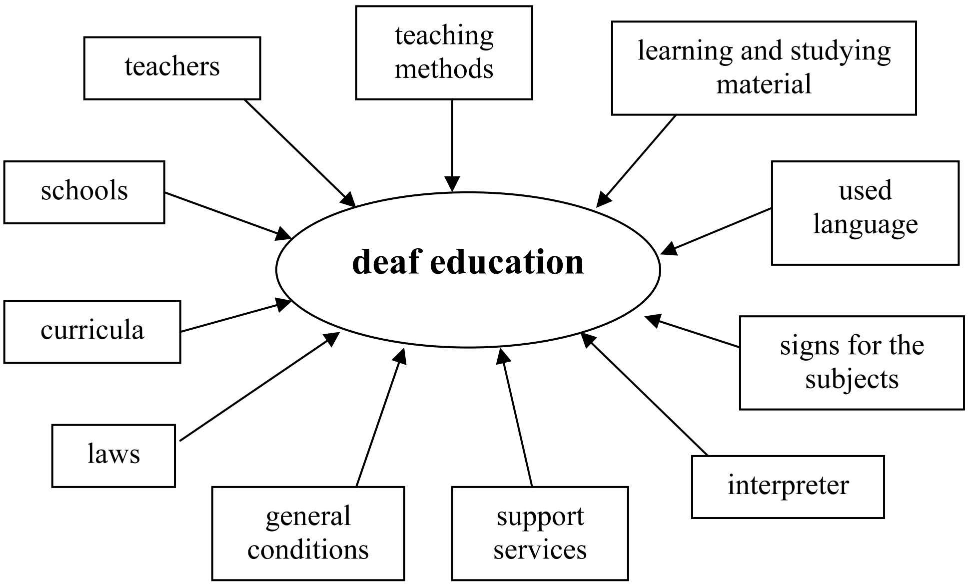
3.1 The "language problem" of the deaf

The lack of competence in a written language [3] and in general education are the major obstacles for many deaf people aiming at further education and training. The time dedicated to reading and writing at school is usually not sufficient for a qualified vocational training. As a consequence of insufficient written language and poor study skills, they are in danger to be discriminated in education and on the labour market.

In order to include deaf people adequately it is important to have a deaf-specific bilingual education at all levels. Sign language[3] is of special importance as a primary language of instruction. It is only possible to learn a new language, if you can fall back on a fully developed language system. Beside sign language the deaf also need good skills in spoken and written language of their own country to succeed in their studies and in the working environment.

3.2 Factors influencing deaf education

The education of the deaf depends on a couple of related factors. These are for example (cf. Figure):



- schools (special schools or mainstream);
- teachers and their training and language (deaf teachers with SL as a mother tongue, hearing teachers with SL, oral education, in Austria deaf people are allowed to attend schools to become a teacher, but they are not allowed to work as teachers with the same rights as hearing people);
- curricula (Are there special curricula for the education of the deaf? SL as a mother tongue, written language as a second language?);
- signs for the subjects (grammar, technology, standardisation, dictionary);
- used language – possibility to use SL as a study language (SL or sign supported language);

[3] Sign language is not a universal language. Every country has its own sign language. Nowadays more and more European countries recognise sign language as a mother tongue of the deaf and the sign language community as a linguistic minority.

- laws (Does the legislation make it easier or harder to attend vocational training? What about the SL recognition?);
- teaching methods;
- teaching and studying material; Are they understandable? Versions: paper, digital videos?;
- interpreters and their training and special knowledge, e.g. foreign languages;
- support in the education of the deaf, e.g. pre-training (improve study skills, basic knowledge), learning support;
- general conditions as social and personal background (parental home and support of parents, additional disorders).

Deaf education in general should not focus exclusively on school and vocational education, but should start with specific information for parents of deaf children and early intervention and then go on to the respective adult education.

3.3 The educational position of DEAFVOC

The DEAFVOC consortium is convinced that a consequent bilingual education at all levels could improve the situation of deaf people. Therefore the starting point of the development of curricula and study material for language teaching is that sign language as either the preferred language or the mother tongue of the deaf is the language of instruction.

3.4 The situation at the point of entering the labour market

When entering the labour market, the deficits of deaf and severely hearing-impaired people in language, communication skills and knowledge are sometimes already so grave that they present a big obstacle for entering an employment situation (e.g. if a spoken-language oriented test results in an IQ of 70). Poor school achievements and low-level qualifications result in either unqualified employment relationships or in the entering of an apprenticeship for a traditional "deaf profession" such as tailor, carpenter, shoemaker, locksmith[4]. At the transition from school to vocation, it is also almost too late to compensate economically for what has been missed during school days. If someone manages to go on to higher education, they do so because of time-consuming personal commitment, which presupposes a strong self-confidence.

Deaf people cannot be held responsible for their low performances, e.g. in written language, or for their low standard of information resulting from this. In contrast, the inadequate teaching methods and measures must be stated as the cause. Beside the serious reduction of life chances, this situation sometimes leads to a low self-esteem and psychological problems. In order to reach an educational level comparable to that of hearing people, deaf people need to be given the opportunity to use sign language from the beginning.

If the pre-vocational education were better in more European countries (positive examples are e.g. the Scandinavian countries), the transition from school to employment would prove less complicated and the dependency on support and guidance would be less high.

4. Why distance education for deaf people?

Deaf sign language users are in the situation of an extremely spread linguistic minority and there is few adequate material, especially for vocational education or lifelong learning. Additionally, the competences of deaf people vary individually over a large range. Therefore ICT-solutions which use the full range of new media have the following advantages (for a detailed discussion cf. [4]):

[4] E.g. in Austria, about half of the deaf and a third of the hearing have finished an apprenticeship. Many of the deaf, however, do not work in the profession they have learned, but only as unskilled labour. As for higher education or graduation from university, there are very few deaf people (1%) in comparison with hearing people (6,6%).

- If programmed in an open manner, their structure (and partially contents) can be exchanged between several cooperating partners and be reused for related tasks.
- They are neutral with respect to their use in a presence or distance course.
- Even if thought for course use only, some members of the target group may use the material individually via the Internet, CD-ROM or DVD. So the open presentation can motivate several people to start new learning initiatives.

5. Elements of distance education in DEAFVOC

Based on the information collected in the afore-mentioned survey report, the standard models for curricula and teaching material for the target languages are now developed. Especially the Finnish partners in DEAFVOC can already show samples of distance education for deaf people. The curricula should instigate the discussion on European standards in deaf vocational education. The demo material produced should also motivate the discussion on structural and technical standards of educational ICT-material for this target group. The features will include the possibility of use of all material in distance education. Several examples of material as well as tools for the production of material will be presented at the conference in Helsinki.

6. Conclusion

The deaf are handicapped only by their "language problem" which consists in the hearing societies' (partial) ignorance of the necessity of bilingual communication. Though the last decade brought a considerable improvement in the perception of deaf needs in many countries, still a huge amount of work remains to be done, especially on the global level. To give only one example: In order to improve the situation for all sign language users, the education and employment of deaf teachers, tutors and sign language interpreters (sign language to written language and vice versa) not only in vocational education is an important political issue for the future. There are already successful examples (especially in the Scandinavian countries, the USA and the United Kingdom).

We hope that within DEAFVOC we can producee some examples how equal educational opportunities for the deaf should look like. We would highly appreciate if the authorities of many countries were interested in the improvement of the education of the deaf, because educational opportunities are life opportunities.

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MULTIPLE METHODS FOR COUNTERACTING MARGINALISATION OF RURAL COMMUNITIES IN THE GLOBAL, KNOWLEDGE-BASED, NETWORKED SOCIETY

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Introduction

More collective and comprehensive approaches must be taken in order to ensure districts have the opportunity for active, successful participation in a society which emphasizes lifelong learning. Without such a perspective – and with lack of policy in this area – further marginalisation of rural regions may occur in the modern, global knowledge-based, networked society. This was the starting point when we began working with the Midt i Norden (MIN) network, which we will present here.

We will attempt to explain why we consider it important to think diversity when working with lifelong learning. In the first section our fundamental ideas on lifelong learning in the district are presented. Furthermore, some trends are introduced – national and international – which influence lifelong learning in various ways from a rural perspective. Suggestions for strategies and policy to counteract marginalisation of rural areas, when it comes to skills development and participation in the global knowledge-based networked society are then presented. Finally, we present the actual network. In autumn 2003, MIN was designated a Norwegian national lighthouse project by Høykom/The Research Council of Norway (see: www.hoykom.no).

How is our surrounding?

Lifelong learning has long been high up on the European agenda. It is now a key concept in the new generation of "integrated educational and training programmes of the European Union in 2007-2013". In Norway this topic continues to be an important priority area.

During the past decade, terms such as knowledge-based society, globalisation, marginalisation, technical revolution and network society have been featured regulars in the social debate.

The American researcher Castells has gone so far as to say "different tempos of access to technical property/capabilities are a central cause of failing equality between people, countries and regions" (Castells p.45). Many will say the same about knowledge and the access to it. This is one of the reasons that broadband is increasingly built out to the districts. Information and Communication Technology (IKT) has been given priority in education and political strategies for technological development and research have been developed in Norway. As concerns education, Norway is commited to keeping up with international advances in technology for distribution and access to knowledge.

Lifelong learning and technological development's becoming priority areas is a consequence of large, complex international trends. In April 1999, there was a public dialogue in Washington, D.C.. Bill Clinton, Tony Blair, Gerhard Schroeder, Wim Kok and Massimo D'Alema were present. There was overwhelming agreement on the thoughts behind the third way (strategy for work within the social community sector). The Scandinavian welfare states were highlighted and the conclusion was that it was no longer enough that people were protected by the government but that there is an acute need for placing responsibilty in the hands of citizens themselves. It was further said that authorities should engage in empowering individuals. Italy's prime minister said that the third way suggests that it is possible to combine social solidarity with dynamic economics. To achieve this we need less national governing, less centralized control, but more control over local processes while simultaneously ensuring open access to the global community. Economic development will demand lifelong learning and adaptation to the knowledge-based economy (Giddens, 2000).

Castells encourages us to take this technique seriously and to use it as a starting point. He requests that we place this process of technological revolutionary change into the social context already in progress and by which it is formed, and he reminds us that the search for social identity is just as strong a force as the technological-economic change when we observe recent history.

Furthermore, Castells points out that the information technology revolution is, since it permeates all human activity, the basis for his analysis of the complexity in the economy, the society and the culture which is under development. By this he does not mean that it is so simple that new social forms and processes arise as a result of technological changes. It is not technology which decides which type of society, nor the reverse. *There are many factors, to include among other things human ingenuity and enterprise. The end result depends on a complex model of interaction* (Castells, p.19). At MIN we have taken up this challenge, which is a complex approach to give support to innovative local communities which are still evolving.

At Midt i Norden (MIN) we believe that ownership of the learning process should be placed in local hands. This is contrary to Norwegian law. State funds for higher education are transferred to central educational institutions. Students who commute or settle in the cities receive much more governmental support than those with the need to learn where they live and work – in the districts. Traditionally, educational institutions have not provided equivalent funding for students out in the districts. Continuing – and further education must be totally financed by students or their employers, and it must be a source of income for the educational institutions. This is an example of how we are faced with many complex challenges all at once in order to organise for lifelong learning.

As a counterforce to a future marginalisation of inhabitants in Norway's districts, we have formed a separate district strategy where we see that exclusion from a sophisticated knowledge system is responsible for several types of suppression. Increasing awareness is fundamental for avoiding marginalisation. The most marginalised groups are those which today are (besides economic exclusion) excluded from the "knowledge-based society" due to suppressive pedagogy, through institutionalising and centralising of knowledge – in a society where some claim that those who do not keep up with the technological knowledge-based society, will remain outside and marginalised. Then what about us in the district? Can technology still help us to break through traditional supressing educational systems? Can we influence the hierarchy and put ourselves in a central position to participate in the knowledge society?

When the Internet and the virtual conduct of life is becoming an increasingly more normal part of our daily lives, we are challenged to think in new ways about how lifelong learning is organised and adapted. We have arrived at the point where campus no longer has to mean a physical place – one location. Campus and local study centers can melt together into a close integration. This meltingpot can build upon the best with physical location, proximity and human contact – and use of the Internet to establish high quality virtual interaction. We have come to a point where the large centralized institutions can cooperate in a totally new manner with small local communities to create equivalent conditions for learning – irrespective of where one works and lives. In order to succeed in this, new national educational policy is required. The attitudes of educational institutions must change and close cooperation is required among the many small communities (network).

In a wider perspective, our traditional attitudes about the importance of youths leaving home for a few years in order to get an education are also interesting. In today's society youths are much more updated on the world and are already part of this world in a completely different way than we could be 30 years ago. They are no longer isolated individuals in small rural communities. Will the desire to retain robust youths in the districts affect the structure of higher education? It just may be up to the districts themselves to decide. It is we who live in the districts who will be sitting on the "market strength" and therefore have the muscles for shaping the education environment of the future – for the local community.

Diverse approaches

As mentioned earlier, it has been of vital importance to employ several approaches simultaneously in order to get a learning network on its feet:

- *Ownership model*. Described below. Here the network itself is owned by the participating local authorities.
- *Local learning location*. In each local council a learning location/study center is established, consisting of reading room, meeting room, social milieu, video conference, Internet access and PCs, café, etc. Administrative personnel have close communication with the local population and businesses and function as organizers. Local processes are put into action to run the local road to lifelong learning.
- *Broadband development*. It is advantageous for individual locations and networks that broadband is established, since virtual lectures/instruction in real-time with many locations participating is broadband and technology demanding.
- *Joint coordination*. Centrally employed individuals coordinate needs and curriculum with each other. The creation of local study centers will provide opportunity for an increased number of participants and make a more diverse curriculum feasible.
- *Education partners*. The network links up with education partners which share network philosophy and will contribute in further development. Education partners provide courses and education in a manner that results in district inhabitants being able to make skills development a natural and inspirational part of their everyday lives.
- *Joint effort to influence central authorities* to among other things improve framework conditions for lifelong learning outside the large cities.
- *Joint innovative meetings* for further developing network possibilities.
- *Ongoing discussion* about what learning districts are. Should a learning network work with more than just courses and education?

Brief presentation of MIN

The Midt i Norden network is one of the national leading stars within school and education. In the same way that one organises for new technological infrastructures, we maintain that similar actions must be taken in relation to education for lifelong learning. These processes should be integrated with one another – and in our case broadband technology is integrated closely with development of strategies for lifelong learning in Norway's districts. MIN bases its courses and education on video conference (lectures and instruction in real-time), e-learning and local study centers.

The introduction above is a brief overview of why it is important for us in the districts to take responsibility for keeping ourselves current with the information-based economy, where lifelong learning is a main strategy. In order to initiate this strategy, we saw it as totally fundamental that we had a conscientious attitude as to what knowledge and learning are. In this we received help from the well-known educator, Paulo Freire. It was also he who inspired us to understand that it was we ourselves who had to take the responsibility for our own learning and development. Paulo Freire is concerned that the teacher must have ownership of the learning process. We have expanded this concept beyond instruction, to include the framework around the learning process and even the network itself.

Ownership model: The network is established as a private limited company owned by the local authorities, where each local authority may own a maximum of one share. Each municipal learning location is an independent, separate unit in the network. Local development occurs based on that, which is desired and practically possible at each location. Each learning location has a representative who is the contact link between municipal inhabitants and the network. All information goes back and forth through this individual. In this manner the local development process is not choked by activities higher up in the network. It is the individual locations which influence content, but also how work is performed within the network. Individual locations influence their education partners based on local desires such as how the practical organisation of courses should be structured, i.e. that the lectures must end before daycare closes for the day, that coffee breaks are desired, that video conferances are organised in other ways, etc. It is these structural considerations which increase the possibility of study participation and successful completion.

In the introduction, international discussions on the third way were referred to, which in the EU is also called the social economy. We have concluded here that local effort, initiative and responsibility are fundamental to constructive future development of society, where lifelong learning is emphasized as being fundamental. Without going too deeply into what the third way involves, one of its pillars is "empowering". This is also one of the primary reasons that the Midt i Norden network has the ownership structure it has. The goal is to prevent unemployment and to increase initiative and creativity among inhabitants.

