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Model for linking ECVET and ECTS

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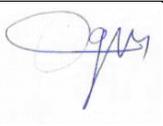
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ABSTRACT:

The PETRUS professional development program aims to bring together vocational training on nuclear waste management and formal academic training provided by the partner higher educational institutes. The objective is to provide qualification that can be achieved through both formal academic and Professional Development pathways and which can be mutually recognized by the nuclear waste management's stakeholders and participating academic institutions. For this purpose, it is essential to interconnect the two European instruments, namely ECVET and ECTS tools.

Signatures

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Abbreviations

PD	Professional development
KSC	Knowledge, skills and competences (attitudes)
ECTS	European Credit Transfer and Accumulation System
ECVET	European Credit system for Vocational Education and Training
VAE	Awarding academic credit for experience
MoU	memoranda of understanding
ENQA	European Network for Quality Assurance in Higher Education
IAEA	International Atomic Energy Association
IGD-TP	The European Technology Platform for Implementing Geological Disposal .
CMET	Working Group on the Competence Management, Educational and Training of IGD-TP

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Model for linking ECVET and ECTS

Introduction

The ECVET system has been created to promote transnational mobility primarily within the European Union and to facilitate lifelong learning. Consequently, ECVET systems are strongly supported as tools for implementing e.g. E&T supported by Euratom (van Goethem, 2012). As the tool of transnational mobility the objective of ECVET is to make credit transfer, accumulation and recognition easier through an agreed description method for learning outcomes. In evolving and restructuring labour markets, ECVET system can help lifelong development of new knowledge, skills and competences while utilizing in new career routes what has been learned in the past.

The principles of an ECVET include the documentation of the qualification system that is considered to provide the KSC- base for the entry route to professional practice. This means that the KSCs needed for qualification must be linked with expected learning outcomes defined as statements of what a learner is expected to know, understand and/or be able to do at the end of a period of learning. The qualification is described in terms of “units” of learning outcomes. Each of these units is associated with a certain number of “credit points” defined on the basis of common European guidelines in order to provide an illustration of the relative weight of the unit and associated learning outcomes in the over-all qualification. Learners can accumulate required units for a given qualification programme over time, in different countries, and in different learning situations (e.g. modular courses, practical training).

The ECVET program requires that the partners have mutual consent about the learning outcomes that expected to be achieved, the associated with ECVET points, the assessment criteria and methods as well as the validation and recognition of achieved learning outcomes. The principles and general

procedures applied will be agreed on the Memorandum of Understanding between the participating organization while practical terms of implementation of human mobility are described in the learning agreement between learner and training providers and the host institutes where the learner is accepted as a student.

The *European Credit Transfer and accumulation System* (ECTS) is applied in academic education within the European Higher Education Area. The ECTS system was developed as a part of the intra-European exchange system to allow European students to transfer credits taken in another European country to their home university. As a standard European students are expected to earn 30 ECTS credits per semester and 60 ECTS credits per academic year. Since one academic year of studies requires approximately 1600 hours of full-time work, which is equivalent to 60 credits (ECTS) one ECTS-credit corresponds to approximately 27 h of studies (including both contact teaching and individual and independent self-studies). The Bachelor's degree consists of 180 credits (ECTS) and the Master's degree of 120 credits (ECTS).

Comparison of the means to integrate vocational and non-formal training to formal academic training

Nuclear waste management programs in different EU-countries represent diversity in present stage of implementation as well as geological conditions, which is also reflected in level and diversity of the KSC-s needed by the professionals. Provision of an educational or training program that could fulfill the diverse needs for set for qualified persons would be an overwhelming task for any single institute or organization. Therefore, collaboration of educational institutes of higher education and the key beneficiaries of the will be needed. However, European educational institutes across the European Higher Education Area have committed to the Bologna process are also required to follow the agreed set of standards, procedures and guidelines on quality assurance' and to carrying out adequate peer reviews and accreditations of the educational programs. These standards require application of ECTS-based evaluation of the learning outcomes. This means that integration of the ECTS-based academic training to ECVET-unit-based cannot be avoided.

Previously, attempts to integrate ECTS-based training to ECVET systems include the EU-financed BE-TWIN project which has produced also a guideline document for relating ECTS-evaluated learning activities to learning out-comes and ECVET-units. The approach developed in BE-TWIN appears at first glance rather simple approach (Figure 1). In ECVET-program the total number of ECVET points are first allocated to a qualification as a whole and subsequently subdivided and allocated to each unit according to its relative importance within the qualification. In order to be in line with the ECTS system, 60 points should be allocated to the learning outcomes expected to be achieved in a year of formal full time vocational education and training. Subsequently, it would be possible to relate learning outcomes and the associated ECVET units and points to learning activities carried out in academic institutes that apply ECTS-credits by using a formula like:

$$1 \text{ ECTS} = X \text{ ECVET points (1),}$$

Where X is 1 if the 60 points correspond to learning activities achievable in one year.

