VIRQUAL

Virtual Mobility and European Qualification Framework

The Use of Learning Outcomes in the EHEA: Status Quo and Future Perspectives

VIRQUAL Project

WP 7 / SIG 3
E-Learning and Evaluation of Learning Outcomes

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1 What are the objectives of dealing with learning outcomes in the context of VIRQUAL?

VIRQUAL is a project in the lifelong learning programme of the EU, started in 2009 to promote virtual mobility amongst European students and lifelong learners – according to the policy of the European Union. One of the four general project objectives requires:

> "To elaborate, implement, make available and disseminate tools to analyse, support, manage at Institutional level, contributing to improve the Virtual Mobility in Europe while trying to implement EQF requirements."

Summarised this means: the central goal of VIRQUAL is to improve virtual mobility. The implementation of EQF requirements is a means to reach this goal.

For being able to discuss the correlations between virtual mobility and EQF we will have to define the central ideas.

1.1 Virtual Mobility

One of the most commonly used definitions of virtual mobility in the context of EU is the following:

> "Virtual Mobility is the use of information and communication technologies (ICT) to obtain the same benefits as one would have with physical mobility but without the need to travel"
>
> [Source: http://www.elearningeuropa.info/main/index.php?page=glossary&abc=V]

More detailed the Lifelong Learning Programme 2007-2013 - Glossary defines:

> "A complement; or as a substitute to physical mobility (Erasmus or similar) in addition to a type of independent mobility which builds on the specific potentials of on-line learning and network communication. It may prepare and extend physical mobility, and/or offer new opportunities for students/academic staff who are unwilling or unable to take advantage of physical mobility. It involves the development of virtual mobility for academic staff. It means that full academic recognition is given to the students for studies and courses based on agreements for the evaluation, validation and recognition of acquired competences via virtual mobility. In this context, cooperation agreements are key to ensuring sustainable mobility schemes."
>
> [Source: http://ec.europa.eu/education/programmes/llp/guide/glossary_en.html]

For the purposes of VIRQUAL and the research interests of WP7/SIG3, dealing with the evaluation of learning outcomes, the crucial question is the following:

- How can full academic recognition of competences acquired via virtual mobility be facilitated?

1.2 What is the European Qualifications Framework (EQF)?

A simple and thus most useful description is given by WIKIPEDIA:

> "European Qualifications Framework (EQF) is a European Union initiative to create a translating facility for referencing academic degrees and other learning qualifications among EU member states. It is designed to allow national qualifications frameworks, (…), to be cross referenced. The EQF was formally adopted by the European Parliament and the Council on 23 April 2008.
>
> The EQF is a common European reference framework which links countries' qualifications systems together, acting as a translation device to make qualifications more readable and understandable across different countries and systems in Europe. It has two principal aims: to promote citizens' mobility between countries and to facilitate their lifelong learning. The EQF has eight reference levels. The learning outcomes on these levels are depicted in the following table.

Level	Knowledge	Example(s)
Level 1	Basic general knowledge	
Level 2	Basic factual knowledge of a field of work or study	lower secondary school
Level 3	Knowledge of facts, principles, processes and general concepts, in a field of work or study	
Level 4	Factual and theoretical knowledge in broad contexts within a field of work or study	Abitur, vocational school
Level 5	Comprehensive, specialised, factual and theoretical knowledge within a field of work or study and an awareness of the boundaries of that knowledge	
Level 6	Advanced knowledge of a field of work or study, involving a critical understanding of theories and principles	Honours Bachelor
Level 7	Highly specialised knowledge, some of which is at the forefront of knowledge in a field of work or study, as the basis for original thinking and/or research Critical awareness of knowledge issues in a field and at the interface between different fields	Masters, vocational university (Fachhochschule) Masters
Level 8	Knowledge at the most advanced frontier of a field of work or study and at the interface between fields	Doctorate"

[Source: http://en.wikipedia.org/wiki/European_Qualifications_Framework; visited 2009-10-26]

The definitions of virtual mobility and EQF given above build the framework for goals and efforts of VIRQUAL. Regarding the levels of the EQF the crucial question has to be formulated anew:

- Can full academic recognition of competences acquired via virtual mobility be facilitated by implementing EQF requirements?