All knowledge about how innovation arises states that it must come from within. A redeeming inspiration must occur. En route we see that we need increased knowledge to reach our goals. Nothing is better than this happening hand in hand with established educational institutions. Feeling that we ourselves have control over our own development process is a deciding motivation factor for our innovative work.

This attitude permeates the work at Midt i Norden. As concerns our students and the local community, it is they who control how organisation of the local lifelong learning will take place. It is therefore of vital importance that our education partners are coordinated with the local authorities on this perspective. The employees of Midt i Norden are therefore direct spokesmen between education partners and local locations. This dialogue is important in the shaping of all courses. All parties involved meet annually for a development seminar. Success depends on the locals really taking responsibility for organising lifelong learning. Another key to success is that we strive to work for open, creative processes where all have the possibility to feel they have helped create something. This is a lifelong challenge. Another condition is that when it comes to education partners, the attitude is that local desires and organisation are fundamentally important for successful completion of studies.

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VIDEOAKTIV: MOVIES, MINDS AND MODELS

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Overview

Web-delivered digital video and audio can engage lifelong learners by richer, more meaningful and vivid learning experiences. A new transnational project, VideoAktiv, helps practitioners develop and use educationally valuable media-rich resources through workshops and 'good practice' case studies, supported by an international community of practitioners.

Introduction

Imagine you could use a technology that would capture learners' attention and engage them in a richer, more meaningful and vivid learning experience. This technology would not only provide on-demand access and opportunities for learner interaction, but could also open up new ways of representing, delivering and sharing your subject discipline. Through the use of this technology you could visualise a process or show how something works, moves or performs live, beyond the limits of text descriptions. With this technology, you would enable your learners to 'be there' without the constraints of time, cost, space and safety. Visually literate learners learning in a media-rich environment; this is the inspiration of a new transnational project VideoAktiv.

The creation and use of digital web-based video and audio (or 'time-based media') which is commonly 'streamed' over the web is now open to non-specialist educators and even the learners themselves. Web-based video and audio could soon become a routine component of online education and e-learning, enhancing the visual sophistication of learners and staff. Of course, what is technically possible is not always what is educationally desirable. From a learning and teaching perspective, the challenge for educators is to recognise the value in 'streaming' technologies, and understand video and audio resources as powerful, innovative and creative elements to enlighten teaching and learning. This will not 'just happen', or at least not at a pace our learners deserve. Educators need support and guidance to become visually literate, to learn to effectively use and develop resources with these new technologies in ways that are pedagogically appropriate and sensitive to their learners' needs.

The VideoAktiv project

VideoAktiv builds on recent successful outcomes of British and Dutch initiatives in the use of video streaming and rich digital media in tertiary education. VideoAktiv brings together experts involved in these projects for the first time and includes partners from France, Belgium and Spain.

In the UK, the Click and Go Video project identified the local technological, infrastructural, pedagogical and accessibility barriers that inhibit the use of streaming media in teaching and learning. The project developed practical and resource-efficient tools and educational frameworks. This was disseminated via a high-profile web site, a series of popular workshops and a well-received handbook (Thornhill S. *et al.,* 2002). This was followed by a successful workshop series in the UK to introduce teaching staff to the uses of digital video and audio. In parallel in the Netherlands, the WEBstroom community has rapidly grown as with a focus on the integration of streaming media into higher education. WEBstroom supports pilot projects but the main emphasis is on community participation and sharing of knowledge and experiences of different disciplines mainly via its popular web site.

Despite these advances, there remains much to learn about the effective technical and pedagogical application of these technologies. Moreover, the practitioner community is still small, even in the

Netherlands and UK, and almost non-existent elsewhere in Europe. We believe the time is absolutely right for a practical project to enhance our understanding of visual literacies mediated by learning technologies but also cultivate the international exchange of innovation.

Digital video and lifelong learning

Moss (1983) argued over two decades ago that video and audio may be a key tool in opening scholarship to a wider audience of what we now term lifelong learners. It should enable learning to be more fun, engaging and relevant and address a wider range of learning styles than current text-heavy approaches. Moss' radical vision remains the inspiration behind VideoAktiv. "*Video, among other new technologies, offers education a challenge to rethink much if its methods and content, helping to tilt the balance away from teacher-centred instruction towards learner-centred study*" and " *to open up scholarship to wider, more dispersed and very different students that we have experienced before*". Moss continued "*It also offers the advantage of utilising vision, that powerful but neglected sense, in new ways*" and "*it may offer inspiration to a minority because its ability to represent and stimulate ideas not readily expressed in written form*". Of course Moss was referring to videocassettes, but the recent advances in digital video and audio technology have the potential at last to realise Moss' hope that "*the challenge is part of a tide [for change] that is strong enough whether or not educators wish to reform*". In the last two decades we have also become much more aware of the needs of disabled learners and VideoAktiv is strongly committed to encouraging the development of accessible media.

The pedagogical vision of VideoAktiv

The underpinning pedagogical vision is clear: to move away from the static text-dominated content currently prevalent on the web towards a media-enhanced environment. Streamed video itself can be used in many ways: 'talking head', interviews, video diaries, video labs, simulations, instructional sequences, 'fly on the wall', video help etc. Through the browser video sequences can be linked to slides, text conferencing, whiteboards, video conferencing, shared applications, online assessment and third party web sites. This seamless combination of digital video with other tools (for example in a virtual learning environment) offers an opportunity to move beyond the current perception of video as a passive presentational tool. A visual learning environment supports a range of educational activities including orientation, motivation, illustration, contextualisation, conceptualising, demonstration, instruction and analysis. Giving educators hands-on experience of producing short pieces of video can help them understand the educational potential and processes involved. The emphasis on action research with a focus on community of practice highlights the co-active approach of the project; in which participants and experts can learn from each other and contribute equally to the growth of visual literacy.

A practical way forward

VideoAktiv is developing a collaborative programme of face to face and virtual staff development workshops on digital media use and development for educators in tertiary education and which we anticipate will be of value for all educators. We are coordinating and supporting mini case studies in order to collate and disseminate European excellence in this area, and to build a proactive and reflective Europe-wide community of practitioners. Our aim is to support practitioners in becoming visually literate and to learn to effectively use and develop resources with new digital technologies in ways that are aligned with what they want to achieve educationally. VideoAktiv higher purpose is to support teachers in becoming pioneers and advocates in their own institutions, and to strengthen their passion for visual literacies through the formation of a solid European community committed to innovative education.

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APPLYING SMIL FOR MULTIMEDIA PRESENTATION AUTHORING

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Abstract

Recent advances in Internet technologies and demand for distance learning have been contributed to the popularity of e-learning. One of the factors that made distance learning more attractive is the addition of multimedia component to it. There have been many approaches in adding multimedia to distance learning content but many of them are fairly complicated and require expensive equipment. In this paper, we are introducing an easy and inexpensive and yet efficient and systematic way of adding multimedia to presentations and distance learning content using Synchronous Multimedia Integration Language (SMIL).

We have developed a multimedia presentation authoring tool called *VicDilstudio* as a part of our comprehensive distance learning project called Virtual Collaboration and Distance Learning (*VicDil*) that utilizes Java technologies such as JMF and JDOM and SMIL is used for the synchronization of multimedia components in a presentation. It captures video and audio from a presenter and creates multimedia presentation by merging PowerPoint presentation slides and a captured or a prerecorded movie. *VicDil studio* provides full control over both video and presentation slides such as size and location of each multimedia component and duration of each slide in the presentation by editing corresponding SMIL slides.

1. Introduction and Motivation

Recording a lecture in a classroom and making it available to the students can be very useful. It can be more useful if we add supplementary presentation slides or notes that go with the lecture. Adding presentation slides to the video involves timing and synchronization among multimedia components such as duration of each slide, audio and video.

Einhorn, *et al.* [14] proposed a metadata model for capturing presentation. In their paper, they introduced various type of metadata for capturing video and discussed about the usefulness of lecture video and notes but did not show how to merge lecture notes and video and make them as one entity. Schmitz [15] and King *et al.* [16] illustrated how SMIL is used to embrace computer graphics and animations.

We have started our distance learning project [17], *VicDil*[1], originally designed for medical industry with a goal to assist home healthcare industry with medical training materials that can be delivered as soon as it is available and remain available at all times. Due to the criticality of the industry, it is necessary to train the personnel required materials whenever it is available. However, it was very hard to have those personnel in one place and educate them with appropriate medical topics in a timely manner. In achieving the goal, we focused on making training materials easy to follow and make them available instantaneously. That leads us to choose multimedia presentation training materials using the Internet as a delivery medium.

VicDilstudio was developed as a partial fulfillment of those requirements. It is an authoring tool that publishes multimedia presentations using PowerPoint slides and a movie. It captures video stream or plays back prerecorded movie while synchronizing with the slides. One of the hard parts in creating such material is to specify synchronization relationships among media elements. In our model, we synchronize the video and audio with the PowerPoint slides by creating a SMIL file that specifies all the elements in the presentation. With a SMIL file, we can specify the duration of each slide, location and size of video and slide and so on.

[1] This project was partially funded by Maryland Industry Partnerships [MIPS] and Delmarva Foundation of medical care

2. SMIL Background

SMIL, pronounced "smile" is an acronym for Synchronous Multimedia Integration Language. It is a W3C Recommendation for describing multimedia presentations using the Extensible Markup Language (XML) [1]. SMIL 1.0 became an official recommendation of the World Wide Web Consortium W3C in June 1998. SMIL 2.0 became an official recommendation in August 2001.

SMIL 2.0 is a collection of XML elements and attributes that can be used to describe the temporal and spatial coordination of one or more media objects. SMIL is designed mainly for the Internet use just like XML. It can put together a wide range of technologies [2] [3]. With SMIL, different media objects can be combined into a single coherent multimedia presentation. SMIL can be used to manipulate user-preferences on location, size, and type of media objects, language, bit-rate, etc. The multimedia presentations created using SMIL may be delivered via a streaming server or it may be played from components stored locally or burnt to a CD-ROM.

There are several SMIL 2.0 players available including GR*i*NS Player for SMIL 2.0, X-Smiles and RealOne Player [4] [5] [6]. GRiNS also provide a SMIL 2.0 editor.

3. *VicDilstudio* Main Modules

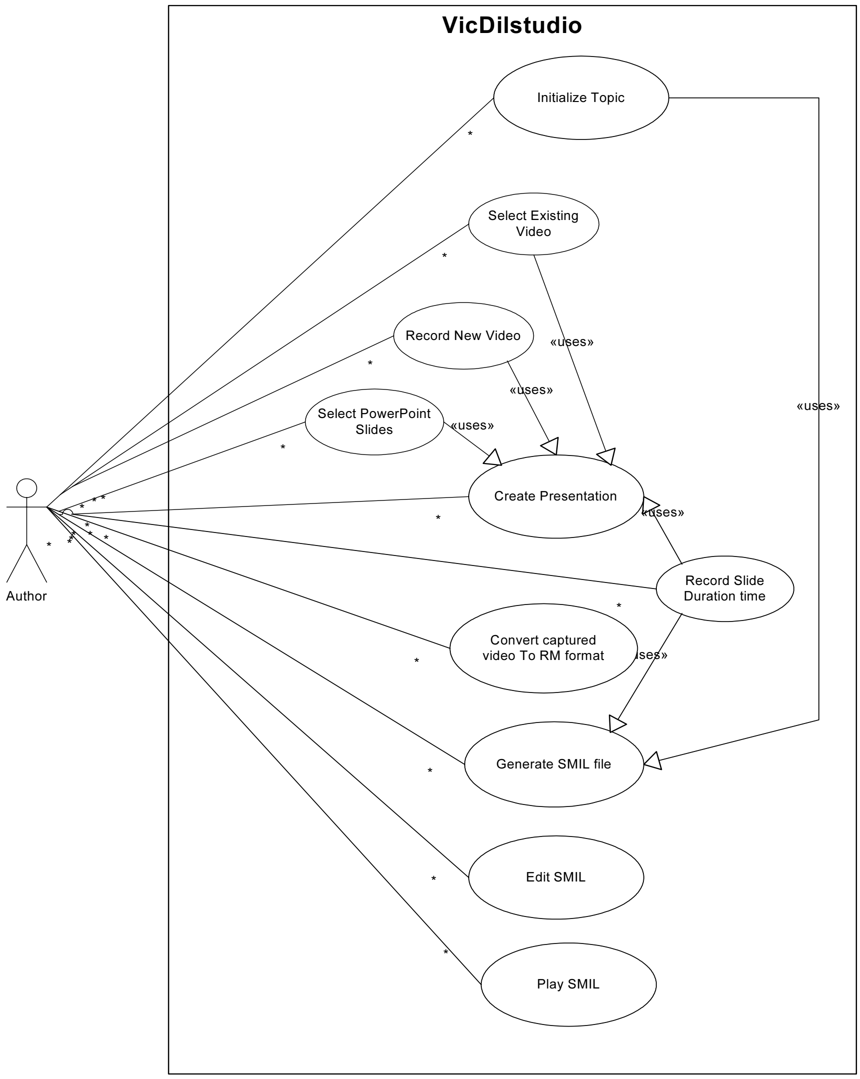

Figure 1. VicDilstudio Use Case Diagram

We have used JMF [8] for video capturing, recordings, and playbacks and JDOM [9] for parsing, creating, and editing SMIL files. JMF offers APIs [10] that are defined jointly by Sun MicroSystems, Inc. and IBM Corporation. JMF APIs support playing, streaming, and capturing of audio and video. It provides various types of codecs to support different formats of audio and video and offers a pluggable architecture to extend its support for additional formats. We have used Java 1.4.2, JMF 2.1.1 API and JDOM 1.0 API for the development our tool. Figure 1 describes major use cases for *VicDilstudio.*

Main modules of *VicDilstudio* are described as in the following:

- The Initialization Module initializes a user session. It creates or opens a presentation based on user selection and initializes other modules in the tool.
- The JMF video capture module records the video and also renders it to the screen for monitoring.
- The JMF video playback module plays the existing video selected by the user.
- Timer is triggered by the user command. When the timer is started, it invokes the video capture and marks the beginning of the presentation displaying the 1st slide. It invokes the slide loader and also keeps track of the time duration for each slide to synchronize it with the video. When the timer is stopped, it stops the video capture and marks the end of the presentation.
- The SMIL Generator compiles the information about the slides, the captured or recorded video and the time stamps and synchronizes these into one SMIL file that enables multimedia presentation.
- The SMIL Editor is used for fine tuning the synchronized presentation. The editor module reads the time stamps from the generated SMIL file. It waits for user command whether to write the edited timestamps back to the SMIL file. It also ensures that the accumulated duration of the entire slides is the same as the video running time.