		LEARNING ACTIVITIES						ECVET credit points
		L1	L2	L3	L4	L5	Ln	
UNITS OF LEARNING OUTCOMES	U1							...
	L01	*		*	*			
	L02			*				
	L03		*		*			
	U2							...
	L04		*					
	L05	*			*			
	L06							
	U3							...
	L07	*	*		*			
	L08							
	L09			*				
	U4							...
L010	*			*				
L011								
L012								
Un	
ECTS credit points			Total

Figure 1. Model matrix for linking ECVET and ECTS-systems applied in the BeTwin-project. The model assumes that the learning activities comprise “modules, course units, dissertation work, work placements and laboratory

work“ and are allocated with ECTS-credit points in academic institutions and lead to relevant learning outcomes of the ECVET-program.

However, the concept adopted in BETWIN-project is that learning activities comprise “*modules, course units, dissertation work, work placements and laboratory work*“. However, as recognized in the guidelines, learning activities commonly simply refer to lectures, seminars, projects, practical work, self-study and examination i.e. to activities carried out in single courses. Accordingly, in the curriculum of different Petrus partners, the terminology concerning learning activities varies as do the level how learning outcomes have been described in the course descriptions. In many universities the curriculums and course contents are a subject of changes and further development in the next few years due to institutional reorganisation and simply by ongoing implementation of the Bologna process. Since the number of universities participating to the Petrus III is substantial the strict adherence to the methodology proposed by BETWIN would lead to time-consuming and largely irrelevant comparisons concerning the objectives of ECVET-programs.

Alternative approaches for integration of vocational and academic training programs can be found in countries like France and Finland. The **VAE** or **Validation des Acquis de l'Expérience** is a procedure that allows educational institutions in France to grant degrees partly or completely based on work experience. A portfolio of the applicant's achievements and work experience is presented to a committee at the educational institution. The committee will then decide if the documents presented in the portfolio show work that merits partial credit towards a particular degree. In Finland, students in Aalto University can include the working experience and skills obtained in domestic or foreign companies in their bachelors-degree up to 4 credits (2+2 credits for domestic and foreign work experience respectively). A four weeks of work provides one academic credit. Thesis work in both in bachelor and masters-level (10 and 30 cr respectively) can involve practising in companies. The recommended page sizes of the thesis (15-25 and 45-75 respectively) for the thesis provides also guidelines how e.g. company or research project reports prepared as an individual work can be included to the degree and allocated with credits for completing certain courses e.g. “Special assignments in Geoengineering”-course. Concerning MS and PhD-studies, professors can accept an examination of reading assignments (books, scientific papers etc.). Guidelines for professors suggest that 1 credit should correspond to reading and examination of 70 pages of demanding scientific text. Posters and oral presentation in scientific congresses can be allocated also 1-2 or 2-3 credits respectively. The National Board of Education has also made recommendations also exist how much

time should be reserved for individual work i.e. self-studies for different forms of contact education. These values can be applied to estimate how much a vocational training (such as a course of groundwater modelling software) can be considered to involve self-study hours on top of the contact teaching depending on the type of activities (lectures, model calculations and exercises, laboratory or field tests, writing of a learning diary) are required from the learner.

The ECTS-ECVET-link proposed.

The strict adherence to linking procedures similar to those proposed in BETWIN-project would apparently require substantial harmonization of the terminology and course descriptions in different partner universities which would be beyond the objectives of the Petrus III-project or would not directly serve the objectives of EURATOM (van Goethem, 2012) on developing ECVET-programs as instruments of mobility and life-long learning. However, by planning the allocation of the ECVET-units so that 60 points corresponds approximately to 1 year of full-time study the ECVET (credit) points can be approximated to 1 ECTS as a guideline value for the credit transfer from which representatives of academic institutions can deviate for one direction or the other. The terms for recognition criteria and procedures as adequate for credit transfer and agreement for the comparability of qualifications for credit transfer and use will essential part of the Memorandum of Understanding in which the ECVET-partnership will be established. The attachments of MOE can include also more specific terms how learning outcomes relevant to ECVET-program that have been achieved outside of the formal academic training activities can be related to ECTS-credits. These terms can be utilized in formulation of learning agreements and for formal recognition of learning outcomes.

This means that Petrus consortium will focus on describing relevant job descriptions and learning outcomes following the ECVET-principles. The academic institutions providing courses for the PD-program would also provide a course description in which the learning activities relevant learning outcomes expected to be achieved are described. This would make possible for to use existing courses in academic institutions as a building stones of ECVET-program. QA/QC Standards for higher education require universities to assess of the student workloads in their in the course and program improvement procedures (following the Standards and Guidelines for Quality Assurance in the European Higher Education Area). The outcomes will provide means for (universities and PD-program

managers) to transfer non-formal training and vocational courses to ECTS-credit points which will enable ECVET-learners aim (also) to a formal academic degree (degree supplement, MSc or PhD, etc).