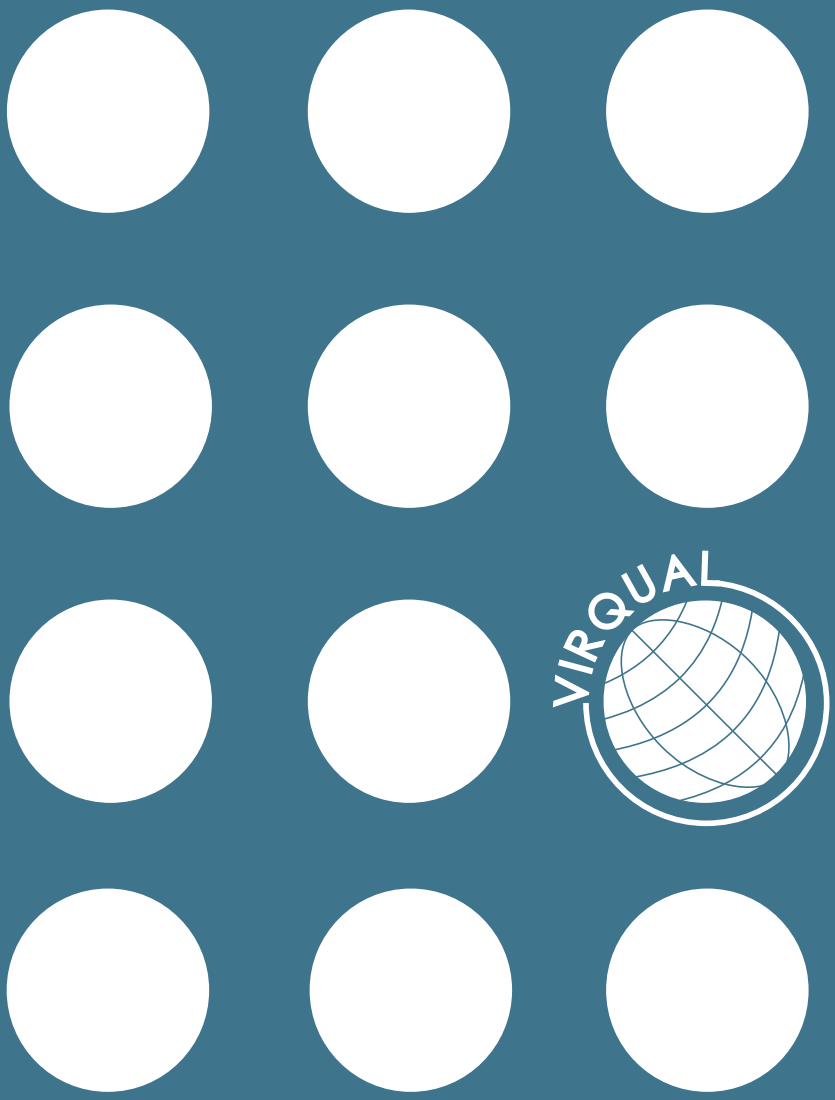


CONCEPTUAL MODEL FOR VIRTUAL MOBILITY AND EQF

VIRQUAL - CONCEPTUAL MODEL FOR VIRTUAL MOBILITY AND EQF

CONTENTS

A. Introduction

A.1. Summary

Europe has been investing in developing and implementing policies and tools to promote trans-European cooperation and mobility in many fields, including in Education. The Bologna Process is creating a European Higher Education Area where mobility, transparency and complementarities are key concepts. The recent formal adoption of the European Qualifications Framework was an additional and important step to achieve mobility in higher and continuing education. Joining e-learning and mobility together, we obtain a new concept Virtual Mobility, defined by elearningeuropa.info as "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". The expected benefits of Virtual Mobility in education and training are in terms of the quality of learning, of competences acquisition and of interaction with other cultures and working methods.

A.2. Objectives

The project proposes to help educational and training institutions to achieve Virtual Mobility and to guarantee EQF implementation using virtual teaching and training. The project aimed at proposing solutions to obstacles in institutions, helping students and learners in virtual environments, suggesting to teachers and course designers how to improve virtual mobility while proposing concrete tools. It was through the promotion of cooperation and joint work among partner organizations, the collaboration with related EU funded projects, the dialogue with organizations and associations and the feedback from interested stakeholders that the project progressed during the three years. There was also a significant effort to address other educational events to help the dissemination of the project results.

More specifically, the objectives of VIRQUAL are:

- To define, to exemplify and to promote discussion about using virtual learning as a scenario to foster national and international collaboration of Higher Education (HE) or Continuing Education organizations to achieve virtual mobility (VM).
- To critically assess and exchange results, ideas and innovation about European, national and local policies and initiatives in the area of VM, aiming at identifying possible obstacles and propose facilitators.

- To cooperate in the elaboration and implementation of concrete VM scenarios, by establishing relationships among the VIRQUAL network institutions and by providing solutions and specific tools for the different processes and for the various types of stakeholders (students, teachers and institutions) involved in the process.

- To elaborate, to implement, to make available and to disseminate tools to analyse, to support and to manage at Institutional level the VM in Europe while trying to implement the EQF requirements in terms of competences acquisition.

It is expected that through the results of this project network, other European HE and CE institutions and companies will find guidance, case studies and tools to integrate VM in their practices, contributing to the construction of a realistic virtual European Learning Space.

A.3. Context

To improve VM within the European area there is a need to develop a number of EU reference tools to help institutions, employers and learners. The VIRQUAL project proposes a number of recommendations and a set of principles for application in the fields of learning outcomes, quality assurance in HE and in CE, quality of assessment and the recognition of qualifications in European terms.

The consortium intended to provide a working frame for VM that contributed to HE institutions and to CE providers that offer virtual courses. The goal is to implement VM in the framework of the Bologna process[1] and of the Copenhagen process[2]. The first has created the European Higher Education Area (EHEA)[3] and the European Credit Transfer and Accumulation System (ECTS)[4] to allow mobility of academics and students. The second process has created the European Credit for Vocational Education and Training (ECVET)[5] for the improvement of mobility among the Vocational and Education Training (VET) learners and institutions. The European Commission has created the European Qualification Framework for lifelong learning (EQF)[6] to create synergies between the higher education (HE) and vocational and educational training (VET) systems.