Figure 2 shows the block diagram for *VicDilstudio.*

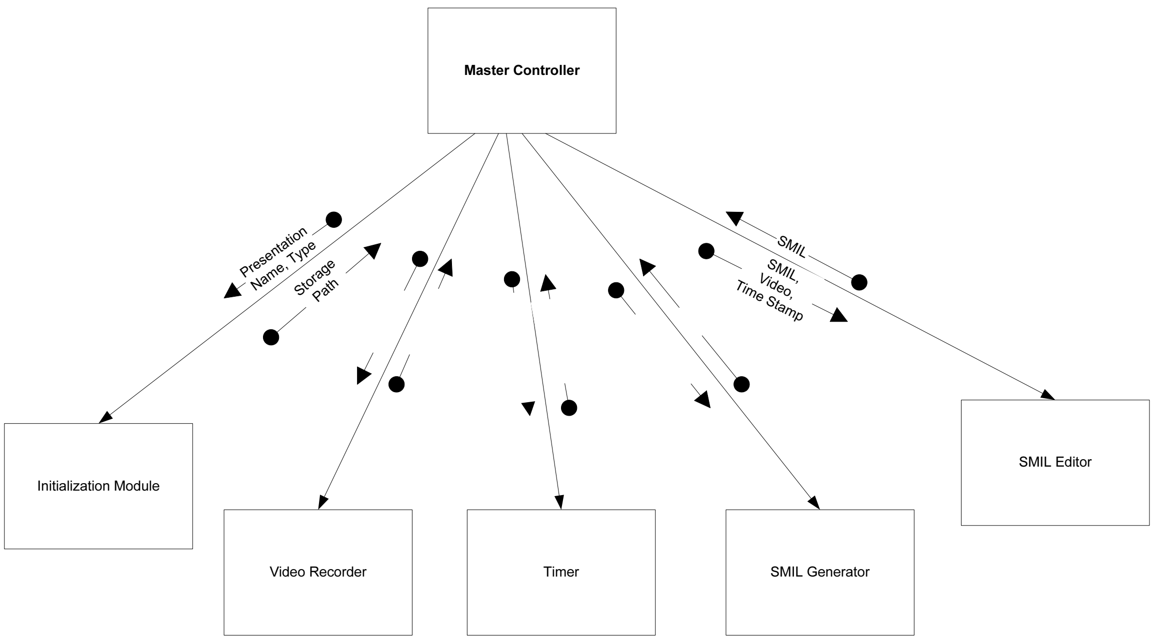

Figure 2. *VicDilstudio* Block Diagram

4. System Architecture

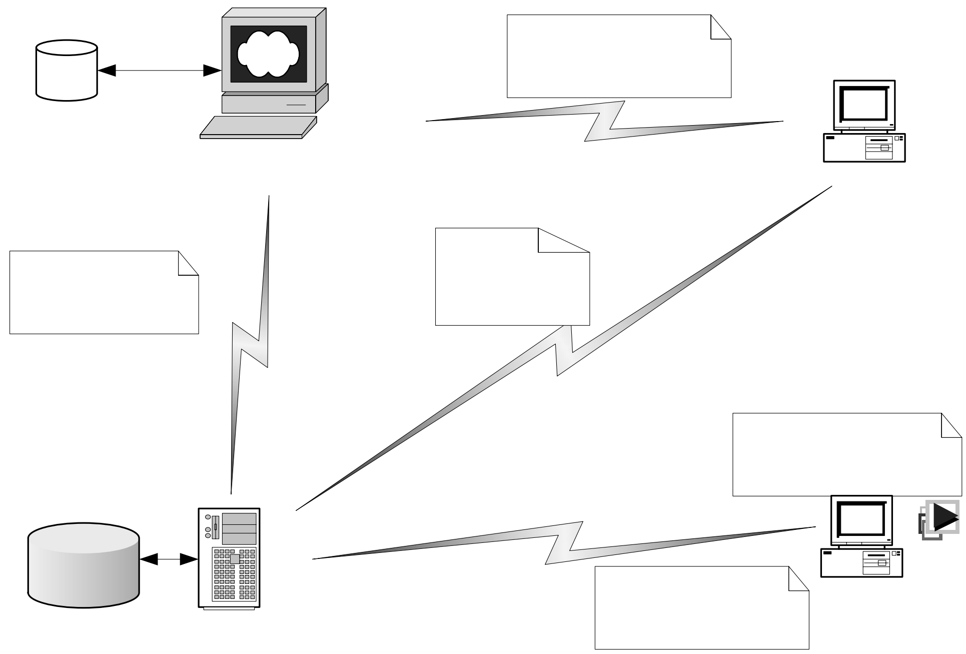

Figure 3. System Architecture and its components

As illustrated in Figure 3, *VicDilstudio* uses two servers, one for web access and the other for streaming. We have chosen Real Networks' Helix Server as the streaming server and Microsoft's IIS as Web server. The author can create multimedia presentation using *VicDilstudio*and uploads the presentations to the streaming server using FTP. Users requires to have RealPlayer [6] to view the presentation. The access to the presentations are controlled by user profile in the *VicDil* system. After authentication, users can request a presentation from Web server. The Web server then forwards the authenticated user's request to the streaming server. The streaming server fetches the presentation from its database and streams it to the user.

5. Synchronizing PowerPoint and Video

VicDilstudio creates the synchronized presentation in SMIL format. SMIL defines regions for the presentation (video, PowerPoint slides), duration of each slide and references to the video and slide files. Since SMIL is based on XML, an element and its attribute are wrapped in tags. The GUI for the *VicDilstudio* is shown in Figure 4. *VicDilstudio* defines the following the elements and attributes in the generated SMIL file:

- Region for video and PowerPoint slides: Regions are assigned to video and PowerPoint in each SMIL file using the element <region>. Each region is assigned a unique SMIL-ID.
- SMIL-ID: An ID is assigned to each child element of a SMIL element e.g. *video* or *img* in the example code.
- Parallel execution of child elements: Synchronized video and PowerPoint that are executed in parallel are child elements of <par> tag.
- Duration time: The *dur* attribute defines the duration time for each PowerPoint slide.

Figure 4. The *VicDilstudio* authoring GUI

The example below is a typical SMIL file as generated by *VicDilstudio*. The markups for each region and media declarations are clearly shown. SMIL files contain only the references to media objects, not the actual media itself.

```
<smil>

<head>
<layout>
<root-layout width="1100" height="700" background-color="white" />
<region id="ppt" left="20" top="10" width="720" height="540" fit="fill" />
region id="video" left="750" top="30" width="320" height="240" fit="fill" />
</layout>
</head>

<body>
<par>
<video src="test25.rm" region="video" id="1" />
<img src="slide1.jpg" region="ppt" id="2" begin="id(1)(0s)" dur="6s" />
<img src="slide2.jpg" region="ppt" id="3" begin="id(2)(6s)" dur="3s" />
<img src="slide3.jpg" region="ppt" begin="id(3)(3s)" dur="4s" />
</par>
</body>

</smil>
```

6. Generating and Editing SMIL

VicDilstudio uses XML SAXParser to generate SMIL. JDOM APIs are used to create and edit SMIL files. SMIL file can be created by the following statements:

```
SAXBuilder builder = new SAXBuilder();
Element smil = new Element("smil");
Document doc = new Document(smil);
```

SAXBuilder builds a document by listening to incoming simple API for XML (SAX) events and constructing a corresponding document. To declare the XML as a SMIL document we create <smil> as the root element.

<head> is used to define the structure of the SMIL presentation. <body> defines the body of the presentation. <head> and <body> are added as nodes of the <smil> document tree.

```
Element head = new Element("head"); //Create new element named head
smil.addContent(head); //Add to smil documents element (make its child)
```

This shows the steps in creating an element named <head> and adding it as a child node of <smil>. <head> contains information regarding the layout, size background. It may also contain meta data <body> contains references to media and their attributes. Media files defined within <par> are played at the same time. Change in slides can be automated by the setting the *dur* attribute of the media element to the desired value.

SMIL file can be edited by using the XML SAXParser. The editor for VicDilstudio can be used to make changes to the slide durations, addition and deletion of slides. SMIL presentation files can be opened and parsed for the media element tags. Duration information of each slide is extracted into a list and displayed to the user. Authors can either edit the timestamps or add/delete slides from the presentation. Any changes made to the list containing time stamps are immediately reflected to the corresponding SMIL file. In the following example, duration of each slide is represented by using dur attribute. The change of duration can be done by modifying the values specified by *dur* attribute.

```
<video src="test25.rm" region="video" id="1" />
<img src="slide1.jpg" region="ppt" id="2" begin="id(1)(0s)" dur="6s" />
<img src="slide2.jpg" region="ppt" id="3" begin="id(2)(6s)" dur="3s" />
<img src="slide3.jpg" region="ppt" begin="id(3)(3s)" dur="4s" />
```

In our project, we use Real Player as SMIL player. Figure 4. shows multimedia presentation created by *VicDilstudio*.

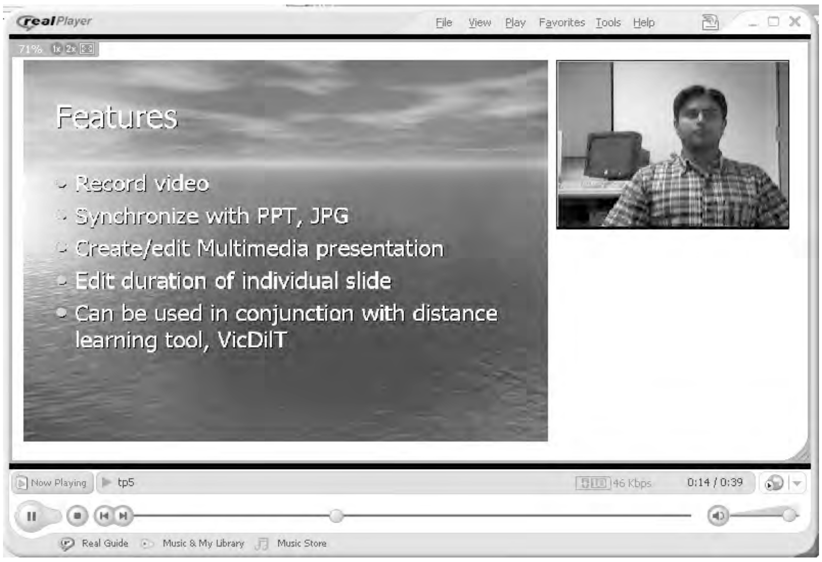

Figure 5. Multimedia presentation in action

7. Conclusions and Future Work

We have introduced an easy and efficient way of creating multimedia presentation by using SMIL 2.0. We have applied SMIL 2.0 to our multimedia presentation authoring tool called *VicDilstudio* that can capture and record video from various video capturing devices and merge it with PowerPoint slides. We have provided SMIL editor that can manipulate duration of each slide and synchronize with captured video. We incorporated a family of Real technologies such as Real Producer, Helix server, and Real Player and Java technologies such as JMF into our tool to create multimedia presentations. *VicDilstudio* can be used in any platform. As a future work, we plan to add our own SMIL player and make *VicDilstudio* web-accessible so that it can be accessible from anywhere, anytime.

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E-LEARNING IN CIVIL ENGINEERING – UNIVERSITY TEACHING AND CONTINUING EDUCATION

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Abstract

The paper is about the design and development of two e-learning systems in civil engineering. The two research projects have been funded by the German Federal Ministry of Research and Education, dealing with construction materials and building physics respectively. Both were completed by the middle of 2004. They are used at several German universities for student education at present.

The two systems have served as a basis for further development: their functionality has been merged at Darmstadt Technical University to facilitate access for the students to both topics. Additionally, software and experience gained from the research has led to the establishment of a system of further education ("OWS[1]") to teach varied topics to practising civil engineers.

Both the systems for university use and for continuing education combine presence teaching and e-learning ("Blended Learning"), making use of special software which allows teachers to use elements from the pool of e-learning material in presence lectures.

Moreover, new content can be added easily to the system, allowing rapid production of new courses especially for continuing education.

Introduction

Two learning networks were developed at the Institute for Reinforced Concrete Design and Construction Materials from 2001 to 2004. They were funded by the German Ministry of Education as part of the program "New Media in Education" [1].

The first one, called WiBA-Net[2] [2], deals with the subject "construction materials". Its main focus was to transfer a whole university class to e-learning. "Construction materials" is a topic that is taught to every student of civil engineering and architecture in Germany. It deals with properties and usage of materials such as concrete, steel, plastic and so on. Unlike other subjects at German universities, there is a memorandum of the university teachers concerned, which defines the content to be taught at all universities [3]. The project was developed as a cooperation of six universities.

The second project, "LNB[3]" [4] is used to teach building physics, which is about moisture-, heat-, noise-, and fire protection in constructions. Here, the emphasis was put on applications and exercises, enabling the learners to apply knowledge to different tasks. A special feature is an application to display different types of buildings in a three-dimensional mode. All parts of the buildings can be selected and attached with different materials and properties, allowing the student to make calculations based on those interchangeable values.

An evaluation during the developing process among the users – teachers as well as learners – took place, giving important guidelines by which to form the resulting platforms and content. For example, the courses feature an introductory page giving the content, the learning target and possible necessary previous knowledge as well as a self-test for the students at the end.

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[1] Online Weiterbildungssystem = Online System for Further Education

[2] Werkstoffe im Bauwesen und in der Architektur = Construction Materials in Civil Engineering and in Architecture

[3] Lernnetz Bauphysik = Learning Network Building Physics

Two ways of delivering content were followed in the process of establishing the networks for university education: e-learning and presence lectures, augmented by material made accessible over the internet ("Blended Learning"). Moreover, the content as well as the platform are now being used in continuing education. Again, two modes of delivery are applied: e-learning, augmented by a presence lecture to help save travel costs and time.

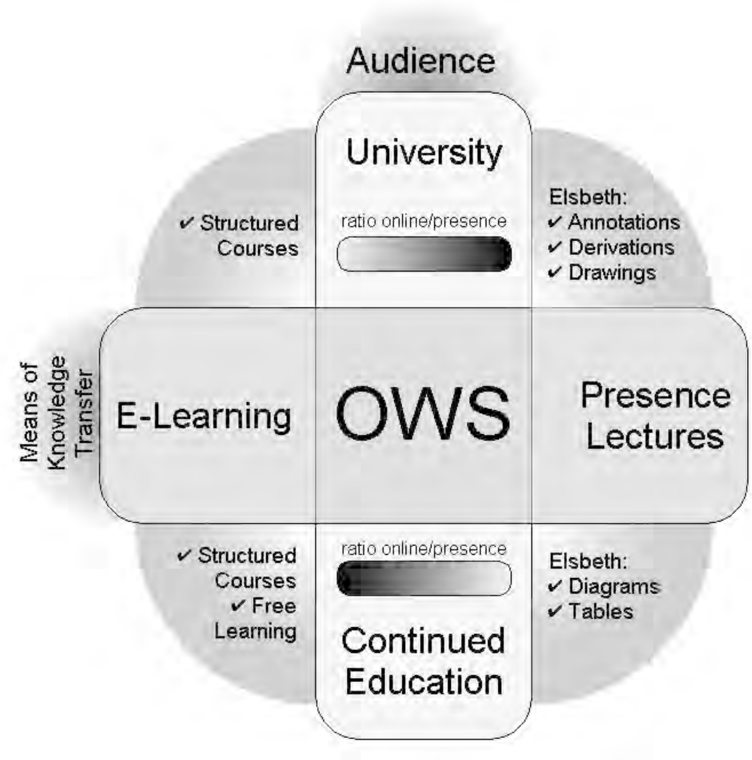

Figure1. Delivery modes of OWS

Development Process

Activities Before 2001

At the Institute for Concrete Structures and Building Materials, e-learning software has been used from as early as 1994. CBTs on the topics of "building physics" and "construction materials" were developed and distributed to the students in the form of floppy disks and later CDs. They were used to teach demanding calculation techniques to the students, e.g. for the condensate accruing between different layers of a wall structure or for the correct composition of a concrete mixture. Those CBTs contained animations of the calculations so the students could see what they were doing (didactically, a constructivist approach), but the aim was to provide background information as well which was linked to the program itself and could be accessed if necessary.

Research Program "New Media in Education" (2001 to 2004)

The learning networks "WiBA-Net" and "LNB" were developed from 2001 to 2004. Early on, it was realized that pure e-learning would not be sufficient to achieve the aims of the projects to significantly enhance the classes in the respective subjects. A combination of presence teaching and preparation and wrap-up respectively by e-learning was aimed at. Furthermore, it became obvious that the students and teachers would not accept the difference in the media applied, e.g. overhead slides in the lecture and high-end animations on the internet. The result was a new program called "Elsbeth[4]" [5] [6], which helps the teachers using the networks' materials in the lecture and distribute them to the students along with their annotations via the internet after the lecture.

The program "Elsbeth" allows searching of the system's database, selecting appropriate material for a lecture and composing it to a presentation. The software allows the teacher to pre-select the next picture or animation he wants to show, make annotations in existing material or use blank slides to write derivations and do drawings on the screen. The system was tested on a Tablet PC, but can be used as well with a normal laptop with a graphic digitizer.

The pool of material to be used for e-learning as well as in the lecture is the combined material from several universities. Thus, it is possible to select from high-end animations and pictures for nearly every aspect of the subjects related.

Current Research

In 2004, after the end of the research projects, some more features were added to the networks, e.g. a platform for offline work, i.e. teaching and exercises, and export functionality for "Elsbeth" to allow the user to create Powerpoint presentations. This allows teachers to use the web-based functionalities of the program without having to install a special viewer for holding the presentation.