The answer, at the moment, seems to be no.

1.3 The EQF requirements are insufficient for virtual mobility. Why?

If two individual curricula have to be compared in terms of learning outcomes on EQF's level of abstraction this will soon be regarded as impossible because the descriptions of EQF are much too abstract for this purpose. E.g.: Where does "comprehensive, specialised, factual and theoretical knowledge" (level 5) end and where does "advanced knowledge of a field of work or study" (level 6) begin? Or what is "highly specialised knowledge" (level 7) in comparison to "knowledge at the most advanced frontier" (level 8) in a concrete field of work or study?

Such definitions are matter of individual interpretations and thus source of ongoing misunderstanding and conflict. The EQF – and in consequence the different national qualifications frameworks – are at the moment a political compromise and instrument for further development, but not an operationalised tool for comparison of the outcomes of formal (and even less of informal) learning processes and mutual recognition of certificates and degrees. Institution A cannot rely on the fact that institution B (independent of the respective country) does interpret the formal descriptions of EQF and/or NQF in an identical way.

This is the reason why institutions need bilateral "agreements for the evaluation, validation and recognition of acquired competences via virtual mobility. In this context, cooperation agreements are key to ensuring sustainable mobility schemes." [The Lifelong Learning Programme 2007-2013 – Glossary]

Bilateral agreements between hundreds of institutions hold two major disadvantages.

- They require a tremendous investment of time for individually negotiating matters that could be standardised.
- And they lead to an inhomogeneous and intransparent landscape of bilateral agreements.

Thus the working assumption of VIRQUAL's WP7 is:

- The consequent adoption of learning outcomes for curriculum design at all European HE&CE institutions will allow for standardisation of many processes of mutual recognition in virtual (and physical!) mobility which now have to be managed by bilateral agreements.

2 What are and for what purposes do we need learning outcomes?

An outcome, in its dictionary definition, is a final product or end result. Adam (2004) defines learning outcomes as the achievements of the learner rather than the intentions of the designer. Learning outcome and learning objective is distinguished at this point. According to Adam "learning objectives and aims are concerned with teaching and the teacher's intentions whilst learning outcomes are concerned with learning" (Adam, 2004). Moreover, to clarify the relation, Gronlund (2000, p.5) characterises learning objectives as "intended learning outcomes".

The ECTS defines learning outcomes as "statements of what a learner is expected to know, understand and/or be able to demonstrate after a completion of a process of learning" (EU, 2004).

We need learning outcomes to measure the effectiveness of the teaching/training process. On the other hand, they are the first step of instructional planning. "If intended outcomes are defined, then the teacher (or the designer) can select related materials and methods of instruction" (Gronlund, 2000, p.9).

Learning outcomes are (a description of) the abilities of learners after having gone through a planned (formal learning) or spontaneous learning process (informal learning); they can be defined on different levels.

- "A programme learning outcome is a statement of what the learner is expected to know, understand or be able to do on successful completion of the entire programme. (…)
- A module learning outcome is a statement of what the learner is expected to be able to do on successful completion of the module in order to demonstrate their knowledge, understanding, skills and/or competences" (Bowe & Fitzmaurice, 2004, p.2).

2.1 The relationship between learning outcomes and competences

Learning outcomes are often used synonymously to competences. This is acceptable to some degree, but for a thorough discussion and for mobility purposes we need to analyse and define the exact relationship between both constructs.