The two areas, HE and VET, use systems to facilitate mobility that are similar but are used in different contexts according to the type of learning. ECTS comprises levels 5 to 8 of the EQF

[1] See http://ec.europa.eu/education/higher-education/doc1290_en.htm
[2] See http://ec.europa.eu/education/lifelong-learning-policy/doc60_en.htm
[3] See http://www.ehea.info/
[4] See http://ec.europa.eu/education/lifelong-learning-policy/doc48_en.htm
[5] See http://www.ecvet.net/c.php/ecvet/index.rsys
[6] See http://ec.europa.eu/education/lifelong-learning-policy/doc44_en.htm

while ECVET has been developed mostly for levels 3 to 6 of the EQF. ECTS evaluates credits based on the workload of the learner while ECVET distributes points according to the relevance of the learning outcomes (LO) of the learning course. The VIRQUAL model addresses both systems, HE and VET, independently of the type of learning. Other tools were analysed to facilitate mobility like the Diploma Supplement[7] and the CV Europass[8] and the model adopted some of the characteristics of these existing mechanisms.

Thus, the introduction of EQF for lifelong learning has established the general reference to understand and recognize competences across Europe. EU countries have adopted EQF that is translated into the National Qualification Frameworks (NQF)[9]. This conceptual framework is best defined by the expression from the Ministries communiqué on the Bologna meeting, in Leuven and Louvain-la-Neuve, Belgium in 2009:

> "Faced with the challenge of an ageing population Europe can only succeed in this endeavour if it maximizes the talents and capacities of all its citizens and fully engages in lifelong learning as well as in widening participation in higher education. European higher education also faces the major challenge and the ensuing opportunities of globalization and accelerated technological developments with new providers, new learners and new types of learning. Student-centered learning and mobility will help students develop the competences they need in a changing labour market and will empower them to become active and responsible citizens."

In accordance with this statement it should be possible for any student or professional to be able to enroll in any given course offered in a European program without having to displace physically. Many institutions, organizations and people may consider VM as a much valuable tool to improve students' accessibility to the HE and VET at the European scale. VM favours more varied modes of study, enlarges choice while looking for better courses and promotes access with more learning possibilities and lower cost modules. It also increases access while enlarging the offer of courses available and increasing quality due to competition among providers.

[7] See http://ec.europa.eu/education/lifelong-learning-policy/doc1239_en.htm
[8] See http://europass.cedefop.europa.eu/
[9] See http://www.ehea.info/article-details.aspx?ArticleId=69

A.4. Generic Framework

As a solution for different stakeholders involved in the process of VM a generic tool has been developed. It handles the following situations:

- To allow a European Union (EU) student (HE degree program) or learner (CE professional development) to validate the competences acquired in virtual courses taken in a different country, within the system of a third country.
- To check what a learner has acquired in a virtual course in another country.
- To accredit (validate) a course by an educational institution or by an organization.
- To permit that a teacher prepares its virtual course in accordance with a model with European dimension.
- To support a HE institution to prepare a virtual course to a European or global audience.

Some conditions of the VIRQUAL model are the following:

1. In order to check what has been acquired on a virtual course, the Learning Outcomes (LO) of the course should be defined and made available.
2. In order to ensure comparability among countries, the LO should be related to the European Qualification Framework (EQF) of levels 5 to 8.
3. Once the LO are defined according to the EQF, they can be transferred to any other EU country if the assessment methods are in accordance with the VIRQUAL model.
4. Transfer of the competences, provided by the LO of the course, can be made at the academic level, through a HE or VET, organization or at the professional, through a company. In both scenarios the VIRQUAL model is used as reference.

A.5. Example

- An engineer in Italy wants to learn about project management. He/she searches for options in other EU countries. In order that she/he can find the information required, the institutions should have previously used the ECTS Guide (European Credit Transfer

System) [10] or ECVET Guide (European Credit system for Vocation and Education Training)[11] as well as the teachers should have defined the LO for all courses. The VIRQUAL model is a tool helping the institution to ensure all courses comply with ECTS and ECVET and helping the teachers to define the LO of their courses. In the VIRQUAL database, the VIRQUAL model gives also the opportunity to the engineer-student to enter one of LO and search for courses with comparable LO.

- The engineer in Italy finally chooses a virtual course in France. She/he has checked that the course provides LO with competences of level 7. He/she also wants to check if the LO are properly assessed in that course. In e-learning, the LOs can be assessed in many different ways. The VIRQUAL model also helps the teachers to choose adequate assessment methods when the course is being designed.

- With the certificate of completion of the virtual course, the engineer wants to apply for a job in Finland that requires the competences described in that course. The employer in Finland verifies, using VIRQUAL model as a reference, if the course attended assured the competences required. If there is compliance the company should consider the competences acquired. A similar situation may occur with a HE or VET institution that intends to validate the LO acquired by a learner.

A.6. VIRQUAL model

Several projects have been addressing VM like MOVINTER[12], NET-ACTIVE[13], Active Asia[14] and Move-It[15]. These projects present solutions and guidelines to implement VM from different perspectives like practical, cultural, linguistic and scientific. The model developed within the VIRQUAL project proposes innovative applications like:

1. **Procedural aspects for implementing VM,** based on ECTS and ECVET procedures.

2. **Recognition of competences in the context of the EQF** or in other words the analysis of the possibility of linking the qualifications acquired in the virtual course to the EQF competences.

[10] See *ec.europa.eu/education/lifelong-learning-policy/doc/**ects/guide**_en.pdf*
[11] See http://www.ecvet.net/c.php/ecvet/index.rsys
[12] See http://www.movinter.eu/
[13] See http://www.net-active.info/
[14] See http://62.204.192.148/activeasia/
[15] See http://move-it.europace.org/

3. **Quality of the description of the LOs** using the repository and structure of the VIRQUAL model.

4. **Quality of the assessment of competences acquired in virtual environments** according to the table of the VIRQUAL model that relates EQF LOs and the possible types of assessment for virtual courses.

In terms of **procedures** concerning the institutional, organizational and individual perspectives, the VIRQUAL model proposes guidelines. These guidelines address issues like a course catalogue, list of learning outcomes from several courses, structure to wrote learning outcomes, map of EQF implementation in thirty one European countries, a relationship between EQF competences and types of assessment for virtual learning. This allows a common framework to compare between programs and courses from different institutions, facilitates the information search, establishes common understanding and smoothes the recognition of the learning achieved.

In order to **link LOs to the EQF**, the VIRQUAL model proposes a description of the implementation of the EQF in the twenty seven EU countries plus three other European countries. These reports also include, for the same countries, an evaluation of the acceptance of VM in legal or in academic terms. It is an attempt to facilitate the understanding of the contours of VM and of the EQF in each country. The report tried to compile in one document the information about different legal and academic conditions in the different countries. That will allow the evaluation of the possibilities of the virtual learning to be used to acquire and recognize competences and qualifications acquired. It reflects the situation at one specific moment in time with the last update in June of 2011.