Another aspect has been considered for the past two years: how the platform could be used to distribute the material created to engineers in practice, who want to keep up-to-date or renew their knowledge. One solution was to form an association to distribute the already existing material. Everyone who wants to access the network can join the association for a small fee that is used to maintain the servers. Moreover, the platform created can be used to offer more specialized and practice-related content to people in engineering. Thus, a system called "OWS" was launched to distribute newly and specially created content from the Institute for Concrete Structures and Building Materials.

Continuing Education in Civil Engineering

Due to the difficult economic state of the German building industry [7], especially small and medium enterprises from construction or planning are faced with hard competition. This development goes along with declining numbers of first semester students in civil engineering and architecture [8].

Continuing education has become a strategic target of economic development today. All education-related activities of employees improve their knowledge and abilities and thus enable them to better solve special problems. Processes can be optimized and an enterprise's workflow can be enhanced by schooling the employees. Moreover, new and modernized standardization and calculation methods demand highly specialized engineers. For example, the standard for heat-protection in Germany [9] requires an all new approach to the energy-related proofs when planning a building. The same holds for the design of reinforced concrete due to the adoption of DIN 1045 [10]. Courses for both topics are in great demand at the time of this writing.

E-learning in continuing education has the benefit of saving time and travel costs for employees. E-learning courses can be worked on during office hours (for employees) or during free-time (freelance engineers and architects) and thus make the learner independent from fixed course times. Conventional e-learning in continuing education focuses on preparing the learners for presence lectures [11] by teaching them mostly factual knowledge. OWS aims to offer its courses mainly via e-learning, asking the learners only to travel to the introductory session, by teaching problem-solving knowledge as well: learners can be assigned complicated tasks that can be worked on by using the three-dimensional house, other applications or by using the interconnected courses. The use of the three-dimensional house enables the learners to test their competences like they would do on a real house.

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[4] Elektronische Lernelementsortierung und – beschriftung – Erstellung teilautomatischer Hörsaalpräsentationen = Electronic Sorting and Annotation of Learning-Elements – Creation of partly-automated lecture-hall presentations

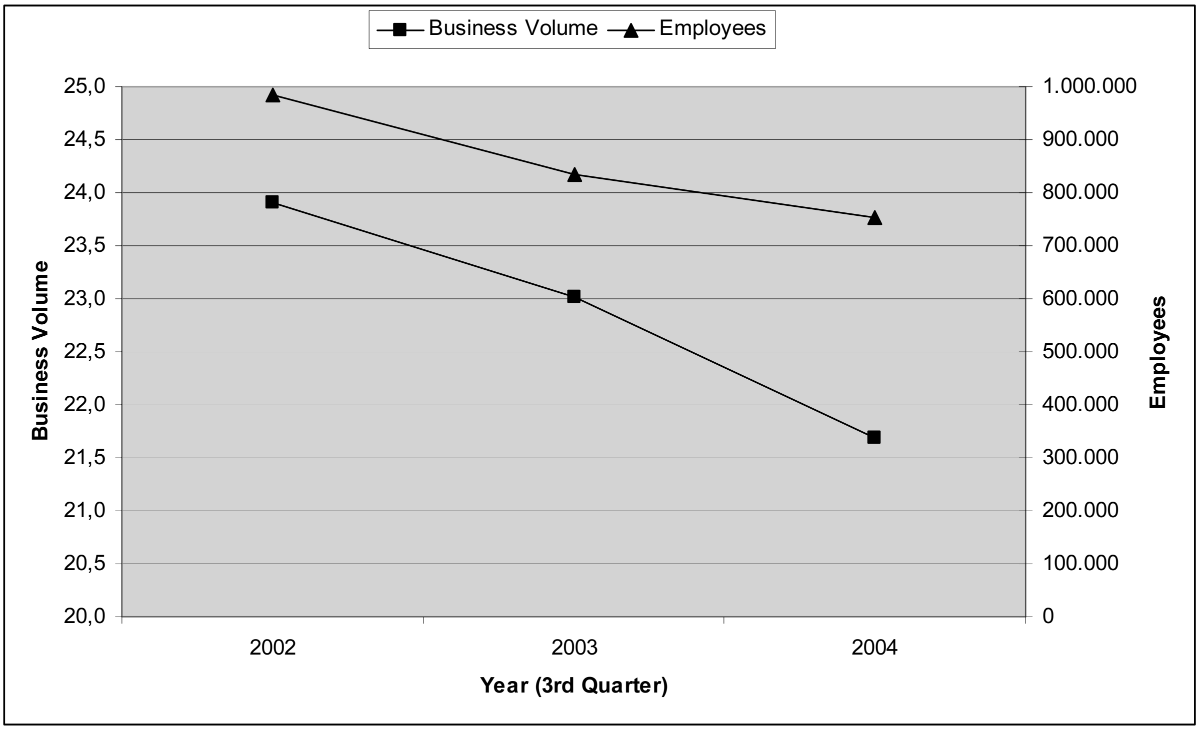

Figure 2. Business volume and employees in the German building industry [7]

From University to Practice

Having gained valuable experience from the research projects, the next step was to test the results in practical continuing education. In cooperation with "Odenwaldakademie", the official continuing education center of Odenwald County, two online courses were created in 2003 and 2004 on the topics of biomass energy and carbon dioxide reduction respectively.

As a result from this, the system OWS was created. It allows the customers access to booked online courses, easy content production, either with an external editor or the built-in html- and image-editors. Content is provided either directly from the respective experts of the Institute for Concrete Structures and Building Materials or made available by the customer and edited by the OWS authors.

A second cooperation was agreed upon with the Hessian chamber of engineers, an organization representing all freelance engineers and those with authorizations for special proofs like fire or heat protection. The chamber already offers further education to its members, but so far no attempts to introducing e-learning were made. Engineers wanting to be authorized for certain proofs have to receive a degree in the respective topic first and renew it every two years. This process will be made easier by the use of OWS, offering all necessary courses and material over the internet.

One day of introductory presence teaching will be held before each online course, making use of the presentation technology developed for university classes. Thus, a seamless integration of presence lecture, e-learning and handout material can be achieved. A special feature of the software offered to learners is the offline component, the so-called "teaching and exercise platform". It enables the learner to download all the e-learning courses and accompanying exercises to his laptop and work with it whenever he or she has the necessary time. An adjustment between the user-tracking data on the personal computer and on the server is made at the push of a button when the learner is online again.

Different Delivery Modes

The system OWS features four delivery modes, each using e-learning material form a central server in a different way:

- university e-learning;
- university presence teaching;
- continued education e-learning;
- continued education presence teaching.

University

The ratio of e-learning and presence teaching is about 1 to 4, depending on the time the students invest in preparing for lectures with one of the learning networks. The students are expected to visit the presence lectures and exercises and use the e-learning system to do their home studies. At university level it is important for students to have a “real” teacher as an attachment figure. A real teacher is better able to answer questions, as the learners have only very limited previous knowledge. For this reason they should not yet try independent self-learning [12]. The e-learning content is presented to them in the form of courses that are specially recommended to them at the appropriate time. In the presence lecture, charts and diagrams along with many illustrating examples are used with “Elsbeth”, as well as hand written derivations of formulas or drawings.

Continued Education

Here the ratio of e-learning to presence teaching is about 7 to 1. Each e-learning course of seven units is preceded by one “real” course. The learners have significant previous knowledge, both from their studies and from work experience. Moreover, they mostly have first practical experience on the subject taught as well, e.g. by assisting a senior engineer in a certain calculation. To save time and costs, the learners will have to take only one presence course. When working on the e-learning material, they are assigned structured courses as well, but they have the ability to freely work with the material offered, “surfing” through different pieces of interconnected content and working at their own speed and directions. In the presence lecture, “Elsbeth” is used to show slides and diagrams, only few examples will be used as they can be more efficiently presented in the form of e-learning courses. The same applies to derivations and drawings.

Experiences and Outlook

Both learning networks have been evaluated accompanying the development. Suggestions and criticism form both learners and teachers could thus be taken into account. For example, introductory pages with information about courses’ content and self-tests were established. The networks are now being used at several German universities. A recent evaluation of the students at Darmstadt Technical University regarding WiBA-Net shows that the students like the network and are using it often as well. The augmented presence lectures received good grades as well (an average of 4.33 out of 5 possible points), confirming that the teacher uses “adequate forms of presentation”.

The experience gained at the “Odenwaldakademie” shows that it is possible to produce and deliver content for continuing education with OWS. A first course on the topic of fire protection was produced for the chamber of engineers. The e-learning courses on heat protection and energy-saving building are being produced at this time and will start in September of 2005.

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SETTING UP A EUROPEAN ICT NETWORK OF POST-PRIMARY SCHOOLS: CITIZEN E

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Background rational

That there is a clear move in school education towards a new learning paradigm, is commonly observed. This new learning paradigm represents a shift away from instructionism towards constructivism. Constructivist visions for the future education system where students are individuals and a differentiated learning approach is adopted, where a clear focus is upon social participation and where teachers act more systematically as advisors, guides and supervisors for students seem to be globally shared. What seems also to be commonly perceived, is that the use of ICT holds great potential for supporting or even being the transforming agent for the above mentioned shifts towards a new learning paradigm. This has led to a whole series of European policies and initiatives which extensively promote the take-up of ICT by schools.

But in spite of all these innovative projects, information and communication technologies are not yet commonly used in the average European classroom. Teachers should use technology to supplement learning but what we now see is that technology is often taught in isolation and that many teachers still lack opportunities to use ICT in the classroom for non-ICT subjects. Without this experience, they are unlikely to really integrate ICT into their daily teaching. And only if the use of computers is so infused that the students think that technology is part of the natural learning process, the constructivist vision is correctly applied.

Further investigation on how to integrate ICT in daily teaching is certainly required but such investigative research can only be carried out be incorporating willing teachers in the process of developing teaching practises. The active involvement of working teachers is what lies behind Citizen E. Citizen E is a European project funded under the Minerva programme to promote European cooperation in the field of Open and Distance Learning (ODL) and Information and Communication Technology (ICT) in secondary education, resulting in 'best practice' in this field and contributing to the understanding among teachers and students of the technical and pedagogical implications of ICT. By involving willing teachers from the very beginning of the project who will work in close contact with the educational experts of the partner teacher training and support centres, teachers will learn how to integrate ICT in their daily teaching. The project concentrates on the learning process of the teachers and not so much on the technology used, and is founded on several principles, first of all the use of low-cost and accessible technologies, secondly on the fact that all activities should be immediately scalable and allow for significant take-up even within the project lifetime and thirdly that those targeted should not be the early adopters of ICT use within schools but rather those teachers who have been slow to integrate ICT within their teaching and who are not usually involved in ICT-related activities within their schools.

Project description

Citizen E began in October 2004 and will continue until September 2006. It involves 5 partners, all of whom are engaged in in-service teacher training. They are:

- Mayo Education Centre responsible for in-service teacher training in rural Co. Mayo, one of the 22 full time regional education centres in Ireland supported by the Department of Education and Science in Ireland.
- Pixel Associazione in Italy, which is a non-profit association for the promotion of innovation in education and training which includes training teachers and trainers in the educational use of technology and in the management and integration of e-learning in traditional educational pathways.
- In-Service Teacher Training Centre in Czestochowa (WOM), located in Silesia in Poland, one of 47 similar types of centres in Poland; responsible for organising occupational development and methodological counselling for teachers, headmasters and principals of schools and educational establishments in the region.
- Katholieke Hogeschool Sint-Lieven in Belgium who through their special unit SMIC (Scholen Multimedia Internet Centrum) is in charge of educational innovation including promotion of ICT supported education. This covers not only university level, but also the training and retraining of primary and secondary school teachers in the use of ICT.
- ATiT, Belgium responsible for project management who are experienced in teacher training and European collaboration in the applictaion of ICT in Education.

The project begins with a set of workshops designed and carried out by the project partners during March 2005 to train local teachers in setting up virtual twinning activities with other European schools through the use of ICT. To facilitate communication between the different European countries with their different educational systems the project consortium chose content wise for the topic of European Citizenship as an important binding factor. An additional focus during the workshop will therefore be on the development of teaching materials and activities on the topic of European Citizenship. The workshops are being held in Ireland, Italy, Belgium and Poland for about 56 teachers. The programme of these workshops will consist of several practical modules. Teachers will learn how to use an online collaborative environment, how to set up twinning activities and mini-projects, how to guide student groups communicating online and how to use other basic ICT communication tools like e-mail. A twinning activity in this context is a long term partnership where at least two schools from at least two different European countries use ICT to carry out some form of pedagogically relevant activity together while a mini-project is a short-term activity developed for a day, a week, a month, or longer along specific pedagogical guidelines and using particular resources.

Following these workshops, teachers will return to their schools to recruit and guide students in these virtual twinning activities and mini-projects. A first roll-out of the project activities in schools will involve 7 schools per country and aims at 14 twinning arrangements and 14 mini-projects and will be followed by a thorough evaluation of the whole process which will take place with the participating teachers in a workshop in Florence in early June 2005. Based on these conclusions the same process will be repeated in the second project year, this time expanding the network to reach more than 50 schools. At the end of the project a manual with all best practises recorded during the project lifetime will be published.

Objectives

Citizen E has a number of specific objectives:

- Increase ICT skills of teachers and promote the further take-up of ICT in the classroom, especially in non-ICT subjects.
- Benchmark the in-service training and support given by each of the networks so as to build a best-practice framework for the delivery of training to the teachers taking part.
- Develop teaching skills and resources on the subject of European Citizenship by setting up peer and group working arrangements to identify, create and evaluate learning resources on European Citizenship.
- Increase intercultural understanding and promote a European identity amongst teachers and students by activities like school twinning and student mini-projects.

- Share “Best Practices” arising from our work to a network of teachers and educational practitioners through the project partners and the international, national and regional and networks to which they belong.

A project like Citizen E, focused on readily accessible ICT supported methodologies, like the collaborative platform chosen for Citizen E which also allows for web publishing, embedded in a training and support framework provided by existing in-service training and support networks, can positively influence teachers’ daily use of technologies in the existing curriculum.

Furthermore the subject area chosen, European Citizenship, lends itself well to cross-border collaboration enabling in-service support networks; teachers and students build up key experiences as well as practical classroom resources in an important subject area.

The idea for Citizen E arises from the needs expressed by in-service teacher training and support networks for opportunities to collaborate with peer networks in other parts of Europe using ICT. Such opportunities can be made possible by the use of ICT, and the experience itself can be used to build up skills and know-how in the effective use of ICT in the classroom by teachers who are not normally targeted ICT users in schools. Our use of readily available technologies is a deliberate strategy based on our belief that busy teachers will be far quicker to use relatively familiar tools that do not require local technical support and/or expensive access or local infrastructure.

Approach taken

Our emphasis in Citizen E is on building good teaching strategies and working peer networks amongst the participating institutions in order to ensure real added European value to the project. Furthermore, by using readily accessible ICT supported methodologies based on the use of low-cost tools, which do not require either high bandwidth, or expensive and complicated technology means that the project activities can be repeated by teachers all over Europe regardless of location, background or budget.

We focus on European Citizenship as a subject area as it lends itself well to cross-border collaboration and where the activities we plan can have a considerable impact on its teaching. Part of our reasoning is a desire to really bring the subject of European Citizenship alive for both teachers and students in different countries by providing practical opportunities for contact and exchange. Despite the treatment of “Europe” in different subjects (e.g. History, civics, geography, see Annex 1 for a short description of how European Citizenship is treated in each of the countries taking part), the reality of a common European identity does not yet exist for many people. The reason for this is not only the relatively young age of the European Union but also each country’s unique geographical or political relationship with Europe. The four networks taking part come from countries with a deliberately different perspective on Europe. Ireland, and in particular rural regions in Ireland, can be seen as being very much at the margins of the European Union from a geographical point of view. Belgium, on the other hand, is perceived to be at the “heart”, geographically at least, and one of the founders of the Union. Poland, one of the accession countries about to join the Union, offers yet another context and experience, while Italy clearly represents a Mediterranean perspective on Europe.

The pedagogical approach taken focuses on an Action Learning approach, i.e. learning by doing, which is primarily based on peer learning. This means that the learning process is collectively organised and takes place in a multicultural setting where a conscious synergetic process is encouraged. Interpersonal communication is emphasised to facilitate learning from one another. This approach leads to a constructivist pedagogy which is fully interactive, discursive and built on a cycle of trials, evaluations and adaptations. One of the main reasons for choosing to use technology which is relatively widely available and for which extensive technical support is not required is to ensure that the emphasis is upon learning, on pedagogy and on developing and sharing good teaching practice. The project partners and teachers taking part use the tools provided to communicate, exchange information and collaborate to create rich and meaningful teaching opportunities, which, in turn, can be used to inform others interested in similar cross-border activities.