> "The relationship between learning outcomes and competences is a complex and contested area; the subject of some debate and no little confusion. 'Competence' and 'competences' are often used in association with learning outcomes in a number of ways. 'Competence' can broadly refer to aptitude, proficiency, capability, skills and understanding, etc. A competent person is someone with sufficient skills and knowledge and capabilities.
>
> However, some take a narrow view and equate competence just with skills acquired by training. It should be recognised that there is no common understanding or use of the term and the matter is further complicated when apparently similar terms are

> used in translation. (…) therefore the development of a common terminological understanding should be encouraged" (Adam, 2008, p.7).

On the basis of Adam's distinction of a broad versus a narrow view on the concept "competence" we strictly recommend to take the broad view and define:

> A competent person is someone with sufficient skills and knowledge and capabilities to solve defined problems.

The equalisation of competences with skills in a narrow sense would lead rather to confusion and misunderstanding than to clarification.

2.2 What can learning outcomes be used for?

The applicability of learning outcomes is not limited to matters of mobility but expanded to the whole educational business. Adam (2008, p.8) titles chapter 3 of his paper with "The Place of Learning Outcomes in the Bologna Process" and describes 6 functions:

> *Learning outcomes and qualifications frameworks:* (…)Their main role here is to provide explicit and transparent level descriptors and qualifications descriptors. (Adam, 2008, p.10)
>
> *Learning outcomes and lifelong learning:* (…) In higher education lifelong learning is often confined to the recognition of non-formal and informal learning together with policies to widen participation via non-standard admission and the recognition of prior learning. It is clear that these areas often depend on the usage of learning outcomes as the means to identify and evaluate learning wherever it has taken place. (Adam, 2008, p.11)
>
> *Learning outcomes, credits, workload and credit systems:* (…) Credits expressed in terms of learning outcomes are a powerful way to recognise and quantify learning achievement from different contexts; they also provide an effective structure for relating qualifications to each other. The addition of the learning outcomes dimension has the potential to improve dramatically the effectiveness of ECTS as a true pan-European framework. (Adam, 2008, p.11)
>
> *Learning outcomes, mobility and recognition:* (…) The whole area of academic and professional recognition is likely to be transformed by transparency that the adoption of learning outcomes brings to qualifications and qualifications frameworks. *Improvements in recognition with simplified and accurate decision making must in turn facilitate mobility of students, staff and programmes of learning.* (Adam, 2008, p.12)
>
> *Learning outcomes and curricula reform:* (…) Learning outcomes are key tools in the shift towards student-centred learning as they focus attention on explicit and detailed statements of what students learn – the skills, understanding and abilities we seek to develop and then test. (Adam, 2008, p.12)

> *Learning outcomes and quality assurance:* Quality assurance benefits from the adoption of learning outcomes via the resulting improvement in transparency and comparability of standards between and within qualifications. Outcomes-based qualifications should possess greater credibility and utility than traditional qualifications. Quality assurance plays an obvious and important role in creating the European Higher Education Area, increasing mutual trust and confidence between those in different educational systems. (Adam, 2008, p.13)

Central for the purposes of virtual mobility are the connections between learning outcomes and qualification frameworks, credit systems and mobility & recognition. But for strategic reasons also the three remaining topics will be relevant: lifelong learning, curricula reform (or design) and quality assurance. Curriculum design in particular could benefit to a very high degree from adoption of learning outcomes. Logically and psychologically each competence identified as learning outcome of one specific learning process transmutes into an enabling competence for other learning processes with continuative intended learning outcomes.

Thus transparency could also be improved for designers, teachers and students of a specific curriculum, making clear in detail which learning outcomes / competences have to be already achieved when beginning to study for the next level(s) of competence. This is a big difference to the description of content a student has to have dealt with before being able to deal with continuative content. What a student learns when dealing with specific content can differ to a very high degree in range and quality. Let us take e.g. the multiplication table: it makes a big difference if a student knows how to multiply numbers (the operational laws of the process) or if he/she knows the results of 1x1 to 20x20 by heart.