In order to ensure a better quality of the description of LOs, the VIRQUAL model offers a digital template to structure each course in a standardized format that is related to the EQF. It is expected that the accumulation of virtual courses descriptions will represent a database of LOs available for a student, institution or company that is searching for a specific LO around Europe. To check if the assessment methods are adequate for the competences envisaged in the learning, the VIRQUAL model proposes modes of assessment that are considered adequate for the different types of competences identified in the different levels of EQF. This is presented in a matrix with the LOs of the four levels of the EQF competences related with the possible types of assessment used in the virtual environment. For adaptation to NQF or to sector qualification frameworks the same type of matrix can be developed and used.

A.7. Practical Guides

The findings and results of the VIRQUAL project are made available also in the form of practical manuals. The three manuals were prepared for different types of users: institutions/companies, students/learners and teachers. Since these are simple and specific guides each have different steps to follow.

Guide for HE/CE Institutions and Companies

This manual helps the institutions and companies in developing virtual mobility in four ways:

1. Using the guidelines globally accepted to define the proper documents and organize the information. To do this procedural aspects for implementing Virtual Mobility are proposed.

2. Checking the implementation of the EQF in the country where the student/learner will acquire its competences or has already obtained competences. The verification can be done consulting the survey available on the project site: virqual.up.pt.

3. In order to organize the LOs of the courses or modules, the institution can use the template of VIRQUAL. The template is available at the project site: virqual.up.pt.

4. Giving suggestions about proper assessment methods for virtual learning and training. A matrix is proposed for this purpose and is available in this report.

Guide for Student/Learner willing to undertake VM

This manual helps the student/learner in four ways:

1. Using adequate forms and documents to verify the learning outcomes and competences of the course. The structure of the LO repository is available as reference in the project site: virqual.up.pt.

2. Verify if virtual course or module provides LO or competences described in EQF. The survey describing the implementation of EQF can be consulted in the project site: virqual.up.pt.

3. Search for a virtual course or module that complies with chosen LO. The control can be done using the VIRQUAL model repository at the project site: virqual.up.pt.

4. Checking if assessment types proposed for a specific course are adequate according to the VIRQUAL proposal, for the intended competences. A matrix is proposed for this purpose and is available in this report.

Guide for teachers of virtual courses

This manual helps the teacher in three ways:

1. Describing the LOs provided by the virtual course or module that is being designed in relation to the EQF. To do this a digital template is proposed that is available at the project site: virqual.up.pt.

2. Checking the relevance of the chosen assessment type for each LO of the virtual course. A matrix is proposed for this purpose and is available at the project site: virqual.up.pt.

3. In order to advise a student/learner to take this or that virtual course with the objective to validate the competence acquired. The verification of relevance to EQF and to proper assessment types can be done at the project site: virqual.up.pt.

B. Methodology

The methods used in the beginning of the project are described in detail in the final reports available in the project site as outputs of the Special Interest Groups (SIG) 1 to 4. Summaries of the research questions, of the research done and of the results can be found in the newsletters 1 to 3. The relevant aspects of the work done by the SIG are presented in short terms and were reported in the project interim report of June 2010.

B.1. SIG 1: Virtual Mobility, ECTS and E-learning

The first phase originated four research questions:

a. Has the implementation of the EHEA with the European-wide adoption of the ECTS credit system and competence-based curricula effectively helped to foster student mobility so far?

b. What are the most important differences of Virtual Mobility in regard to Physical Mobility?

c. What are the most important barriers to virtual mobility (specific requirements, languages, percentage of face-to-face mandatory sessions in the courses,…)?

d. Are European Higher Education Institutions applying homogenous criteria when calculating the student workload in online and blended learning courses?

B.2. SIG2: Fundamental Research

The project team gathered four different case studies; an evaluation repository of cross-institutional Virtual Campus initiatives across Europe, an operational model of Virtual Mobility in Higher Education and two online respectively blended learning courses were analyzed. To gain a better overview a table was created to display the essential factors of each case study by which it is now possible to think about how to approach the topic in a more beneficial way and where to continue the research. The SWOT analysis performed in this SIG allowed following up information about key factors, weaknesses and opportunities of the case studies in an efficient way.

B.3. SIG3: E-learning and evaluation of Learning Outcomes of EQF

Learning outcomes can be seen as the hard currency of educational mobility and recognition, as soon as they are explicitly defined and professionally described.

Learning outcomes in combination with adequate assessment procedures can be assumed as one of the main promoters for mobility with respect to both, students and institutions. But the shift to learning outcomes in the EU currently means a multispeed development within different countries and institutions. To support the majority of institutions which are in or before the first phase of the change process a twofold strategy is proposed:

a. provision of guidelines and support for writing learning outcomes

b. web-based repository of best practice examples for learning outcomes

B.4. SIG4: E-learning Contributions to EQF

During the first year of work, it was done research on policies and practices in what concern e-learning and virtual campus in Europe, EQF and NQF current state of implementation and Virtual Mobility guidelines. The implementation of the European

Qualification Framework is a great opportunity to discuss the role of ICT in learning.

HE and CE have an important role to play, based on learning innovation, learning at the workplace and university learning (but we need to define it ourselves).

In order to improve the research, the following lines of work are proposed:

a. How can e-learning courses contribute to the acquisition of qualifications in different levels of the EQF?

b. Can it be acquired all types of qualifications through e-learning?

c. Which are the qualifications acquired by e-learning and the characteristics of these qualifications?

d. What are the reasons why some qualifications cannot be acquired by e-learning?

e. What are the best scenarios and strategies for e-learning that can be put in place at the level of EQF, Bologna and Lifelong learning?

f. Are the learning outcomes to be related to learning content (curricula) or to activities to be performed by learners in the workplace or both?

g. How can the new e-learning strategies using web 2.0 and social networks be used within the EQF and NQF plans for implementation?

h. How can HE and CE institutions certify Informal online learning (via the access to open educational resources or any other online open tools)?

The second phase of the project readapted the structure of the partnership to accommodate the results of the first phase. The four groups were transformed into three task forces:

- Task 1: Virtual mobility, ECTS, ECVET and mobility
- Task 2: E-learning and EQF
- Task 3: E-learning and evaluation of learning outcomes

Tasks 1 and 2 produced guides for potential users of virtual mobility, categorized in terms of three profiles as described before. These guides were designed to be simple and practical. A first version was produced by the end of the first semester of 2011. This first version was tested with members of the network and in a workshop in the EDEN annual conference, Dublin, Ireland. Each partner tested the guides with one student, one institutional stakeholder and one course designer or teacher. Testing with the members of the network and with the workshop participants produced several recommendations that were considered for the production of a second version. The second version was tested with different stakeholders in

the workshops of the S-ICT conference, Vienna, Austria, and of the EUCEN conference, Genoa, Italy. This second round of testing influenced the production of the final three guides.