Concrete outputs

A first concrete output of the Citizen E project will be the training workshops for teachers taking part. These will be held in each partner institution and will be based on a common one-day syllabus, which will be created, by the four in-service training and support organisations. The project consortium will create this syllabus and the associated training materials and resources following a workshop where they will compare and contrast training normally provided and incorporating content and input about the ICT tools to be used. Eight workshops will be run (2 in EN, 2 in NL, 2 in PO, 2 in IT) attracting between 105 and 175 teachers. Training will be given by local staff and evaluation to be carried out by project evaluator. At least one observer from one of the other networks will attend each training workshop to assist in the evaluation and benchmarking of these training workshops as well as to gain additional practical experience. The syllabus will be refined and adapted to take feedback into account from stage 2 to stage 4 in order to improve the workshop offered.

A second concrete output of the project will be the various syllabi along with training materials (in EN, NL, IT, PO) that have been created for the teacher workshops. These materials will include the ICT support materials shared amongst the in-service teacher support networks in each country and the teaching materials on European Citizenship, some of which will be translated into appropriate languages as needed and which will be then made available to the wider educational community by publishing them on the project website.

What will also come out of the project is a continuously updated and publicly available web site that will reflect the ongoing development of the network and advancement of the knowledge and skills of those taking part. The site will include background and information on all those taking part, including school and network descriptions, local information about the cultural context and reality of the schools taking part and a regularly updated news service providing current information on what is going on in the schools and in-service networks involved, a section listing available didactical resources (in EN, NL, IT, PO) for use in teaching European Citizenship in each country and in setting up twinning activities and mini-projects with other schools, peer-evaluated by the Citizen E teachers and offered to other interested teachers in Europe, references to interesting reports, manuals, projects and initiatives that have already taken place relating to both in the use of ICT in schools and the topic of European Citizenship, thereby acting as an information gateway on the topic of ICT and European citizenship for all educational practitioners.

A fourth concrete output of the project should be a series of 35 twinning arrangements and 35 collaborative mini-projects between participating schools. All teachers taking part are expected to involve themselves in at least one twinning arrangement with another school and at least one mini-project. The outputs of these activities in the form of reports, journals, research documents, and project work will be published on the project web site and a selection will also be used in the best practice manual as illustrations of the kinds of activities students, supported by their teachers, are able to do as a result of the impact of Citizen E.

The collaborative platform based on LDU, a platform fully customised to meet the needs of the Citizen E community, is a fifth output of the project. This platform will allow easy web-based access to a collaborative environment which will be adapted to allow for group messaging, collaboration, document exchange and web publishing to the Citizen E web site.

What will also be made available in the second half of the project is a 'best practice' manual (in EN approx. 75 A4 pages with summary information available in PO, NL and IT), available electronically, which will gather the experiences of the project partners and make them available to the wider public. This will provide tips, guidelines and other information aimed at helping others interested in building up collaborative networks amongst schools gathered through Citizen E and will contribute significantly to the wider dissemination of the working practice, experience and resources created by the participating institutions amongst their counterparts in their own countries as well as other European countries.

Annex 1: European Citizenship in Belgian, Italian, Irish and Polish secondary schools

The following text gives a brief overview of how European Citizenship is handled within the curriculum of each of the countries taking part in Citizen E where we have chosen to focus on the 13-18 age group in schools as it is during this period of students education in Belgium, Italy, Poland and Ireland that considerable emphasis is placed in the curriculum on subjects which broadly relate to European Citizenship.

In **Ireland** European Citizenship is addressed within the CSPE (Civics, Social, Personal & Environmental) subject area taken by students aged 14-15 when students are expected to produce some project material relating to Citizenship, the subject area is then further elaborated during the option Transition year when 15/16 year olds can take an optional year between the junior and senior learning cycles to engage in more project based learning activities related to their future career path and where the emphasis is upon action learning rather then formal examinations. During CSPE, students are expected to learn how the European Union works, how structures like the European Council and European Commission function and how they, as European Citizens, can fully participate in the EU.

In **Italy**, the topic of European Citizenship is dealt with under the broad subject area Civics, which is studied at secondary school level by students aged 15/18, for those attending lyceum. The content largely depends on the teachers' interest but pupils are at least expected to reach a broad understanding of European Union processes and activities. In technical schools the study of Civics may not be foreseen but in certain technical schools, Law is a compulsory subject and within this area, European law is addressed.

In **Poland**, the topic of European Citizenship is one of the most important topics in schools, especially amongst pupils aged 13-17. It is obligatory and results from curriculum. Pupils are expected to learn to understand issues connected with the European Union, Civil Rights, law, environment etc. within the confines of a subject called "Knowing about Society" (Civics) and History. Contents of this curriculum include; the history of European integration (from antiquity to the present time), factors of the European integration and disintegration, Poland and Polish citizenry in Europe building, the European organizations and Poland's place in this organizations, European Union – the aims and rules of the operation and the main institutions, European law and its consequences for Polish citizens, European educational cooperation in Europe, European Citizenship and Europe in the world. In addition many schools are interested in the challenges of European Partnership and so they take part in "European School Clubs". Many Polish secondary schools participate in the Socrates Comenius Programme.

In **Belgian Flemish** secondary schools the aspects of European citizenship including the history of the European Union are being dealt with in the history and geography courses of the two last years of the curriculum. Furthermore a lot of modular thematic project work related to European aspects is being increasingly stimulated during the whole curriculum. Examples of this thematic project work include the organisation of "European Parliament" simulations whereby Belgian and foreign pupils come together in a formal location and engage political discussions on actual themes such as migration and environment.

ONCOCASE: A PLATFORM FOR PROBLEM-BASED LEARNING IN THE FIELD OF NEURO-ONCOLOGY – THE TÜBINGEN UNIVERSITY EXPERIENCE AND PERSPECTIVES FOR LIFE-LONG CONTINUOUS EDUCATION

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Abstract

Neuro-oncology is a sub-specialty of oncology. Due to the low incidence of central nervous system tumors, medical education in this field of cancer has several short-comings. To improve the instruments for medical teaching and learning in neuro-oncology and to provide a common basis for education of medical students in this field we constituted a multi-faculty interdisciplinary program with the aim of developing a platform for problem-based learning in neuro-oncology. At Tübingen University we successfully constructed a virtual web-based clinic called *OncoCase*. In the paper presented here we report on the pedagogical fundaments of the program and its components including tools for multi-dimensional evaluation. We characterize our first experience with *OncoCase* in student seminars and present our future concept for integrating the platform into a model of life-long education of medical professionals.

Introduction

Neuro-oncology is a sub-specialty in the wide-spread field of oncology dealing with primary and secondary tumors of the central nervous system. Diagnosis and treatment of these tumors typically involve a variety of clinical specialists such as neurologists, neurosurgeons, radiation oncologists, or medical oncologists. Neuro-oncology may thus serve as a model for interdisciplinary oncology. In the field of medical education, however, neuro-oncology plays only a minor role due to the low incidence of central nervous system tumors. In order to improve the neuro-oncological knowledge of medical students we initiated the interdisciplinary multi-faculty program *OncoCase* with the aim of developing and implementing an online tool for medical education in this field of oncology. We summarize here the methodological background and set-up of the platform with particular respect to the Tübingen University experience. We report on the conceptual grounds of teaching and learning developed for the platform and will extend our preliminary classroom experience with medical students to the idea of life-long education in a highly specialized field of medical practice.

Methods

Why OncoCase was developed

In 2003 the medical faculties of Tübingen and Freiburg University, Germany, founded a multi-faculty interdisciplinary group constituted by neurologists, neurosurgeons, radiation oncologist, radiologist, neuro-pathologists, and computer experts with the aim of developing a web-based computer platform for problem-based learning in the field of neuro-oncology as well as structures and models for interdisciplinary medical education in this field. The idea was to provide a broad, inter-faculty and systematic basis for neuro-oncological teaching and to improve medical education in this highly specialized field of oncology with the perspective that this project might serve as a model for computer-based learning as such at the faculties involved. The program was supported by a grant from the Ministry of Sciences and Arts (MWK), Baden-Württemberg, Germany.

The OncoCase platform

At Tübingen University a specifically designed platform was developed simulating the situation of a real hospital. The idea was to get the users of the platform as much involved in their doing as possible. Therefore, a main focus of the conceptual design of the platform was to create as much immersiveness and presence as possible [1]. Details of the virtual clinic subsequently developed are presented elsewhere [2]. In short, the virtual clinic provides real cases of patients with neuro-oncological disorders as well as systematic content for self-esteemed learning like tutorials, internet-links on relevant sites and others. The virtual *OncoCase* clinic as realized at Tübingen University was established as a module in the pre-existing platform *PROMETHEUS* which in principle follows the same pedagogical concept as *OncoCase* [3-5]. The virtual clinic is constucted by a sequence of scenes drawn by an artist. The patients evaluable in the clinic represent real patient cases previously treated at our institution. After constructing the platform, the *OncoCase* clinic was fully functioning in summer term 2004 and has been subject of systematic evaluation ever since.

The OncoCase concept of medical education

The basic pedagogical concept of *OncoCase* is that of problem-based learning. In the virtual clinic this is achieved by presenting the patient cases to the students just as they would appear in the clinic ambulance. That is, the *OncoCase* user can systematically collect information on the patients' history which is then stored in the virtual patient folder. The user subsequently goes through a series of physical examination procedures just as he likes. Afterwards technical or biochemical examinations like blood tests may be initiated. As the user goes through this procedure he is encouraged to come to the primary and secondary diagnosis. All steps of the user in the system are systematically logged. Finally, the virtual patients folder will be closed and the case will be solved. This is a crucial step in the process of online-learning in the system since the student will be presented a critical assessment of his actions in the system including e.g. necessary or unnecessary investigations, time spent and others. These features of the *OncoCase* system as realized at Tübingen University offer the student full access to self-determined learning independent from time or place. Furthermore, according to the *OncoCase* concept of education the student is then encouraged to collect systematic information on the patient case solved and the specific neuro-oncological diagnosis by means of electronic or conventional media. This step is intended to prepare the conventional classroom session of the blended learning sessions which form the primary pedagogical concept of *OncoCase* courses of teaching. The idea behind this concept of a combination of online-sessions and conventional classroom presentations was to offer the students the possibility of self-determined problem-based learning at the one hand. On the other hand it was agreed that it was necessary to supplement this process of learning with more systematic content as well as discussions and reflections in the entire group of students to round-up this process. Furthermore, reflecting the multidisciplinary character of neuro-oncology, the educational concept of *OncoCase* was guided by the idea of interdisciplinary teaching. This was realized by a team of 2-3 academic teachers who jointly went through the classroom sessions with the students.

Content of the OncoCase platform

The cases implemented into the *OncoCase* platform are real cases of patients treated at the clinical units of the participating partners in the project. Each single case with primary and secondary diagnosis was specifically adopted for presentation in the platform. In addition, systematic content was developed substituting each single case with background information or giving more general information on specific topics in oncology. This information is available in the virtual library of the clinic.

Results and Perspectives

The preliminary Tübingen University experience with OncoCase – extension to the idea of lifelong education

Since summer term 2004 the platform of the virtual clinic PROMETHEUS as well as the specific module *OncoCase* have been evaluated in three subsequent student courses. Details of the evaluation process of PROMETHEUS are presented in a different paper by Schäfer *et al.* [2]. In December 2004 a first group of students (n=11) participated in a one-week course on a dedicated *OncoCase* course on neuro-oncological diagnosis in Tübingen. The course followed the concept of blended learning with alternate sessions of online working with patients cases and classroom discussions on subsequent days with a team of clinical experts in the field. On the last day of the course a case-presentation of a living patient was integrated to round up the course. The course was systematically evaluated using an educational framework as outlined in detail by Schäfer *et al.,* [2]. In short this comprised a series of online questionnaires depicting on different dimensions of the educational framework. Furthermore, a specific online tool was applied to assess the degree of immersiveness experienced by the user of the virtual clinic.

By February 2005, formal analysis of the various instruments used for evaluation during this first course on neuro-oncology is still pending. However, some basic results are already evident.

First, technical problems with server failures dramatically interfered with the feeling of presence of the students during the first part of the week thus putting emphasis to the indispensable need for technically stable conditions when using online tools in medical education. Second, the concept of blended learning fully reached the initial goals of the pedagogical concept of knowledge-transfer on the one hand and interactive learning on the other hand. This became evident by an informal assessment of the students during a feed-back session at the end of the course. The students gave an excellent rating for the pedagogical concept of the course, design of the *OncoCase* clinic and performance of the lecturers. Criticism was raised with respect to the rather small number of online-cases provided during the course, and the wish to be provided with a written summary of each case at the end of the day.

This preliminary experience lead us to draw several consequences at this early stage of the program:

First, as soon as results from the systematic online-evaluation are available, these will be considered to further improve functioning and concept of the platform. We consider this to be a crucial part of the continuous adaptive process during the construction of a computer-based teaching program.

Second, the course on neuro-oncology, even though dealing with rare tumor entities far off the mainstream of oncology, was such a great success that it will be integrated into the regular curriculum of the students.

Third, the organizers of the course agreed to integrate *OncoCase* into the education of post graduates in order to improve and ensure systematic training in the field of neuro-oncology. This program will be open to all clinical disciplines involved like neurology, radiation oncology, or neurosurgery. This will be accomplished in a first step by offering the online course to local residents. In a second step, the *OncoCase* clinic is intended to be certified for CME (Continuous Medical Education) credit points by the national medical associations. This step will open the *OncoCase* clinic to a potentially large user group on the one hand while offering neuro-oncological expert knowledge on a nationwide basis.

Conclusions

We have, in short, described the construction of a platform for problem-based learning in medical education in the highly specialized field of neuro-oncology. The platform has been designed following a stringent educational framework. Continuous multi-dimensional evaluation forms an integral part of the system and has successfully been applied in student seminars. Preliminary classroom evaluation of the program with medical students provided excellent ratings for the platform itself as well as for the pedagogical concept of blended learning to which the course was devoted. Encouraged by these promising results we have developed a concept for integrating the system into the local and national program of continuous medical education thus offering expert knowledge as well as the possibility of self-determined evaluation of rare clinical diseases to a broad group of users in their post-graduate training.

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E-ASSESSMENT: INNOVATIVE MODELS FOR EUROPEAN SKILLS ANALYSIS AND DEVELOPMENT

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Introduction

With the rapid advancement of technology and dynamic shifts in the global economy, small businesses throughout Europe now need to respond to changes in their working environments. It is no longer an option for businesses to assume that maintaining traditional skills in industry sectors or occupations will be sufficient for them to remain economically viable. With long established, well defined areas of work becoming increasingly blurred, it is more and more difficult for small businesses to assess whether the skills base of their existing staff is likely to meet their present needs – let alone an uncertain future in which continuing technological progress may be the only certainty.

In Maastricht (December, 2004), representatives of 32 European Union states met to review and determine their future priorities in vocational education and training (VET)[1]. It was agreed that transnational collaboration towards harmonising skills frameworks across an enlarged Europe was of central importance, for which VET should offer:

> *…all Europeans, whether they are young people, older workers, unemployed or disadvantaged, the qualifications and competences they need to be fully integrated into the emerging knowledge based society, contributing to more and better jobs.*

Amongst the reforms proposed by the EU's Interim Report on Education and Training[2] was the following:

> *achieving high levels of quality and innovation in VET systems in order to benefit all learners and make European VET globally competitive*

with priority given to:

> *the use of common instruments, references and principles to support the reform and development of VET systems and practices ... in particular the needs of small and medium sized enterprises, the innovative reform of VET systems ... [including] the development and implementation of open learning approaches, enabling people to define individual pathways, supported by appropriate guidance and counselling… More emphasis on the early identification of skills needs and planning of VET provision is particularly important.*

The report proposed further development of an open and flexible European qualifications framework, providing a common reference point to facilitate recognition and transfer of qualifications based mainly on competences and learning outcomes. The potential contribution of the Leonardo da Vinci lifelong learning programme was noted, to support the development, testing, and implementation of innovative actions to advance VET reform.

