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A prototype of PD programme

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ABSTRACT:

The PETRUS professional development training program aims to bring together vocational training on nuclear waste management and formal academic training provided by the partner higher educational institutes.

The key knowledge, skills and competences (KSCs) required in different job-profiles in nuclear waste management sector have been compiled as a part of the program preparation and planning (WP1 and previous projects). The KSCs needed for qualification are linked with expected learning out comes 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 Petrus program can be completed in two years by full time studies. However, the program is essentially a vocational training program and consequently, the scheduling can be more flexible than in formal academic programs. The prerequisites for the students include a BSc or equivalent degree in relevant areas and entrance to the MSc-programs in one of the Petrus program partner universities. The studies must combine formal academic courses in the partner universities. Alternatively, the student can include to the program studies carried out by applying the PETRUS ECVET-procedures. These studies can comprise vocational courses, self-studies and practical training activities in relevant associated institutions defined in the MOU. The ECVET procedures require that the intended learning outcomes can be pre-described and linked to the Petrus ECVET qualification system and their evaluation and validation has been agreed by the sending and the receiving institute in the Learning Agreement which has been signed by the student and the official representatives of the sending and receiving institutes.

In order to integrate the achieved ECVET-points to an academic MSc-degree, they must be transferred to ECTS-credit points. The ECVET (credit) points can be approximated to 1 ECTS as a guideline value for the credit transfer. The attachments of MOE can include also specific terms how learning outcomes that have been achieved outside of the formal academic training activities can be related to ECTS-credits. Once the student has reached all the expected learning outcomes and the transfer to ECTS-credits has been completed, he or she can apply for the degree certificate of the ECVET-program and the diploma of the hosting university.

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

Table of Contents

Background.....	5
The key-elements	6
Steps toward implementation.....	7

Program prototype

Background

The aim of PETRUS III project is to build an effective collaboration on the professional development programme that provides qualification at the academic Master's level in radioactive waste disposal. This program integrates Academic formal training provided by partner universities to vocational training in research centers and waste management organizations.

The program is based on competence based curriculum delineated in collaboration with competence maintaining and E&T activities of nuclear waste management organizations responsible for geological disposal of radioactive waste in Europe. It combines two European system for education and professional training. *The European credit system for vocational training* system (ECVET) has been created to promote transnational mobility primarily within the European Union and to facilitate lifelong learning. The objective of ECVET is to make credit transfer, accumulation, and finally, the recognition of professional qualification through an agreed description method for learning outcomes. The *European Credit Transfer and accumulation System* (ECTS) is applied in academic education within the European Higher Education Area enabling European students to transfer credits taken in another European country to their home university.

Following the ECVET-principles, key knowledge, skills and competences (KSC) required in different job-profiles in nuclear waste management sector have been analysed as a part of the program preparation and planning. The KSC- bases considered to provide entry routes to professional practices in nuclear waste management have been used to delineate the Petrus ECVET qualification system. The KSCs needed for qualification are linked with expected learning out comes 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).

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). This means that academic institutes are expected to plan their course curriculums and course schedules so that full-time students can accomplish these degrees within 3 or 2 years, respectively.

The key-elements

The extent of the Petrus program consequently is such that it can be completed in two years by full time studies. However, the program is essentially a vocational training program and consequently, the scheduling can be more flexible than in formal academic programs.

The prerequisites for the students include a BSc or equivalent degree in relevant areas of geosciences or engineering as described in the job and professional profile descriptions (deliverables of WP1). He or she must also enter the MSc-programs in one of the Petrus program partner universities.

The studies will include formal academic courses in the partner universities. The focus is on achievement of the learning outcomes described in terms of Knowledge Skills and Competences relevant to the geological disposal. The studies can comprise courses given in the "home" university as a part of e.g. the Civil Engineering, Nuclear Engineering and Resource engineering programs or comprise courses arranged in the other partner universities which provide learning outcomes corresponding KSC's identified in the qualification system (i.e. the professional profiles and job descriptions).

Alternatively, the student can include to the program studies carried out by applying the PETRUS ECVET-procedures. These studies can comprise vocational courses, self-studies and practical training activities in relevant associated institutions defined in the MOU. The ECVET procedures require that the intended learning outcomes can be pre-described and linked to the Petrus ECVET qualification system and their evaluation and validation has been agreed by the sending and the receiving institute in the Learning Agreement (WP1 deliverable) which has been signed by the student and the official representatives of the sending and receiving institutes.

In order to integrate the achieved ECVET-points to an academic MSc-degree, they must be transferred to ECTS-credit points. Since the allocation of the ECVET-units have been done 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. Representatives of academic institutions can deviate for one direction or the other. The attachments of MOE can include also more specific terms how to relate to ECTS-credits learning outcomes that are relevant to ECVET-program but have been achieved outside of the formal academic training activities. Therefore, some indicative measures to link different forms of individual studies such report writing, group work and maintenance and ECTS-credit points have been given in the Deliverable report 2.2 based on Finnish recommendations. These terms can be utilized in formulation of learning agreements and for formal recognition of learning outcomes.

The terms for recognition criteria and procedures as adequate for credit transfer and agreement for the comparability of qualifications for credit transfer are defined in the final Memorandum of Understanding in which the ECVET-partnership will be formally established.

Once the student has reached all the expected learning outcomes and the transfer to ECTS-credits has been completed, he or she can apply for the degree certificate of the ECVET-program and the diploma of the hosting university. The education to be included will also include also commitment to quality management procedures which can involve cyclically repeated to maintain continuous quality control. These actions should comply with actions described in the deliverables of WP2 (D2.4).

Steps toward implementation

During the preparation of the Petrus-program some participating universities have gone through substantial changes in their organizational structure and course curriculum. Current course offerings and descriptions are organized under several different MSc-programs. Information of these courses is currently quite dispersed in different websites of academic institutions. The universities have also very different scheduling concerning the academic year. Therefore, a single potential student in academic institutes not to mention vocational students who work in relevant organizations can find it very difficult to tailor the studies to their needs.

Therefore, all the academic courses to be offered for the program and other already existing training materials should be reviewed and updated. Information should be made available through Petrus/ENEN webservices. Description of learning outcomes and KSC corresponding to the PETRUS ECVET system should be carried out in the partner universities and should be made available to the program managers. (The establishment of the management structure is one of the outputs of WP5).

Tailoring the study program and utilization of the courses by the students will require a comprehensive review and description of potential courses and their schedules and by the participating universities. Relevant courses for geological disposal are also offered and prepared by other organizations such as IAEA and other EU Euratom-projects such as ENETRAP III. Inclusion of relevant training outside the participating academic institutions and planning of studies in a point of view of a potential student would be strongly supported by developing a Software for Target-Oriented Personal Syllabus (STOPS)