Task 3 produced a learning outcome template using a Moodle platform to create a searchable database and to provide a fixed structure intended for the course designer or the teacher that uses the template. Cases stored in template constitute a repository that allows guidance and information for future users. The template complies with European guidelines and international codes for classification of courses. It can be used as reference or as a place to register the virtual course or module. Each project partner has uploaded at least one course in the template.

C. Results

The results of the research are presented in four sections, corresponding to the work of three Task Forces.

C.1. Implementation of VM in the Framework of the European Higher Education Area and European reference tools for VM

To improve Virtual Mobility within the European area there is a need to develop a number of EU reference tools to help institutions, students and teachers. The present section intends to provide a general introduction to the topic of VM in Europe, helping HE and CE institutions who offer virtual courses to implement VM in the framework of the European Higher Education Area. The VIRQUAL research team also proposes a number of recommendations and a set of common principles for application in the fields of learning outcomes, quality assurance in HE and CE, quality of mobility, lifelong guidance and the recognition of qualifications abroad.

EQF

The EQF[16] aims to relate different countries' national qualifications systems to a common European reference framework. Individuals and employers will be able to use the EQF to better understand and compare the qualifications levels of different countries and different education and training systems. The core of the EQF is composed by eight reference levels describing what a learner knows, understands and is able to do – learning outcomes (LO). LO are also defined as competences if these were acquired by the student/learner.

[16] See http://ec.europa.eu/education/lifelong-learning-policy/doc44_en.htm

Levels of qualifications in accordance with EQF will be placed at one of the central reference levels, ranging from basic (Level 1) to advanced (Level 8). This will enable a much easier comparison between national qualifications and should also mean that people do not have to repeat their learning if they move to another country. The EQF applies to all types of education, training and qualifications, from school education to academic, professional and vocational. EQF is used as translator of the national qualification in one country to the national qualification in a second country.

This approach shifts the focus from the traditional system which emphasises 'learning inputs', such as the length of a learning experience, or type of institution. It also encourages lifelong learning by promoting the validation of non-formal and informal learning since these are based on competences that an individual possesses at the time when it requires validation.

Virtual Mobility (VM)

An open European area for higher learning carries a wealth of positive perspectives, of course respecting our diversities, but requires on the other hand continuous efforts to remove barriers and to develop a framework for teaching and learning, which would enhance mobility. Other tools have been developed like the Europass Diploma Supplement, Europass CV and Europass Mobility. The introduction of the EQF tried to address the challenge of making qualifications more acceptable in the different EU countries. It is divided in eight levels that comprise the whole spectrum of qualifications. Each professional sector may develop specific frameworks for the respective levels in a European context. One of the examples is the Engineering with the EUR-ACE project and the accreditation agency ENAEE.

Virtual mobility (VM) in this project is defined by EADTU's Task Force on Virtual Mobility Position Paper:

"Virtual mobility [VM] does not require a physical stay abroad nor face-to-face activities and may not have restrictions in length of time spent studying. Students stay at their home university or even at home or at their workplace. VM offers access to courses and study schemes in a foreign country and allows for communication activities with teachers and fellow students abroad via the new information and communication technologies. For the student it is merely an educational experience, although through the interaction with others intercultural competences can be acquired. For the learner it is time and cost effective."

The design of VM mobility is flexible and can be adapted to various circumstances. It offers mobility possibilities for students restricted from physical displacement due to employment, family or disability. But it also can be used to prepare for, accompany and complete a

physical mobility stay abroad or it can even be used to maintain contact with the home university throughout a physical mobility stay abroad. Moreover, VM can provide unlimited access to courses in all phases of lifelong learning and training, and also can be used to enrich lifelong learning and training at any phase of a student's career.

In this sense, a real added value of VM mobility can only be accomplished with the recognition of courses taken abroad. To achieve that goal there is a need to establish a common European set of principles that allow the courses transferability between different countries.

Common principles:

To organize VM providers of HE and of CE should guarantee a number of prerequisites namely:

- The identification of a clear set of knowledge, skills and competencies that should be accepted in HE and in CE institutions;
- The identification of courses learning outcomes;
- The quality assurance of validation procedures as a key for creation of mutual trust and credibility;
- The transparency of the validation processes;
- The use of successful assessment methodologies that combine several techniques (i. e. tests, portfolios, interviews, etc.);
- The development of methodologies which are learning-outcomes-based;
- The clear description of the competences acquired according to the EQF and related NQF.

The systems to be used for procedural aspects can be the European Credit Transfer System (ECTS)[17] or the European Credit system for Vocation and Education Training (ECVET)[18]. The first is adequate for the Higher Education area and the second in the Vocational and Educational area. ECTS was created in 1995 and the ECVET in 2009. The main difference between the two is that ECTS uses credits and the ECVET adopted points. The credits of ECTS are based on the work done by the learner in each module. The points of ECVET are

[17] See http://ec.europa.eu/education/lifelong-learning-policy/doc/ects/guide_en.pdf
[18] See http://ec.europa.eu/education/lifelong-learning-policy/doc/ecvet/faq_en.pdf

distributed as a function of the learning outcomes of the module. Both systems adopt 60 credits or points in one year to each full time BA-MA learner. The other mechanisms are similar. Both systems provide a common understanding on possible organizational, pedagogical and technical approaches to the implementation of Virtual Mobility within the European Qualification Framework.

C.2. Elearning and EQF - Cross analysis of data from thirty one countries reports

The current section resulted from the analysis of the information provided by reports from thirty one countries: 27 European Union countries, Switzerland, Iceland, Turkey and Norway. These reports were made by all partners and were based on public documentation and research. The tables presented in this annex are a summary of the information available. This information can be obtained from the project website.

The relevant issues that this research tried to answer concern the following topics:

- How to integrate the requirements of VM and the description of learning outcomes and assessment?
- If a learner/student from one country studies in a second country and intends to be qualified to work or study in a third country what are the important questions?
- Within the European Qualification Framework which are the competences that can be transferred from one country to another and how can this be achieved?
- Has the country a National Qualification Framework related with the European Qualification Framework?
- Are sector competences adopted in a given country?
- Is virtual learning/training included in the professional or academic legal framework?

The key information obtained in the country reports was summarized in tables for each country that allows access to information on EQF, on recognition of competences in each country and on virtual learning legislation and framework. It is intended to be a useful tool that allows a student/learner in Estonia to attend an online course in Hungary with competences to be recognized in Spain. The topics of the summary tables for each country are:

a. Comparability of qualifications levels

b. Use of learning outcomes in Higher Education (HE) and in Continuing Education (CE)

c. National legislation on European Qualification Framework (EQF) in the levels 5 to 8

d. Level of implementation of National Qualification Framework (NQF)

e. Recognition of informal learning

f. Information about virtual learning/training implementation

The country surveys and summary of the thirty one surveys can be found at the VIRQUAL site: virqual.up.pt.