2.3 (Virtual) Mobility depends on mutual trust

The question how the learning outcomes of studying abroad can be recognised is crucial for the promotion of (virtual) mobility. Content, workload (ECTS), and local assessment seem not to be sufficient descriptors to establish a level of trust high enough to allow for automatic recognition of certificates gained abroad. This is, indeed, to some degree rational: not because some universities produce poor quality regarding the competences of their students (which might also be an argument). The crucial reason is the lack of information value. The statement: students had to deal with a specific contend for a defined number of hours on the one hand, and the local assessment on the other hand do not provide a valid and – from the subjective viewpoint of a sending institution – trustable documentation of student's competences. Thus bilateral agreements are needed.

In contrast to this insufficient situation the adoption of learning outcomes would provide sufficient information. By the description of intended learning outcomes according to the state of art ("On successful completion of this module the student will be able to …") assessment criteria and modalities are more or less pre-defined.

Learning outcomes are quasi the genetic code of education determining both, the rough design of teaching and the modes of assessment. If the intended learning outcomes cry for problem solving competences you cannot successfully teach them exclusively by lecturing or validly assess them exclusively by elementary multiple choice tests. These learning outcomes demand active learning respectively learning by doing on the one hand and practical forms of assessment on the other hand. Choosing the precise design of both, the learning process and the assessment is still up to the individual institution and/or teacher. But the framework is fixed by intended learning outcomes.

From this point of view clear, sufficiently detailed, and – as far as possible – standardised descriptions of learning outcomes in combination with adequate assessment procedures can be assumed as one of the main promoters for (virtual) mobility with respect to both, students and institutions. Students would be enabled to make a pinpoint choice of educational offers which meet their needs perfectly and reliably. Additionally the administrative costs of recognition could be reduced to a minimum. Institutions on the other hand could rely on the certified competences achieved abroad and handle them in the same way as internally achieved ones – again with minimal administrative effort.

The solution seems to be rather clear and easy up to this point of consideration. However, its implementation all over Europe could still shape as an enormous problem. It is the ambition of the work in SIG3 "E-learning and evaluation of learning outcomes of EQF" of the VIRQUAL project to add a significant contribution to its solution.

3 The shift to learning outcomes at European universities

The formal structure of study programmes (bachelor / master) as well as the learner centred and outcomes oriented approach build the core of the Bologna process. The structure has been made obligatory by European – and in consequence – by national law. The *adoption of learning outcomes* on the contrary is in many countries matter of the decisions of individual universities. This situation lead to a "multi-speed Europe regarding higher education reform" (Adam, 2008, p.7).

3.1 Current situation in the European HE&CE system – a short overview

A very instructive and compact overview to the overall European situation is given by Stephen Adam (2009, p.9) and quoted here in extracts:

> "The most highly developed systems – that use learning outcomes as a basis of their qualifications frameworks, level descriptors, generic qualification descriptors, subject descriptors and at the level of individual modules – exist in Scotland and Eire. It is no coincidence that these are the first two countries to have successfully

undertaken the Bologna self-certification process where their national qualifications frameworks were articulated against the overarching framework of the qualifications of the EHEA. (…)

In addition to Scotland and Eire, England, Wales and Northern Ireland have well established systems that have pioneered the higher education use of learning outcomes. Belgium, Croatia, Denmark, Estonia, Hungary, Italy, Moldova, Portugal, Romania, Spain, Sweden and Switzerland are making rapid progress towards a more comprehensive implementation of learning outcomes.

Progress on mainland Europe is often initially being achieved by national legislation. Such top-down measures need to be matched by bottom-up activity. (…) while many countries have begun to use credits for transfer and for accumulation, a much smaller number currently link credits with learning outcomes. The European Credit Transfer and Accumulation System (ECTS) clearly requires the use of learning outcomes, but progress is slow to date.

Overall, official reports indicate positive but slow progress in the national and institutional adoption and implementation of learning outcomes. (…) Such innovations, if to succeed at the first attempt, require careful and slow implementation."