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[1] Maastricht Communiqué on the Future Priorities of Enhanced European Cooperation
in Vocational Education and Training (VET): Education & Training, December, 2004. Retrieved on February 1st, 2004 from http://www.trainingvillage.gr/etv/HomePages/Front_page_news/Maastricht.htm.

[2] Joint Education Council/Commission Report on the implementation of the Lisbon Strategy: Education & Training 2010, 19 December 2002, JO C13, p. 2-4, 18.1.2003.

Aims of the Leonardo e-Assessment project

The Leonardo da Vinci programme is taking forward the Lisbon Strategy's recommendations for innovative approaches to recognition and transfer of skills and competencies. As evidenced by recent supplements to the eEurope 2005 Action Plan, there is continuing interest within Europe in developing electronic solutions to make skills visible to an international audience through such mechanisms as eportfolios, to provide electronic records of individual achievements.

The central purpose of the Leonardo e-assessment project complements that of eportfolios by setting up electronic skills frameworks for organisations and sectors, within which individual employees can locate their own competencies and training needs. The project aim is to develop a diagnostic e-assessment tool (assessment software) for small and medium sized businesses (SMEs), through which enterprises can analyse the training and learning needs of individual staff and select an optimal learning strategy within a business and e-business context. Of particular interest to SMEs across Europe will be innovative representations of skills in leadership and management, e-commerce, marketing, communication, innovation, ICT, intellectual property rights, health and safety and equal opportunities.

The resulting learning strategy recommended for staff development and training will incorporate effective use of e-learning, blended learning, on-the-job-learning and informal learning. The e-assessment tool is envisaged to form part of a 'learning strategy model' which describes effective and innovative methods for training and learning, good practice in SMEs and sample benchmark data. Innovative learning methodologies to be embedded in learning strategies offer additional features not available in traditional training, and will include:

- Self-paced online learning (better access, more flexibility, better learning management);
- Simulation and gaming (enriched learning, with greater interactivity);
- Collaborative learning (learning in 'communities of practice'; online and face to face);
- Informal and non-formal learning on the job (using online information sources and knowledge bases).

The assessment process is therefore conceived to address the business context (learning content) as well as the learning context (learning methodology) through the development of appropriate self-guiding software.

The long term goal is to raise the awareness of learning needs and improve the conditions for developing technical, entrepreneurial and management skills for SMEs across Europe. Indirectly, using ICT for learning may stimulate SMEs to become more competent in using ICT for strategic business purposes. According to a European Commission report on policies for business[3], the most important factor discouraging SMEs of all sizes and locations from embracing digital activities is the widespread conviction that e-commerce is not applicable to their type of products, services or markets. By using ICT for competency development, SMEs will automatically develop ICT skills, become more familiar with and prove to themselves the benefits of the new technology.

The project distinguishes between primary and secondary target groups:

- Primary – trainers; training developers; business advisors who work with e-learning and learners in SMEs; employers and employees in SMEs and also larger companies, and
- Secondary – careers advisors in the wider labour market, educationalists and researchers.

The overall target sector for the project is small and medium sized businesses in general, and small businesses in particular.

[3] European Commission. Benchmarking national and regional e-business policies for SMEs. June 2002.

The e-Assessment project implementation

Participants

E-assessment project partners are drawn from many regions of Europe including, importantly, several partners from the new accession countries for whom integration with innovative European policy and practice is especially important. The project comprises a large transnational group of thirteen diverse partner organisations representing a range of sectors, drawn from nine European states:

- *UK* eNovate Knowledge Span, Margate, Kent (SME) – project coordinators, contract and financial managers, Marchmont Observatory, University of Exeter, Devon (university/regional research unit) – research and background studies, tool piloting and dissemination, Surrey Institute of Art and Design, Surrey (higher education college) – project disseminators, and Thanet Community Development Trust (social partners) – evaluating equal opportunities and diversity aspects of the project;
- *The Netherlands* CINOP, s'Hertogenbosch (school and workplace training organisation) – scientific coordinators for tool development;
- *Italy* Selene Consulting, Pinerolo (innovation SME) – lead developers of e-assessment tool, INFOR, Pinerolo (SME training organisation) – engaging SME networks and tool piloting;
- *Germany* Institut für berufliche Bildung und EDV-Schulung, Lauchhammer (SME training organisation) – research, tool piloting and dissemination;
- *Hungary* Chamber of Commerce for Csongrad County, Szeged (regional business development organisation) – tool piloting and network dissemination;
- *Czech Republic* Chamber of Commerce, Ostrava (regional business development organisation) – tool piloting and network dissemination;
- *Lithuania* Distance Education Centre, Kaunas University of Technology (innovative training developer) – research, tool development and piloting;
- *Spain* Chamber of Commerce, Castellon (regional business development organisation) – tool piloting and network dissemination and
- *France* Bernard Dumont, Paris/Montpellier (consultant) – project evaluation.

Method and outcomes

The e-assessment project will be implemented in discrete stages. First, in order to decide on the overall strategy and conceptual framework of diagnostic tool to be developed during the project, it will be necessary to collect and analyse literature, benchmark data and instruments on assessing learning and teaching needs and developing (e)learning methods as well as business related content.

After the survey and research is implemented, the partnership will undertake the development of a conceptual framework and diagnostic tool to assess training and learning needs and select a learning strategy in small and medium sized businesses. For this purpose, evaluation of existing instruments and conceptual frameworks will be undertaken by an international expert group on teaching and learning, their most efficient and relevant functions and roles will be evaluated and necessary adjustments to the project instruments and framework will be made.

After the e-assessment tool for assessing trainers and users' needs is implemented, as a contribution to overall e-learning strategy, it will be tested and evaluated in different countries with different types of enterprises. Report on testing results will allow further improvement and adjustment of the instrument and the tool, as well as its framework. Moreover, good practises and critical success factors for SMEs using innovative methods of teaching and learning (pedagogical approaches, implementation, organisational change, training technical solutions) will be described and published on project website (framework, diagnostic tool, evaluation report, good practises and critical success factors) to be a reference for other teachers and trainers, as well as e-learning organisers and participants.

Co-ordination and communication will be facilitated through the establishment of a virtual workspace which will make all working documents accessible to all partners. The work will be divided within the broad partnership under three main categories content development and research, software development, and testing and dissemination. The partners representing business will focus solely on reviewing the content, testing the software with SMEs within their network and disseminating the results and product. A social partner will provide evaluative support and address issues of equal opportunities.

Conclusions

The e-assessment tool that will be designed during the implementation of Leonardo da Vinci project "e-Assessment" will be a part of a 'learning strategy model' which describes effective and innovative methods for training and learning, good practice in SMEs and sample benchmark data. Innovative learning methodologies will be embedded in learning strategies and will offer additional features not available in traditional training. These will be:

- Self-paced online learning (better access, more flexibility, better learning management);
- Simulation and gaming (enriched learning, with greater interactivity);
- Collaborative learning (learning in 'communities of practice'; online and face to face);
- As well as informal and non-formal learning on the job (using online information sources and knowledge bases).

The project and its outcomes will raise the awareness of learning needs and improve the conditions for developing technical, entrepreneurial and management skills for SMEs across Europe, as well as will serve as a reference and good practice example in VET system and in acknowledgement of vocational qualifications and skills, as envisaged in Lisbon (2002) objectives and Maastricht Communique (2004).

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THE MEC MAP PROJECT: MAPPING MULTICULTURAL COMPETENCIES IN EUROPEAN E-LEARNING

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1. Introduction

With the integration of the European Union, large companies as well as small firms operating in a knowledge based economy rely increasingly on the interrogation of non-domestic sources of information and knowledge bases, and accommodate the particular cultural context of the region or country in order to gain or maintain a market advantage. Also, learning in the workplace increasingly has to take into account the cultural diversity of its workforce, reflecting the multicultural social environments in which businesses are situated. European social partners recognise that the lifelong development of competencies depends on a workforce with skills that include among others "at least a second language, computing skills, ability to communicate, including in a multicultural context, and the ability to learn how to learn".

The MeC MAP (Multicultural e-Learning Competencies Map) Leonardo da Vinci reference project highlights the potential contribution of e-learning to vocational training within an expanding European Union. It is aimed at both employers and employees such as those in small firms who increasingly need to situate their own working practices within a wider global context. The project is particularly timely for those workers from new member countries of the EU for whom employment in other parts of Europe is opening up fresh cultural challenges.

The starting point of MeC MAP is to redress an assumption that the development and roll-out of e-learning in society ignores or inefficiently addresses the increasingly diverse and multicultural dimension of the European society, therefore (unintentionally) contributes to a divisive society. The MeC MAP project aims to tackle this perceived imbalance by producing a study on the multicultural context of e-learning provision to small businesses, which will be underpinned by the establishment of four databases, accessible online:

- e-learning project results and initiatives that have addressed multicultural aspects, particularly in small businesses;
- European organisations key to the introduction and raising of multi-lingual and multicultural e-learning competencies and standards;
- Competences and qualifications of vocational teachers, trainers and technical specialist trainers working with small businesses in a multicultural context;
- Guides and reference material useful to trainers and developers working in a multicultural e-learning context.

In addition the project will aim to visualise European multicultural e-learning contexts through utilisation of clickable map software, linked to the databases and addressing themes such as social exclusion and the digital divide in workbased learning.

2. Project partnership and structure

MeC MAP comprises a partnership of five European nations: the United Kingdom, Germany, Portugal, Slovakia and Finland. Partner organisations committed to multicultural e-learning include:

United Kingdom

- *eNovate Knowledge Span* – a small e-learning consultancy, Margate, Kent
- *Marchmont Observatory and Telematics Centre* – research units under the School of Education, University of Exeter

Germany

- *WTA (Private Wirtschschafts- und Technikakademie GmbH)* – a private sector language training company, Rostock

Portugal

- *CCG (Centro de Computacao Grafica)* – innovative computer systems developers, Coimbra

Slovakia

- *Metodicke Centrum* – a national teacher training agency, Banska Bystrica

Finland

- *AKOL (Aikuiskouluttajien Liitto oy)* – a trade union of adult educators, Turku

The project is structured into six interrelated work packages for which partners share responsibility. They are:

- ***WP1 Project management*** – overall contractual and financial responsibility, intellectual property rights, evaluation, effective communication and transparency, translation of results into partner languages
- ***WP2 Scientific coordination*** – development of robust and valid analytical methodologies, data and interpretation, expert feedback, quality assurance
- ***WP3 Dissemination*** – development of a project dissemination framework to make results widely available, raising awareness of the project and the profile of multiculturalism within e-learning
- ***WP4 Research*** – collection and analysis of data using selected research methodologies, including:
  - mapping of multicultural e-learning projects;
  - identifying key European organisations;
  - establishing key competencies in multicultural e-learning;
  - collating research resources;
  - representing visually (eg in clickable maps) socioeconomic contexts of multicultural e-learning;
- ***WP5 Database development*** – to structure and make accessible mapping and analysis results
- ***WP6 Analysis and reference development*** – to review and report findings within an overview of existing multicultural and e-learning practice, providing a navigational framework for references collected and explore project results at expert and user level.

3. Research and development framework

Of particular European interest within the project has been the development of an analytical research and development framework in which to locate the various resources under compilation within the MeC MAP databases. These have included a review of studies to date which have provided a range of definitions of multiculturalism as well as e-learning. For the latter, we have based our definitions on that within the European Union's eLearning Action Plan[1], updated to take account of newer developments such as hybrid, broadcast and mobile technologies:

> *"E-learning: the use of new multimedia technologies and the Internet to improve the quality of learning by facilitating access to resources and services as well as remote exchanges and collaboration."*

For us the most important elements of the definition were to differentiate between resources (seen as *content*) and services (seen as *infrastructure*) as follows:

Resource based, emphasis on content:

- Readily transferable e-content;
- Principles to make e-content transferable;
- Any content designed for transnational use.

Services based, emphasis on process:

- Multicultural training to enable people to work in different cultures (settings based);
- Multicultural training to enable people to work with people from other cultures (people based).

The resulting framework we have adopted highlights their potential *transferability* between multicultural settings and audiences (local through to international). These act in two directions: to shift e-content for local use towards a wider multicultural audience, or in the other direction – to localise transnational use. We therefore proposed a spectrum of e-content with interactions in both directions, from local resources at one end to transnational resources at the other.

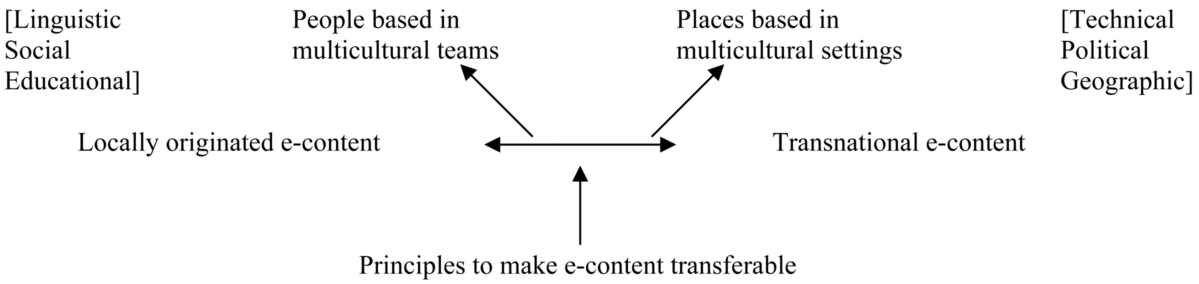

Figure 1. Interactions in multicultural e-learning resources and services

For multiculturalism, the research of several leaders in the field has been particularly instrumental in developing our approach: Chang[2], Banks[3] and Gorski[4]. Chang refers to four different approaches to multiculturalism:

- 'Cultural sampler' approach, often concerned with material culture, to raise appreciation of cultures in other countries;
- 'Cross-cultural competency' approach, to help develop knowledge, attitudes and skills to function in other cultures;

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[1] Communication from the Commission to the Council and the European Parliament (2001) The e-learning Action Plan: Designing tomorrow's education. Brussels: EU Commission. COM(2001)172 final

[2] Chang, H. *Multicultural education for global citizenship: a textbook analysis*, Electronic Magazine of Multicultural Education. Vol 5, No 2, Autumn 2003. (http://www.eastern.edu/publications/emme) (Paper originally presented at 102nd annual meeting of the American Anthropological Association, Nov 2003)

[3] Banks, J. A. (1981). *Multiethnic education: Theory and practice,* Boston, MA: Allyn and Bacon.

[4] Gorski, P. *A working definition of multicultural education,* in: Defining multicultural education, EdChange.org. (http://www.edchange.org/multi-cultural/initial.html)

- ‘International comparison’ approach, to mirror circumstances abroad with those in home countries;
- ‘Global citizenship’ approach, developing sense of responsibility as global citizens.

Of which the ‘cross-cultural competency’ approach most closely matches our own context:

> *Cross-cultural competency emphasizes the importance of helping students develop knowledge, attitude, and skills to function in different cultures.*

Banks argues that an important aim of global education, which is closely connected to multicultural education, is “to help students to develop cross-cultural competency in cultures beyond our national boundaries and the insights and understandings needed to understand how all peoples living on the earth have highly interconnected fates”.

Paul Gorski noted that “the underlying goal of multicultural education [in schools] is to affect social change”. He describes three strands, which we have adopted below into a lifelong learning context as positive educational outcomes for multicultural e-learning: a) Self transformation in knowledge, skills, identity, attitudes, beliefs, enacted in behaviour; b) Educational processes transformation in remote exchanges and collaboration, by facilitating access to resources and services; c) Society – transformation in heightened appreciation of multiculturalism, in the contexts of an enlarged EU and widening participation.

We have borrowed from existing selection criteria frameworks to provide partners with guidelines as to suitability of resources to include in the MeC MAP databases. These include a model for decision support (Naish, Rawling and Hart, 1987) which identifies five stages of selection as follows: observation and perception, definition and description, analysis and explanation, prediction and evaluation, and decision making. We have also adapted an evaluation framework[5] assessing quality and appropriateness of Web based electronic resources, based on essential and desirable characteristics across the following dimensions: purpose (local/transnational, training, competence, project, outcome), content (quality and suitability), process (type of educational interaction, format, delivery), target audience (trainers, developers, end-users) and setting (SMEs, public or private training providers). Combining all the frameworks has resulted in a useful flowchart detailing the successive stages of resource selection and the application of separate filters for inclusion of multicultural and cross-cultural resources.