C.3. Intended Learning Outcomes Repository

Learning outcomes (LO) of high quality can contribute to academic mobility and represent the state-of-the-art course design. LOs can be a means for transparency of educational offers on local, national or international levels. That transparency depends on the quality of didactic reflection as well as on the standardization of terminology for writing LOs. On the other hand it is not necessary to invent the wheel again in each country, town, or university. The competences of a medical doctor, for instance, will be the same in Zurich, Rome, Espoo or Athens. Basic skills in mathematics will be completely the same in all these places as well as in different programmes like physics, psychology, or economy. What actually makes the difference is the way to describe these competences and, of course, the individual design of correspondent learning situations. Most certainly the corresponding learning outcomes are universal in the different countries.

Teachers and institutions could save a lot of time and simultaneously increase the quality of their educational offers, if they were able to utilize prefabricated, standardised, and quality-tested LOs for designing and describing their curricula on all levels. Individual teachers and institutions in Europe (and certainly also all over the world) have already produced a number of well defined intended LOs (ILOs) for single courses or modules, and elaborated LOs architectures for complete programs. Consequently there is a pool of well written LOs scattered over some thousand European HE and CE institutions. But, even if those LOs are published somewhere in the internet or in internal papers, they are not accessible and usable in an efficient way. For an individual teacher it would cost too much time and effort to find the specific LOs he or she needs for designing a particular course or program.

Questions

For encouraging VM of European students/learners and improving the quality of learning offers in the European Higher Education Area in general there are four questions.

(1) How can we contribute to higher transparency of descriptions of learning offers?

(2) How can the insufficient quality of the majority of learning outcomes be improved?

(3) Is it possible to establish a shared language for writing learning outcomes?

(4) How will a systematic architecture of learning outcomes look like?

Method

The project website virqual.up.pt has as one of the main outputs of VIRQUAL a repository that was established for collecting and developing LOs of all subjects and HE and CE institutions. The core of this website is a LOs repository on the technical support of a Moodle database. The platform was installed by end of August 2010 and is accessible since mid of October 2010.

The function of this repository is to open the opportunity for European HE and CE institutions to publish ILOs of their study programmes (on module level), to compare them with those of other institutions and thus to start a process of shared quality development of LO descriptions and architectures in a virtual environment. The ILO repository allows to upload learning outcomes of modules but also to furnish them with specific metadata for connecting them with disciplines. The proposed descriptors in each course or module are levels and competences (knowledge, skills and attitudes) defined by the EQF, domains of learning and stages of proficiency. An example is given in Figure 1.

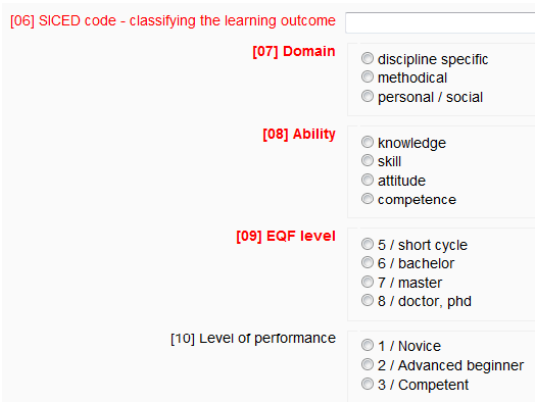


Figure 1: Screenshot of central fields of ILO repository

This classification system tries to facilitate finding a single ILO in a pool of some ten thousands. Table 1 presents the structure of the ILO repository.

Fields	Explanations
Part A: Module data	Short identification of the module the following ILO (intended learning outcome) is part of.
[01] Name of the module	[01] Name of module as used in corresponding curriculum
[02] ISCED code of the module	[02] The ISCED code (see "Erasmus Subject Code - ISCED classification") classifies the subject of learning units (typically of complete programmes). Mostly the ISCED codes of a specific *module* and the superordinate *programme* will be the same. But in a significant number of cases there will be a difference, e.g. ▪ soft skills modules (09 = Personal Skills) in Engineering programmes (5 = Engineering, Manufacturing and Construction) ▪ mathematics modules (461 = Mathematics) in Business programmes (340 = Business and Administration).
Part B: Details of specific learning outcome	For comparison, development and individual use of specific ILOs it is necessary to be able to find and unambiguously identify them. Additional information will be asked referring to assessment methods.
[03] Fulltext [English]	[03] Fulltext [English]: Wording of the specific ILO as used in corresponding curriculum: in English – translation (from original language) or original text
[04] Fulltext [in original language - if not English]	[04] Fulltext [in original language - if not English]: Leave blank if original language is English
[05] Fulltext [further language/s]	[05] Fulltext [further language/s]: Here is space for translations into any other languages
[06] ISCED code - classifying the learning outcome	[06] The ISCED code (see "Erasmus Subject Code - ISCED classification") classifies the subject of learning units (typically of complete programmes). Mostly the ISCED codes of a specific *ILO* and the superordinate *module* will be the same. But in a number of cases there will be a difference (similar as with modules and programmes), e.g. ▪ mathematical ILOs (461 = Mathematics) in Engineering modules (5 = Engineering, Manufacturing and Construction) ▪ economic ILOS (314 = Economics) in Civil engineering modules (582 = Building and civil engineering)
[07] Domain	[07] Domain: For the purpose of clear identification of ILOs we apply a trinomial classification of the domain of learning outcomes: ▪ discipline specific: relevant only in the context of one specific subject – like medical, chemical or psychological knowledge / competences ▪ methodical: knowledge or competence overarching some or many disciplines like research methodology, documentation skills or statistics ▪ personal / social: all knowledge, skills, attitudes and competences necessary to enable and improve living and working in a social context. (The classification of the domain was adopted from: Tippelt, R. / Mandl, H. / Straka, G. (2003): Entwicklung und Erfassung von Kompetenz in der Wissensgesellschaft – Bildungs- und wissenstheoretische Perspektiven. In: Gogolin, I. / Tippelt, R. (Hrsg.): Innovation durch Bildung. Beiträge zum 18. Kongress der Deutschen Gesellschaft für Erziehungswissenschaft. Opladen, S. 349-369.)
[08] Ability	[08] Ability: For the purpose of clear identification of ILOs we use the EQF classification of learning outcomes – supplemented by attitudes (which still lack in