3.2 The specific situation in German speaking countries

For more detailed information we conducted a survey among universities in German speaking countries which do not belong to the forerunners, according to Adam. By means of an e-mail based survey among vice rectors, vice presidents and other persons responsible for teaching at European HE institutions we tried to achieve both, to promote the idea of learning outcomes-based planning and to get a picture of the current situation in this countries by asking the following questions:

A Does your university explicitly use learning outcomes (instead of learning objectives, content, etc.) as starting point for didactical planning of new or revised programmes and modules?

If yes:

B Are you obliged to do so by (national) law or other (national or other political) regulations?

C Do you have detailed instructions or guidelines for writing learning outcomes (comparable to attachment: DIT Learning Outcomes Guide)? (If yes, could you make them available for us?)

If no (for A):

D What do YOU take as starting point for didactical planning? (Learning objectives, content, anything else?)

E Are you planning to shift to learning outcomes within the next two years?

3.2.1 Sample and Return Rate

During the summer months in 2009 two thirds (N=92) of the vice rectors, pro-rectors, vice presidents and other persons responsible for teaching (on the institutional level) in Austria (N=21), Germany (N=70) and Switzerland (N=11) were personally contacted by e-mail. Eleven of them (12%) returned an answer. For details see table 1.

	(1) Universities total	(2) Universities contacted	(3) Universities answered
		total / % of (1)	total / % of (2) // & of (1)
Austria	22	21 / 95%	3 / 14% // 13%
Germany	102	70 / 69%	6 / 9% // 6%
Switzerland	12	11 / 92%	2 / 18% // 16%
total	136	92 / 68%	11 / 12% // 8%

The return rate is, on the one hand, rather poor; probably due to the holiday season. (Nearly as often as an answer we received a notice of absence.) On the other hand the information we could gather from these 11 universities is consistent with our expectations according to literature and first of all sufficient for drawing practical conclusions. Nevertheless the plan was (and still is) to contact all European countries and all HE institutions (universities, private universities, universities of applied sciences / “Fachhochschulen”, “Pädagogische Hochschulen) for both, research and dissemination purposes.

3.2.2 Results

The answers of eleven universities from Austria, Germany and Switzerland result in the following raw data:

Country / University	A: explicit use of LOs	B: obligation to use LOs	C: guide-lines for LOs	D: instead of LOs	E: LOs within 2 years
AT / Graz / Uni	Yes	Not yet	Yes,	---	---
AT / Linz / Art & Design	Not yet	Not yet	---	1) content; 2) objectives	will take more time
AT / Salzburg / Uni	No	---	---	Learning ojectives, qualifications, competencies	Yes, according to law from August 2009
CH / Geneva / Uni	No (just some faculties	---	---	---	---
CH / Lausanne / Uni	No	Yes	Work in progress	content and/ or objectives	Yes
DE / Bayreuth / Uni	Yes, sometimes	No	No	---	---
DE / Braun-schweig / TU	Yes	not by law, only by AA	No	---	---
DE / Bremen / Hochschule	Yes	Yes, for (re-) accreditation	Yes	---	---
DE / Duisburg-Essen / Uni	Yes	(only) for accreditation	---	---	---
DE / Hamburg / Verw.Uni	Yes	Only indirect, for (re-) accreditation	No	---	---
DE / München / TU	Yes	Yes	Yes; 2 pages	---	

Table 2: Raw data of survey in German speaking countries

3.2.3 Interpretation of results

Question (A) Use of learning outcomes

According to Adam (2008, p.9) the German speaking countries (except Switzerland) do not belong to the leading nations as respects the application of learning outcomes in HE institutions. If we look at the results of our survey, particularly concerning Germany, this situation seems to be changing. Even if we admit that these results might not be representative (universities which are able to report positively could be

higher motivated to reply than those only able to report a lack of development) this feedback seems to be significant: German universities – and to a lower degree also Austrian and Swiss universities – are beginning to deal with the shift to learning outcomes for purposes of curriculum design and didactical planning.