4. Progress to date

The MeC MAP project is developing well. Selected transnational academic experts have met and provided most useful feedback to guide the various phases of the work programme, including validation of the research and development framework set out above. Of particular value has been experts’ confirmation of the location of the research within academic multicultural studies, including the significant differences between place based (working *in* or cross-cultural) and person based approaches (working *with* or multicultural). The inclusion of identified dimensions of multiculturalism for which data could be gathered (linguistic, social, geographic, technical, political, educational, religious) was also endorsed by experts. Our concept of a ‘clickable map’ approach to presenting these data in map form has similarly been supported, and development work is currently underway to collate information across a huge range of socioeconomic parameters.

A major step forward was taken with the decision to adopt the Dublin Core metadata scheme as a generic database field structure for MeC MAP, with additional fields specified according to the needs of the individual databases. Dublin Core is well used for education datasets within a broad international context, and is flexible enough to make it the natural choice.

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[5] Tweddle, S, Avis, P, Wright, J & Waller, T. *Towards criteria for evaluating websites,* British Journal of Educational Technology. Vol 29, No 3, 1998.

At present project partners are focussing on collecting resources across the specific areas allocated to them for population within the several MeC MAP databases. Resources are cross-validated according to the e-learning and multicultural criteria set out above to guide their suitability for inclusion in the databases. Once collection of content is complete final database development will commence. Plans are for databases to be available for piloting in mid-2005 and be trialed and validated by representative focus groups towards the end of the year, with completion of the MeC MAP reference project due in spring 2006.

In a partnership where all partners are geographically dispersed throughout Europe it is important to provide the means to collaborate efficiently, resulting in a virtual workspace which is an important tool for the project. The project's Web site has also been developed, which is available to the general public (www.mecmap.org).

A MULTIDIMENSIONAL APPROACH TOWARDS PROJECT MANAGEMENT TRAINING IN A DISTRIBUTED SETTING

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This paper outlines the objectives and approach of the Leonardo da Vinci II project POOL. It first explains the background and rationale behind this project and then focuses on the collaboration framework and the process of agreeing on a competency profile in a multinational and multidisciplinary distributed setting.

Project-based training in university-level education has become a vital factor in preparing students for the demands of the labour market. It is also commonly agreed by personnel managers and recruiting agencies that team-working and problem-solving skills as well as communicative competence vitally contribute to the employability of university graduates. While most educational institutions would subscribe to these tenets, curricula, however, often do not reflect these developments. This is especially evident in the engineering sector. Whereas a sound theoretical basis in the knowledge domain constitutes a sinequanon in the curriculum of technical studies, project-oriented skills have only recently made it to the forefront of attention and are not yet well integrated. Looking at this issue from a transnational angle and adding a virtual dimension, further aggravates the disparity between core technical subjects and soft skills training. Additionally, academic traditions within the European Union have put a widely differing focus on the integration of theory and practice, of applied and work-oriented objectives into their curricula. Individual aspects may well have been given attention but it is their integration and well-defined interrelation that will truly reflect today's industry practices. This raises relevant questions that need to be addressed if students should be adequately prepared to meet the challenges in their future workplaces, where international collaboration in a distributed setting has become the norm.

The POOL project undertakes to address these questions in a European context and provide a model for integrating distributed project management training into engineering curricula. What aspects need to be considered when preparing students to work in multinational teams? What European consensus can be achieved across national borders with respect to project organisation, documentation and quality control? What areas provide difficulties and why? What industry and real working life demands can be reflected in project training to ideally prepare students for the labour market? What specific aspects have to be taken into account and what pitfalls have to be avoided, if projects are partly carried out online?

More specifically, the POOL project aims to achieve the following objectives:

- to provide a curriculum model for integrating practical project work into engineering curricula at university- level education using DE and thus;
- to best prepare students to work in multi-skills and multinational teams in a distributed setting;
- to filter out and agree on a set of quality criteria for online project management training in university-level education based on current industry practices and taking into account expected future developments;
- to compare and evaluate practised national vocational/professional requirements/standards for project organisation and management in a distributed environment using distance education (DE);
- to (re)assess the role of high-level academic education in preparing (engineering) students for professional project and team work;
- to (re)evaluate the curriculum development process through the active involvement of and dialogue between university-students-industry;
- to use and evaluate DE and electronic communication in skills acquisition and knowledge building.

The centrepiece of the proposed POOL project is a transnational student project in the field of telecommunications engineering carried out by students under industry conditions (see POOL graphic 1 below). The unique approach trialled in this project is the combination of a real-life university-industry project in combination with the critical reflection and evaluation of the curriculum via the individual work packages accompanying this project. Theory and industry practice are thus synergetically utilised to achieve the most efficient and effective form of training for the engineering students.

The student project serves as the touchstone for all questions to be addressed and considered. All communication as well as documentation is carried out in a virtual learning environment (VLE), in this case WebCT. The active involvement of students and industry partners in the curriculum development and the intended cyclical feedback loops among theoretical input, beneficiary/student experience and industry practice secure the focused and targeted embedding of this form of VET in initial university education.

Social dialogue is indispensable for project management and probably crucial to its eventual success. Thus, the skills and competencies profile of engineering students will be enhanced by providing them with more flexibility to react to the highly dynamic demands of the labour market. Transnational cooperation and training of such new skills will furthermore enhance the mobility in job placements and adaptability to changing workplace requirements. Using this platform with clearly defined interfaces should ensure ongoing collaboration, transparent documentation of work progress and, thus, guarantee smooth project handling. Furthermore, VLE usage in itself will enhance awareness of the sensitive issues involved in online project collaboration. Again it is the interrelationship between theoretical reflection and the simulation of industry practice that provides the innovative approach here.

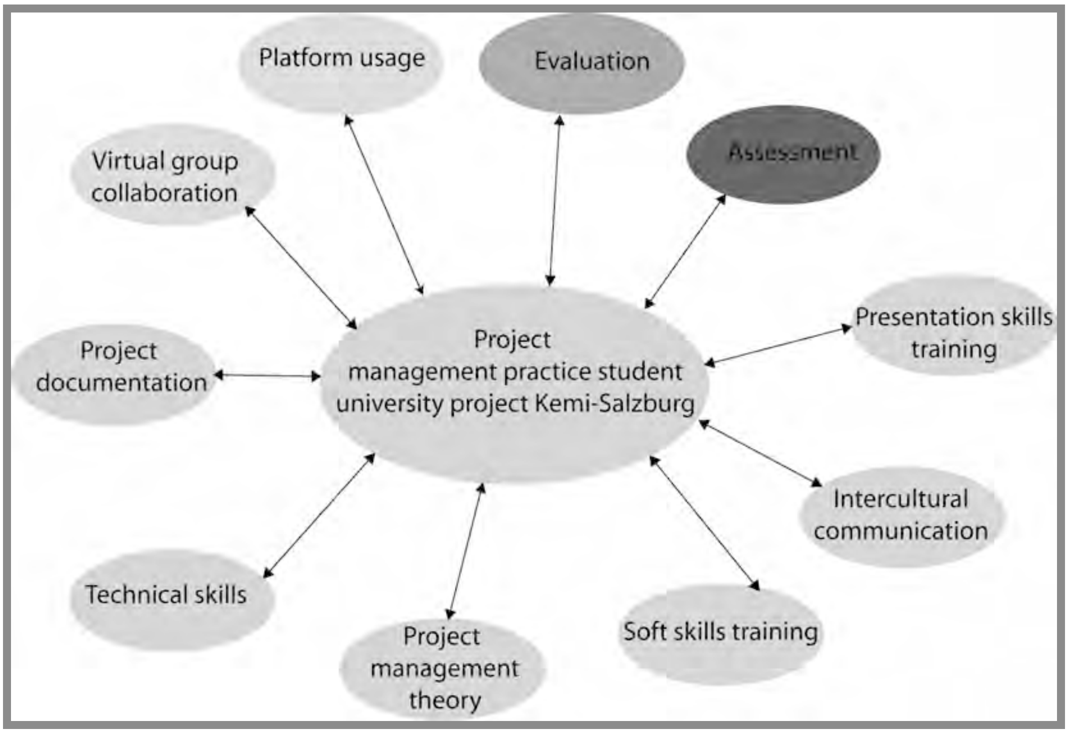

Figure 1. Integrated POOL Approach for Project Management Training in Engineering Education

The POOL project intends to achieve two major outcomes:

First, innovative curriculum design aimed eventually at the main beneficiaries, the students. The work packages centred around and prototypically implemented in the student-industry project will result in independent modules each addressing specific aspects of online project management such as quality assurance, intercultural communication, presentation skills, virtual group collaboration, standardisation of project documentation. Together these will form a model curriculum for online project management training for engineering students. Owing to the modular structure, the resulting curriculum will allow enough flexibility for its concrete implementation in a wide range of higher educational institutions.

Second, the experiences made in the course of this project feed directly into the online handbook. This will serve as a guideline and reference source for curriculum designers at higher educational institutions as well as in companies and will support the implementation of transnational online project management (training). The close cooperation of educational institutions and industry partners in the needs analysis and final evaluation phases will secure the work and practice-orientation.

The set-up of the project consortium including seven universities, two SMEs, and a regional Chamber of Commerce from seven countries will guarantee a valid academic and practice-oriented input so that the resulting curriculum will be beneficial for students as more highly qualified future employees thus increasing the competence and competitiveness of companies operating in transnational and distributed project settings. The number and diversity of partners will give a good cross-section of project management experience and project management training throughout Europe. While the project is carried out within an engineering context, the results will by no means be limited to this field. On the contrary, it is assumed that the basic conclusions arrived at, will be transferable to any online project management training across all sectors.

The POOL project will assist in the reorientation of project training in university-level engineering education from a more technical skills training approach to an integrated one which pays tribute to the developments and needs of the labour market. It will address issues of curriculum design for engineering project management courses at a national and European level, with a view of adopting an approach that caters for the specific needs of both academic institutions and industry. Faced with global competition, it is essential that engineering graduates are equipped with skills and competencies that prepare them for the challenges of a united Europe promoting common quality standards and practices. The innovative approach in the POOL project in integrating currently independent training approaches and complementing these with new ones such as virtual group collaboration should result in role models for innovative training concepts and thus pay tribute to the paradigm shift in modern industry project scenarios. The POOL consortium with its wide range of European academic and vocational training traditions is an ideal setting in which this new approach can be developed and trialled.

The curriculum design will use a skills-based approach to accommodate the special focus on work-orientation. More specifically, competency profiles will be developed that are based on real-life tasks and reflect current work practices. The consultation and involvement of practitioners (industry partners) at the early stage of the needs analysis as well as in the final evaluation phase is a major guarantor for the appropriateness of the training units. The virtual dimension adopted in this project requires using a common model for the definition of competencies as the basis of the curriculum model. Therefore, the POOL consortium has agreed on using the standard Reusable Definition of Competency or Educational Objective (RDCEO) defined by the IEEE Learning Technology Standards Committee (http://ltsc.ieee.org/wg20). The following graphic shows the XML schema underlying this standard.

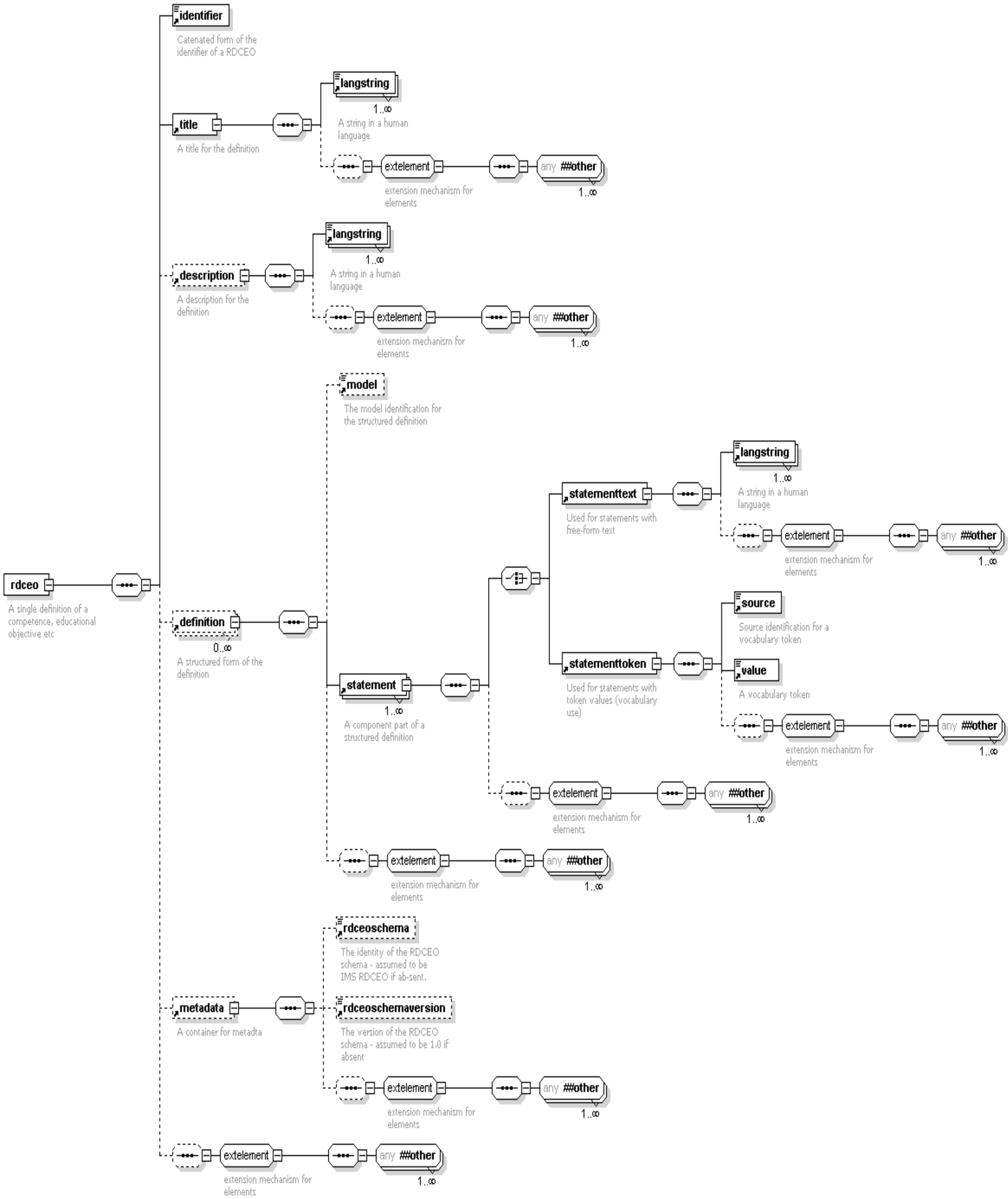

Figure 2. XML schema used as the basis for competency profile template in POOL project (based on http://ltsc.ieee.org/wg20)

Thus, this standard has been integrated into the shared workspace using templates so that each work package which relates also to a particular curriculum component can submit its defined competencies in a common format. It is evident that a core aspect of this model is the clear definition of the competencies categories such as “outcome”, “action”, “criteria” and “ability”, as can be seen in Figure 3. This guarantees a uniform understanding of the statements and thus the competencies across all institutions involved. Otherwise, country and culture-specific educational traditions could result in a number of possible interpretations and connotations.