	the EQF model): ▪ Knowledge: the outcome of the assimilation of information through learning. Knowledge is the body of facts, principles, theories and practices that is related to a field of work or study. In the context of the European Qualifications Framework, knowledge is described as theoretical and/or factual ▪ Skill: the ability to apply knowledge and use know-how to complete tasks and solve problems. In the context of the European Qualifications Framework, skills are described as cognitive (involving the use of logical, intuitive and creative thinking) or practical (involving manual dexterity and the use of methods, materials, tools and instruments) ▪ Attitude: "a relatively enduring organisation of beliefs, feelings, and behavioural tendencies towards socially significant objects, groups, events or symbols" (Hogg & Vaughan 2005, p. 150); "a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor" (Eagly & Chaiken, 1993, p. 1) ▪ Competence: the proven ability to use knowledge, skills and personal, social and/or methodological abilities, in work or study situations and in professional and personal development. In the context of the European Qualifications Framework, competence is described in terms of responsibility and autonomy. Sources: For knowledge, skill and competence: European Commission: The European Qualifications Framework for Lifelong Learning (EQF), Luxembourg: Office for Official Publications of the European Communities, 2008, ISBN 978-92-79-08474-4. For attitude: Hogg, Michael A. / Vaughan, Graham M. (2005; 4th edition). Social psychology. Harlow: Pearson. Eagly, A.H. / Chaiken, S. (1993). The Psychology of Attitudes, Fort Worth, TX: Harcourt Brace Jovanovich.
[09] EQF level	[09] EQF level: Relevant in our context are only the four academic levels of the EQF: 5 – short cycle 6 – bachelor 7 – master 8 – doctor, phd
[10] Level of performance	[10] Level of performance: With reference to competences the intended level of performance might be variable: comparative simple competences (e.g.: to develop software solving a simple, well defined problem) can be fully accomplished in a bachelor programme while complex competences (e.g.: to be able to construct a highway bridge) will be developed not further than advanced level in a master programme. 1 – Novices are characterised by "rigid adherence to taught rules or plans, little situational perception, no discretionary judgement" 2 – Advanced beginners are able to use "guidelines for action based on attributes or aspects (aspects are global characteristics of situations recognisable only after some prior experience)", their "situational perception is still limited", while "all attributes and aspects are treated separately and given equal importance" 3 – Competent persons are ready for "coping with crowdedness" and "conscious, deliberate planning", they are able to "see actions at least partially in terms of longer-term goals" and to apply "standardised and routinised procedures". Sources: Dreyfus, Stuart E. & Dreyfus, Hubert L. (1980), A Five-Stage Model of the Mental Activities Involved in Directed Skill Acquisition.

[11] Assessment methods applicable	[11] Assessment methods applicable: Try to classify the methods you use for assessment of this specific learning outcome according to the following list provided by VIRQUAL. 1 – Adaptive Test 2 – Chat room 3 – CLOZE Question Type 4 – Collaborative assignments 5 – Concept Map 6 – Discussion Group 7 – Drag-And-Drop Question Type 8 – Drop-Down question type 9 – E-Portfolio 10 – Essay Style Question Type 11 – Game-Based Learning 12 – Gap Fill Question Type 13 – Group Assessment 14 – Hotspot Question Type 15 – Mathematical Question Type 16 – Multiple Choice Question Type 17 – Numeric Response Question Type 18 – Peer Assessment 19 – Role-play 20 – Sequence Response Question Type 21 – Short Answer Question Type 22 – Simulation 23 – Text Matching Question Type 24 – True/false question type 25 – Website or publication 26 – Wiki
Part C: Module details	The following information provides details of the module. It has to be entered only once per module – preferably with the first of its learning outcomes.
[12] Percentage of distance learning [0 - 100% of workload]	[12] Percentage of distance learning [0 - 100% of workload]: to which degree distance learning (e-leaning) is scheduled - in % of total workload of students.
[13] Percentage of distance assessment [0 - 100% of total assessment]	[13] Percentage of distance assessment [0 - 100% of total assessment]: to which degree distance assessment (e-assessment) is used - in % of total assessment
[14] Detailed description (rtf file)	[14] Detailed description (rtf file): The core information of the module collected by a template (https://www.learning-outcomes.org/mod/resource/view.php?id=15) with following fields: General Information / Module • Title in original language • Erasmus Subject code • ISCED code • Internal code • Web address • Institution: • Name | abbreviation • Erasmus ID code • Web address • Study Programme/s

	• using this module • Module Details • Teaching language/s • ECTS Credits • Total workload (in hours) • Contact hours • Pre-requisites • Module objective • Module content • Applicable Methods • % of distance learning • % distance assessment • Teaching methods • Assessment methods Learning Outcomes • #1: English / original language …. to …. • #x: English / original language
[15] URL (of module description)	[15] URL (of module description): If there is a module description available in the internet, please enter it here.
[16] Erasmus code – classifying the module	[16] Erasmus code – classifying the module (see "Erasmus Subject Code - ISCED classification ") classifies the subject of learning units (typically of complete programmes). Mostly the Erasmus codes of a specific module and the superordinate programme will be the same. But in a significant number of cases there will be a difference, e.g. • soft skills modules (16.0 = Personal Skills) in Engineering programmes (06.0 = Engineering, Technology) • mathematics modules (11.1 = Mathematics) in Business programmes (04.0 = Business Studies, Management Sciences).
[17] Number of module within programme	[17] Number of module within programme: If there is a fixed sequence of modules within a programme – what is the number of this specific module?
Part D: Programme identifier	The following information provides details of the Programme. It has to be entered only once per module – preferably with the first of its learning outcomes.
[18] Title / ISCED code / Erasmus code / URL of programme	[18] Title / ISCED code / Erasmus code / URL of programme: ILO is part of following study programme
[19] Qualification profile of programme	[19] Qualification profile of programme: Qualification profile of study programme above
[20] Title(s) / ISCED code(s) / Erasmus code(s) / URL(s) of further programme(s)	[20] Title(s) / ISCED code(s) / Erasmus code(s) / URL(s) of further programme(s): ILO is part of following further study programme/s
Part E: Information about authors	To be able to understand all entries an modifications / additions it will be valuable to know something about the authoring process.
[21] Date of entry, comments, e-mail address of author(s)	[21] Date of entry, comments, e-mail address of author(s): Who did what, why and when?