Question (B) Obligation to use learning outcomes:

Even more interesting are the reasons given for this development. Fife out of the six German universities are not (or do not feel) forced by law to apply learning outcomes. They react to the requirements of accreditation agencies. Thus their concern to compete on the academic education market seems to be a sufficient motivation for this cultural change that could be able to bring a lot of friction into the system.

Question (C) Guidelines for writing learning outcomes:

The most important result in the context of VIRQUAL's goals is: The professional foundation of using learning outcomes for curriculum design and other didactical planning purposes is at the moment rather poor. Only three (of 11 answering) universities have or use specific guidelines for this purpose. And this material is, in comparison e.g. to the "Guide to Writing Learning Outcomes" used at Dublin Institute of Technology (Bowe & Fitzmaurice, 2004), of moderate quality. Most notably, the terminology is partly too diffuse to discriminate between learning outcomes and traditional (teacher centred) learning objectives.

For sure it is difficult to write such guidelines in an acceptable and useful manner for different target groups. However, it will be crucial to have easily usable tools and devices for fulfilling the complex and challenging tasks of curriculum designers and teachers – particularly under the conditions of a paradigm shift.

Question (D) Alternatives to learning outcomes:

No at all surprising are the (traditionally) applied alternatives to learning outcomes for curriculum design and didactical planning: mainly content and objectives. Those universities using objectives can perhaps be motivated with less effort to shift to learning outcomes than those still using content.

Question (E) Shift to learning outcomes within 2 years:

Three of the four concerned universities (two from Austria, one from Switzerland) answered this question. The Austrian statements are heterogeneous. The University for Arts & Design in Linz claims more time and expresses strong scepticism against the new paradigm. On the other hand the University of Salzburg feels – mistakenly – obliged to apply learning outcomes rather immediately by the university law amendment from 18 August 2009.

3.2.3 Conclusions from the survey

We find rather heterogeneous situations, no matter if we compare the situations in different countries *or* institutions. Even within one university the situation can vary to a high degree in individual sub-divisions like faculties, departments, or institutes (at least at Austrian universities as we know from personal experience). This multi-speed development is not at all a surprise but a standard in the context of cultural change. As a matter of fact the paradigm shift to learning outcomes *has* to be considered as cultural change.

The adoption of learning outcomes needs a non-traditional way of thinking in educational contexts. For scientists (and as a matter of fact, university teachers *are* scientists) content traditionally builds the centre of their world – particularly their individual subject matter. To move this out of the centre of planning processes and to replace it by *student's* learning outcomes might be experienced in the same way as mankind suffered the cosmological mortification when Copernicus destroyed the (illusion of the) heliocentric system. Many institutions, managers and employees seem to be overstrained with this challenge. They need support, because successfully writing learning outcomes requires – beyond a new way of thinking – also new competences and a lot of experiences.

From our survey in German speaking countries we learned that many people (and institutions) do not begin to deal with the new paradigm before they are (or feel to be) obliged to do so: if not by law then by accreditation agencies. It seems to be just a minority that starts the respective change process by their own initiative, motivated by the insight and/or promise of future benefits and advantages. According to our experiences this applies primarily to people with a pedagogical or psychological background who had the opportunity to gain theoretical knowledge about the relevant topics. Scientists from other fields rarely had this option and thus often have a more difficult path to a new way of thinking and correspondingly acting in educational contexts. No doubt, individual coincidences can also play a significant role in the necessary change process; e.g. to have read a specific book, to have met a persuasive person, or to be part of an innovative team.

Nevertheless: wherever individual initiatives – be they significant or rudimental – can be firmed up and supported by tools, devices, and consultancy it will be possible to improve speed, quality, and results of the necessary paradigm shift with the utmost probability.