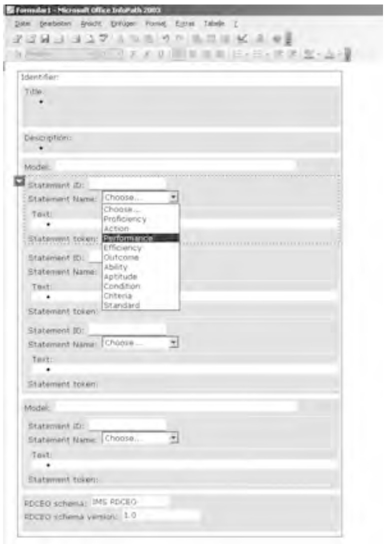

Figure 3. Integration through Microsoft Infopath 2003 for usage in SharePoint

As the POOL approach not only focuses on a multinational view of required competencies for a university curriculum for virtual and transnational project management training but also sees the industry-university dialogue as seminal in curriculum design. Thus, in a second step the relevance of the competencies profile created in each work package is evaluated by selected industry partners in all countries involved again paying tribute to the different business cultures in the various countries. The result should reflect a common denominator for required competencies in this curriculum with a true European dimension. It will be interesting to see whether industry weights competencies in a similar or different manner and whether there are any geographical or other differences. Figure 4 exemplifies the online questionnaire to be filled out by industry representatives.

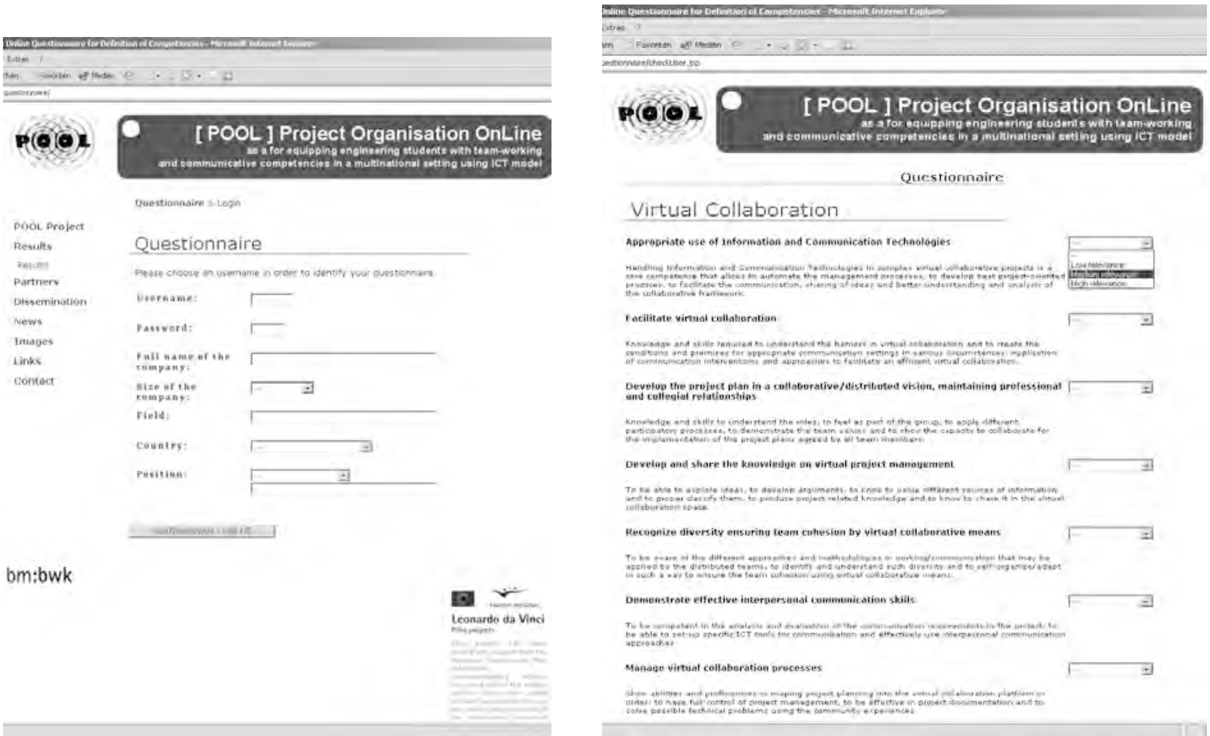

Figure 4. Screenshots of questionnaire with competencies profile

Currently the questionnaire is being completed with outcomes expected in March. It is anticipated that the results of the project feed directly into the curriculum design for engineering project management training first within the consortium partner institutions and in the long run in the scientific community at large. This should enhance the quality of such training as it reflects industry needs across Europe and combines the required academic standards with a practice-oriented and market-driven approach.

Students as the major beneficiaries will enhance their employability by extending their skills profile through the targeted training provided in these modules. Especially the integrated soft skills training will equip them with the flexibility and intercultural competence required in modern project settings.

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E3: ELECTRONICALLY ENHANCED EDUCATION IN ENGINEERING – AN EUROPEAN PROJECT FOR INTERNATIONAL LEARNING OBJECTS

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Introduction

This project builds on the experience of the partnership in using the Internet to complement and enhance the learning experience within a high level engineering discipline, at a post-graduate level.

The development of this project was based on the unsatisfied need of electronical courseware for the post-graduate level of engineering courses. For the undergraduate levels, there are plenty Learning Objects (LOs) available, probably motivated by the large number of students that attend these courses worldwide. Also, LOs for the post-graduate courses are more difficult to develop and tend to have a shorter shelf-life than the undergraduate courseware, since usually they deal with more recent and innovative concepts.

This project developed and tested innovative forms for the display and manipulation of learning materials. That is, they developed 'learning objects' to be used in post-graduate courses and tested the possibility of their reutilization in different circumstances. Learning objects were based on existing techniques such as streamed video and audio presentations, animated simulations and interactive applets.

The objects were developed by the lecturers who also developed the related pedagogical procedures that allow their effective use by the learners. These learning objects and pedagogical procedures are generic in nature and were tested and demonstrated with specific high level courses in engineering.

The Project

Aims and Objectives

The approach developed by the partners is to enhance the learning experience of a training programme by making available specific material, aimed at core concepts and underlying technologies, accessible at a distance. In this way, the students can access the material at their leisure and can subsequently attend an otherwise conventional course delivered in a much smaller time frame than previously possible.

The major objectives of the project are:

- To develop and test learning objects and related pedagogical procedures that will enable the use of the Internet to complement and enhance the learning experience of participants in high level engineering and scientific disciplines.
- To reduce the face-to-face time required in teaching and to increase the effectiveness of the learning within high level engineering and scientific courses.
- To test the use of the developed system by applying it to existing courses of study within the partner institutions and to prove the effectiveness of the approach.
- To test the feasibility of teaching parts of a high level engineering programme using teachers from partner institutions in other states, delivering materials and tutoring using the Internet supported by face-to-face problem solving using indigenous tutors.
- To demonstrate the effectiveness of the approach to colleagues in the partner institutions, to engineering and science departments of other institutions and to the world of learning in general.

Innovation

This project will develop and test innovative forms for the display and manipulation of learning materials. The major innovation is two-fold:

- Firstly the approach to providing distance learning to relatively small groups of people, which is centred on the concept of electronically enhanced learning rather than distance learning. This enables us to select from the learning materials only those that are most readily delivered remotely without having to face the problems of delivering other aspects of the learning in the same manner.
- Secondly our concentration on learning objects which are small packages of learning which can be knitted together with other packages and with conventional teaching to form a coherent course that can be delivered partly at a distance and partly face to face.

Outputs

This project produced the following outputs:

- Learning objects developed by one of the transnational teams.
- Pedagogical recommendations for the use of the LOs.
- State of the art reports in relation with each type of LOs.
- Guidelines for the use of the LOs.
- Web-site with the LOs embedded within one or more courses.
- Final evaluation reports in the languages of the partners.

Partnership Composition

Cranfield University, United Kingdom is the lead partner. It is a Higher Education establishment and a Centre of Excellence in post-graduate teaching in Engineering and Management. Its legal status is an 'Exempt Charity'. There are approximately 1,000 academic staff on the Cranfield campus. They have a significant presence in Mechanical Engineering and deliver a wide range of programmes for Continuing Professional Development (CPD) of graduate engineers. They have just completed an ADAPT project during which they developed the software shell which was used to offer an 'online course companion' to engineers following their CPD programme. They have developed some expertise in the use of the Internet to assist in the delivery of short programmes. Their associates at 'Learning Materials Design' bring a long track record of designing and implementing web-based distance learning solutions for a variety of clients in the Higher Education and the CPD fields.

Linköping University, Sweden is a University with 3 faculties – engineering, medicine, arts and sciences. They have more than 3 000 employees – 2 500 full-time equivalents. They teach 22 000 students. Linköping are pioneers in the use of technologies for distance learning and have 25 people (full-time equivalent) directly involved in ICT for learning. They bring an unrivalled expertise in the pedagogy of distance learning gained from nearly fifteen years working in the field. They have also considerable experience of the design of learning objects for implementation using CD-ROMs and digital television.

ESTIA, France is a School of Engineering supported by the Chamber of Commerce and Industry of Bayonne Pays Basque. ESTIA is a school of engineers, specialized in industrial technologies and information technologies, supported by the Chamber of Commerce and Industry of Bayonne Pays Basque.

Inside ESTIA, there is a special business centre, dedicated to high tech start-up companies. It has specific expertise in Information Technology and Software Engineering, and has had a long relationship with Cranfield. They have developed expertise in video-conferencing and using the Internet as a support mechanism for students. They have also participated in a range of conferences and seminars in e-learning and web TV. They have considerable experience of transnational co-operation in Europe.

Universidade do Porto, Portugal. Nowadays, the Faculty of Engineering is the largest Faculty of the University, with about 5,150 students and more than 400 lecturers, of whom about two thirds hold a doctoral degree. It has eight undergraduate degrees, specialisation courses, awards 21 Master's Degrees and Doctoral Degrees in eight scientific areas. It is involved strongly in e-learning and has a special department for the support of staff. The Faculty is partner or co-ordinator in several projects such as the 'Luvit' learning environment. It is involved in lifelong learning initiatives and has a Continuing Professional Development centre. The University of Porto has been investing quite intensively in the last years in Continuing Education. A large part of the effort has been to train its staff giving opportunity to attend several seminars and courses organised by the university. Three examples of these initiatives are the evaluation performed by the CRE-EUA on the ICT strategy, the Office for Support of ODL and the collaboration of several international experts.

Learning Objects Descriptions

Multiphase Flows and their Measurements, developed by Cranfield University

This PowerPoint Presentation provides students with an overview of multiphase flows and their measurement by: the identification of the nature of multiphase and multi-component flows; the provision of examples where such flows occur; the specification of the factors which are used specify the parameters of such regimes (volumetric flowrates, mass flowrates, phase densities, void fraction); providing video clips which show the different flow regimes which can occur in horizontal and vertical pipe flows; examining the performance of single phase flowmeters in multiphase flows and identify three methodologies – partial separation; homogenisation and neural network methods – which are used in the measurement of the flows of oil/water/gas flows.

Support for Numerical methods for Differential Equations, developed by Cranfield University

This object supports students in revision classes (including remote classes linked via web/video-conference). This topic requires the ability to develop, manipulate and display advanced symbolic and mathematical expressions. This can be complex and is difficult to achieve effectively. The object will encapsulate state-of-the-art methods for doing this and evaluate its effectiveness.

Manufacturing Planning and Control Workbench, developed by University of Linköping

The Linköping learning object is a workbench for manufacturing planning and control in a job shop environment. A commercial manufacturing planning and control (MPC) system is running a fictitious factory realised by a simulation model.

The simulation model is operated through order releases by the MPC system and the simulation model provides the MPC system with status reports to facilitate. The objective of the exercise is to let the participants control and plan the manufacturing in the simulation model through the MPC system. The manufacturing process in the simulation model is subject to disturbances such as machine breakdowns, product scrapping, materials shortages, etc. The participants face the problems and solve them by means of the MPC system.

The participants will be familiar with a realistic planning environment and be able to see (and foresee) the effects of the planning actions in the modelled factory.

Safety in Construction, developed by University of Porto

This Learning Object addresses the issue of safety on construction sites. It uses two different approaches, one for engineers and another one for foremen. The first approach addresses the safety using text based materials like papers, presentations and interactive quizzes. The second approach uses a rich interface, animations and simulations to illustrate the risks and hazards present on construction sites. It also includes safety precaution measures, safety checks and First Aid procedures.

The learning objectives are:

- recognize hazardous procedures;
- understand the importance of precaution measure;
- identify protective equipment;
- apply correctly precaution measures.

Mechanical Testing, Developed by University of Porto

The Engineering e-learning module looks at mechanical response of materials under the action of external forces and is based on laboratory experiments. It is split into two experiments: the tensile test (the most relevant characteristics of the stress-strain curves will be described) and the hardness test. The learning objectives of this module are the understanding of the various mechanical properties, how they are measured and what they represent. After studying this module, the user should also be able to associate the test method used with the type of mechanical property to be measured and understand the manner in which this property is determined from test data.

Workflow Management into Product Data Management (PDM) System, Developed by ESTIA

The aim of this learning object is to use and to configure a PDM system and especially its workflow engine in order to be able to participate in large design projects, to collaborate with other designers and to manage product data.

Based on Windchill (PTC) PDM system, the different steps cover the creation and the modification of a document using pre-defined life cycle and workflow, then the study of workflow and life cycle definitions and configurations, and finally an overview of the PDM integration methodology in a company.

Distributed Architectures Models for Industrial Information Systems, Developed by ESTIA

The aim of this Learning Object is to allow students to achieve knowledge and techniques in order to be able to evaluate proposed client-server architecture due to the functional specifications of an enterprise information system.

From the Need to the Functional Specifications – Tools and Methodologies, Developed by ESTIA

People dedicated to Product Design should be aware of the consequences from a bad Functional Analysis such as users' damage, financial loss, etc. This Learning Object is useful for every people dedicated to Design. The educational purpose is to give student a view of the necessary tools and methodologies to transform a Need into Functional Specifications. At the end, the student will be able to elaborate Functional Specifications based on a precise Need by using Functional Analysis methods, within a workgroup.

Implementation of the Learning Object – Safety in Construction

As described above, this LO was developed considering two very distinctive target audiences: engineers and foremen. These two groups are very different in the way they learn and also in the way they relate to the computers. The particularities of each group were considered very carefully during the development phases and resulted on two different approaches of the same subject.

Safety in Construction for Engineers

The LOs developed for the engineers consisted essentially on text based LOs (PowerPoint presentations, Word Documents, and PDFs) developed with a previously defined structure that matched the pedagogical approach chosen for the evaluation of the LOs: Pre/post test. Each LO included three components: the pre-test (a quiz), the content (several text based objects) and a post-test (a quiz).

These LOs were integrated and tested on two editions of a Post-Graduated course at the School of Engineering of Universidade do Porto.

The LOs were included in an e-learning management system – LUVIT – that allowed not only the controlled distribution of the courseware but also provided tools for the development of some components for the assessment and evaluation processes (quizzes, evaluation questionnaire, usage statistics). The LOs were made available on-line for the students gradually, first the pre-test (classroom), followed by the content (distance) and finally, one week later, the post-test (classroom).

This approach was considered adequate considering that the target-audience, post-graduate students, is highly literate and have the necessary computer skills to perform the tasks. Also, the nature of this content, which consisted on legislation, best-practices, papers, etc. adapts easily to the type of structure adopted.

The implementation of these LOs was included as a case study for another project concerning the evaluation of LOs "Benchmarking of LOs" presented on the EDEN 2004 Annual Conference.

Safety in Construction for Foreman

The development process of the LOs for the foreman was very complex and went through different stages and approaches. This complexity reflects the complexity of the problem that had to be solved to deliver this particular content to this target audience:

- The content is critical for the target audience and we had to ensure that it was passed on very clearly.
- The content has a high level of semantic density and the target audience has a low level of literacy and computer skills.

The first approach included essentially HTML pages with short texts and images. From this approach the process evolved gradually to the final version of the LOs that is a Multimedia CD-ROM developed using Macromedia Flash. This CD was designed considering the low computer skills of the target audience and allows an autonomous use of the contents. Also, complex content was broken apart and made more accessible with the support of animation, images and audio.

This LO was used and tested with foreman working in construction companies.

Safety in Construction – the E-book

The final stage of this process was the development of an E-book about Safety in Construction that aggregates contents from the two families of LOs described above and also contents developed specifically for this project. The E-book includes several text-based contents and animations and also an on-line component.

This project alone is a good example of the reutilization potential of LOs.

Safety in Construction – International Evaluation

One of the aims of the E3 project was to test the LOs effectiveness in patners organizations. The Safety in Construction LOs were tested by a teacher of the Cranfield University but this evaluation process has not finished yet.