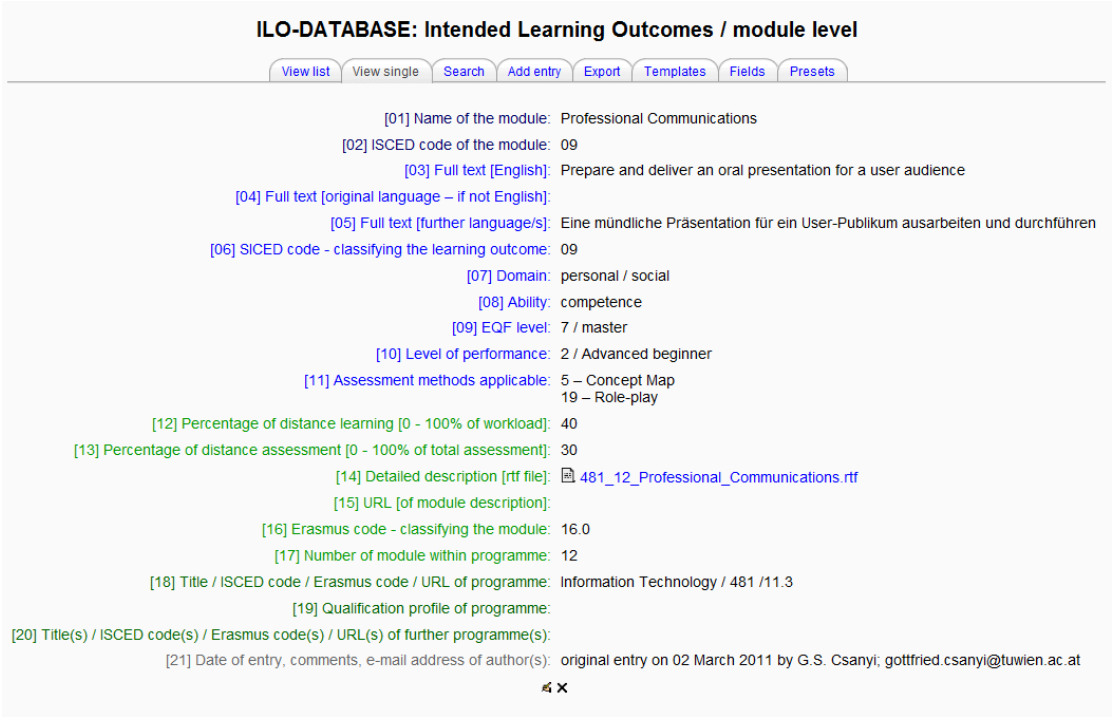
Table 1: Structure of the ILO repository

Expected Outcomes

If a significant number of HE and CE teachers and institutions will contribute to the ILO repository by entering their LOs and/or by editing those existing then there will be:

- a growing collection of written LOs,
- continuous improvement of formulations of ILO according to linguistic and didactic criteria,
- growing transparency of the universe of LOs of modules and study programmes, and
- a collection of useful sample formulations of LOs for curriculum planning and course design.

The following Figure 2 shows a sample entry of a specific learning outcome (Intended LO):



ILO-DATABASE: Intended Learning Outcomes / module level

View list | View single | Search | Add entry | Export | Templates | Fields | Presets

[01] Name of the module:	Professional Communications
[02] ISCED code of the module:	09
[03] Full text [English]:	Prepare and deliver an oral presentation for a user audience
[04] Full text [original language – if not English]:	
[05] Full text [further language/s]:	Eine mündliche Präsentation für ein User-Publikum ausarbeiten und durchführen
[06] SICED code - classifying the learning outcome:	09
[07] Domain:	personal / social
[08] Ability:	competence
[09] EQF level:	7 / master
[10] Level of performance:	2 / Advanced beginner
[11] Assessment methods applicable:	5 – Concept Map 19 – Role-play
[12] Percentage of distance learning [0 - 100% of workload]:	40
[13] Percentage of distance assessment [0 - 100% of total assessment]:	30
[14] Detailed description [rtf file]:	481_12_Professional_Communications.rtf
[15] URL [of module description]:	
[16] Erasmus code - classifying the module:	16.0
[17] Number of module within programme:	12
[18] Title / ISCED code / Erasmus code / URL of programme:	Information Technology / 481 /11.3
[19] Qualification profile of programme:	
[20] Title(s) / ISCED code(s) / Erasmus code(s) / URL(s) of further programme(s):	
[21] Date of entry, comments, e-mail address of author(s):	original entry on 02 March 2011 by G.S. Csanyi; gottfried.csanyi@tuwien.ac.at

Figure 2: Screenshot of sample entry

Potentials

Provided that the participation of HE and CE teachers and institutions will be sufficient there will be gathered valuable material for:

- building a homogenous and transparent European Higher Education Area,
- analysing the didactic dependencies between LOs on different levels,
- administrative simplification of physical and VM of European students/learners,
- a tool kit – consisting of LOs and related assessment methods for easier design of curricula, modules and courses.

C.4. EQF Competences and Assessment Methods

This section presents the competences defined in the EQF, the definition of types of assessment in a virtual environment and the choice of these types of assessment adequate for evaluation of the competence of EQF. There are three tables with the details of these systems. The matrix matching competences versus assessment types is not exhaustive or proof tested. This matrix is a suggestion subject to improvement and to correction.

		KNOWLEDGE	SKILLS	COMPETENCES
		In the context of EQF, knowledge is described as theoretical and/or factual.	In the context of EQF, skills are described as cognitive (involving the use of logical, intuitive and creative thinking) and practical (involving manual dexterity and the use of methods, materials, tools and instruments).	In the context of EQF, competence is described in terms of responsibility and autonomy.
LEVEL 1	The learning outcomes relevant to **Level 1** are	- basic general knowledge	- basic skills required to carry out simple tasks	- work or study under direct supervision in a structured context
LEVEL 2	The learning outcomes relevant to **Level 2** are	- basic factual knowledge of a field of work or study	- basic cognitive and practical skills required to use relevant information in order to carry out tasks and to solve routine problems using simple rules and tools	- work or study under supervision with some autonomy
LEVEL 3	The learning outcomes relevant to **Level 3** are	- knowledge of facts, principles, processes and general concepts, in a field of work or study	- a range of cognitive and practical skills required to accomplish tasks and solve problems by selecting and applying basic methods, tools, materials and information	- take responsibility for completion of tasks in work or study - adapt own behaviour to circumstances in solving problems
LEVEL 4	The learning outcomes relevant to **Level 4** are	- factual and theoretical knowledge in broad contexts within a field of work or study	- a range of cognitive and practical skills required to generate solutions to specific problems in a field of work or study	- exercise self-management within the guidelines of work or study contexts that are usually predictable, but are subject to change - supervise the routine work of others, taking some responsibility for the evaluation and improvement of work or study activities