4 Summary and outlook

The Analysis of relevant literature and our survey among German speaking universities shows that the shift to learning outcomes is one of the most often discussed topic in the EHEA, but the practical realisation just has begun. Only two countries, Ireland and the United Kingdom, "have well established systems that have pioneered the higher education use of learning outcomes. In addition (…) Belgium, Croatia, Denmark, Estonia, Hungary, Italy, Moldova, Portugal, Romania, Spain, Sweden and Switzerland are making rapid progress towards a more comprehensive implementation of learning outcomes" (Adam, 2008, p.9).

That means that the EU member states Austria, Bulgaria, Czech Republic, Germany, Greece, Finland, France, Lithuania, Latvia, Luxembourg, Malta, the Netherlands, Poland, Slovakia, and Slovenia as well as the non EU member state Turkey belong to the "developing countries". Regarding the German speaking countries our survey points into the same direction: Austria, Germany – and even Switzerland – are no frontrunners, but the movement has started.

Those universities which are conscious of (future) competition already have begun to make efforts to apply the new learner centred paradigm of learning outcomes instead of the traditional teacher centred pattern of learning objectives or – even worse – of content as fundament for didactic design on all levels. But, as we also can read in the results of our survey, many of these pioneering universities lack the specific know how and supporting tools to tackle this matter in a professional way.

A significant number of universities have just begun the process while a third group is still waiting for the starting shot. Particularly the last mentioned institutions are the target group for *a learning outcomes-oriented support strategy* to be developed within the next two years and executed until completion of the paradigm shift in the EHEA.

The central tools will be blueprints of guidelines for writing learning outcomes on the one hand and a collection of best practice examples of learning outcomes (ILO repository) on module level on the other hand. Both will be based on exploitation and refining / adopting of available products which will be made easily accessible for interested institutions and individuals mainly via VIRQUAL website (respectively other adequate tools after the end of the project period), personal contact and further means.

4.1 Blueprint of guidelines for writing learning outcomes

Change processes are naturally susceptible to mistakes and failure. To be able to minimise mistakes and to optimise success it will be crucial to have simple tools for fulfilling the respective tasks. To meet this need VIRQUAL will go on

- to elaborate blueprints of guidelines in English for writing learning outcomes
- to translate and adopt them for European languages and countries
- to disseminate them in adequate ways among the respective target groups.

4.2 Repository for best practice examples of learning outcomes

A repository of intended learning outcomes will be easily manageable in the beginning of its development when the challenge is to optimise the formulations, to find out which cultural adaptations have to be done for different countries or institutions and to translate elaborated learning outcomes into other languages (at least English).

But if full coverage of all study programs in the European higher education area is required – and in a far future potentially achieved – we will have to handle estimated between 10.000 and 20.000 learning outcomes on module level. On course level the number would be four to six time higher. Such quantities are not manageable without a strong topical structure of high usability and ultimately with a coding system ready for machinable data processing.

4.3 A coding system for learning outcomes

The competences of a medical doctor will be the same in Paris, Marseille, Espoo, and Athens; at least to a very high degree. Basic skills in mathematics will be completely the same as well in the cities named above as in such different programmes as physics, psychology and economy. What usually makes the difference are the way these competences are described and the learning situations planned for developing them.

Therefore it is planned to elaborate a coding system for – professionally written – learning outcomes on a European (or international) level which assigns a specific code (e.g. analogue to IP addresses) to each specific competence:

- Knowing the multiplication table (1 to 10): 001.001.001.001
- Understanding the mechanism of multiplication: 001.002.039.014
- Being able to write a scientific paper: 002.037.004.127
- Being able to do the physical examination of an average patient: 037.123.382.200

On the basis of such codes – if (didactical) logically constructed

- high quality curricula could be designed,
- the effort of curriculum design could be considerably reduced,
- and last but not least the recognition of learning outcomes could be automatised.

If a lot of universities and other educational institutions contribute to this project the core competences of academic education could be coded within a few years.

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