LEVEL 5	The learning outcomes relevant to **Level 5** are	- comprehensive, specialised, factual and theoretical knowledge within a field of work or study and an awareness of the boundaries of that knowledge	- a comprehensive range of cognitive and practical skills required to develop creative solutions to abstract problems	- exercise management and supervision in contexts of work or study activities where there is unpredictable change - review and develop performance of self and others
LEVEL 6	The learning outcomes relevant to **Level 6** are	- advanced knowledge of a field of work or study, involving a critical understanding of theories and principles	- advanced skills, demonstrating mastery and innovation, required to solve complex and unpredictable problems in a specialised field of work or study	- manage complex technical or professional activities or projects, taking responsibility for decision making in unpredictable work or study contexts - take responsibility for managing professional development of individuals and groups
LEVEL 7	The learning outcomes relevant to **Level 7** are	- 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	- specialised problem-solving skills required in research and/or innovation in order to develop new knowledge and procedures and to integrate knowledge from different fields	- manage and transform work or study contexts that are complex, unpredictable and require new strategic approaches - take responsibility for contributing to professional knowledge and practice and/or for reviewing the strategic performance of teams
LEVEL 8	The learning outcomes relevant to **Level 8** are	knowledge at the most advanced frontier of a field of work or study and at the interface between field	- the most advanced and specialised skills and techniques, including synthesis and evaluation, required to solve critical problems in research and/or innovation and to extend and redefine existing knowledge or professional practice	- demonstrate substantial authority, innovation, autonomy, scholarly and professional integrity and sustained commitment to the development of new ideas or processes at the forefront of work or study contexts including research

Table 2: Competences of the EQF of levels 1 to 8

Assessment type	General Characteristics
Chat room	An online discussion where learners can communicate in real time by posting text/files to a common display page.
Discussion Forum	An online forum where users can communicate in by posting text/files to a display page.
E-mail	A method for exchanging digital messages, containing text and/or files to one or more recipients.
Computer Based Testing	Method of administering a test in which the responses are electronically recorded, assessed or both.
Paper Based Testing	Method of delivering test where the responses are recorded on paper and can be graded both manually or electronically.
Assignments	Set of authentic tasks that individuals or groups have to investigate and solve.
Game-Based Learning	A relatively new field of e-learning which uses computer gaming technology and techniques to provide learning and/or assessment.
Role-play	Students adopt a persona in a simulated activity.
Simulation	Students engage with interactive application to generate results and consequences.
Peer Assessment	Assessment of a student by a fellow students or students typically following the same programme of study and applying criteria and standards.

E-portfolio	A portfolio is a purposeful collection of student work in a digital format that exhibits the students's efforts, progress and achievements in one or more areas. The collection must include student participation in selecting contents, the criteria for selection, the criteria for judging merit and evidence of student self-reflection.
Website or Media publication	A website is a collection of related web pages, images, videos or other digital assets that are addressed relative to a common subject.
Wiki	A wiki is a website that allows the collaborative creation and editing of any number of interlinked web pages via a web browser, keeping track of changes by different editors.

Table 3: Definition of some assessment types

Assessment	Adaptable test	Chat room	CLOZE question	Collaborative assignments	Concept map	Discussion group	Drag and drop	Drop down	E-portfolio	Essay style	Game-Based	Gap-fill	Group assessment	Hotspot	Mathematical	Multiple choice	Numeric response	Peer assessment	Role-play	Sequence response	Short answer	Simulation	Text matching	True/false	Website or publication	Wiki
Level 5																										
(K) comprehensive, specialised, factual and theoretical knowledge within a field of work or study and an awareness of the boundaries of that knowledge	x		x				x	x		x		x		x	x	x					x		x	x	x	x
(S) a comprehensive range of cognitive and practical skills required to develop creative solutions to abstract problems					x					x	x		x				x		x	x		x			x	x
(C) exercise management and supervision in contexts of work or study activities where there is unpredictable change		x		x		x			x		x		x						x							
(C) review and develop performance of self and others		x		x		x			x				x					x								x	x
Level 6																										
(K) advanced knowledge of a field of work or study, involving a critical understanding of theories and principles	x		x		x	x	x	x		x		x		x	x	x	x			x	x		x	x	x	x
(S) advanced skills, demonstrating mastery and innovation, required to solve complex and unpredictable problems in a specialised field of work or study	x	x		x	x	x			x		x		x						x			x				
(C) manage complex technical or professional activities or projects, taking responsibility for decision making in unpredictable work or study contexts	x	x		x	x	x					x								x			x				
(C) take responsibility for managing professional development of individuals and groups				x	x	x					x		x					x	x			x				

Table 4: Matrix matching competences versus assessment (types levels 5 and 6)

Assessment	Adaptable test	Chat room	CLOZE question	Collaborative assignments	Concept map	Discussion group	Drag and drop	Drop down	E-portfolio	Essay style	Game-Based	Gap-fill	Group assessment	Hotspot	Mathematical	Multiple choice	Numeric response	Peer assessment	Role-play	Sequence response	Short answer	Simulation	Text matching	True/false	Website or publication	Wiki
Level 7																										
(K) 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	x		x		x				x	x					x	x	x	x	x	x		x			x	x
(K) critical awareness of knowledge issues in a field and at the interface between different fields					x				x		x							x				x			x	x
(S) specialised problem-solving skills required in research and/or innovation in order to develop new knowledge and procedures and to integrate knowledge from different fields	x			x	x	x			x		x							x	x						x	x
(C) manage and transform work or study contexts that are complex, unpredictable and require new strategic approaches					x				x		x		x					x	x			x			x	x
(C) take responsibility for contributing to professional knowledge and practice and/or for reviewing the strategic performance of teams		x				x			x		x		x					x	x			x			x	x
Level 8																										
(K) knowledge at the most frontier of a field of work or study and at the interface between fields				x	x	x			x	x	x		x					x							x	x
(S) the most advanced and specialised skills and techniques, including synthesis and evaluation, required to solve critical problems in research and/or innovation and to extend and redefine existing knowledge or professional practice				x	x	x			x	x			x		x			x				x			x	x

Table 4 (cont.): Matrix matching competences versus assessment (types levels 7 and 8)

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VIRQUAL

Network for integrating Virtual Mobility and European Qualification Framework in HE and CE Institutions

Reference: 143748-PT-KA3NW
Duration: 3 years
Key Activity 3 : ICT / network

PARTNERS

Universidade do Porto (project coordinator)
European University Continuing Education Network
Technische Universität Wien
Eesti Infotehnoloogia Sihtasutus
Gábor Dénes Foiskola
Orta Dogu Teknik Üniversitesi - Sürekli Egitim Merkezi
Universidade Aberta
TecMinho - Associação Universidade-Empresa para o Desenvolvimento
Verein zur Förderung des Einsatzes neuer Medien in der Aus-und Weiterbildung
Université de Genève

DATE

December 2011

EDITOR

Universidade do Porto

Education and Culture DG
Lifelong Learning Programme

Education and Training

This project has been funded with support from the European Commission. This publication reflects the views only of the author, and the Commission cannot be held responsible for any use which may be made of the information contained therein.