

Methodology and course content

For ELOMPRES Project

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Table of contents

1. ECVET system	3
Introduction to ECVET	3
Guidance for describing units of learning outcomes	4
ECVET points	4
2. Methodology & pedagogy	5
Introduction	5
Methodology	5
Pedagogy in blended learning	6
3. Course content	9
4. Supporting documentation and sources	14

1. ECVET System

A. Introduction to ECVET

The European Credit System for Vocational Education and Training ('ECVET') is intended to facilitate the transfer, recognition and accumulation of assessed learning outcomes of individuals who are aiming to achieve a qualification. Facilitating recognition of professional skills and transnational mobility is the main objective of ECVET credit system (similar to ECTS in higher education). ECVET is a tool that can assist lifelong learning by improving transfer, recognition and accumulation of what has been learnt in the past. The core element of ECVET technical specifications is the use of learning outcomes, i.e. what a person know and is able to do. The assessment, validation and recognition of units enable credit transfer and accumulation. Credit transfer is defined as process through which learning outcomes achieved in one context can be taken into account in another context while credit accumulation is a process through which learners can acquire qualifications progressively by successive assessments of learning outcomes. ECVET can be used in a lifelong learning in different ways: progressively accumulating learning (credits), changing the pathway and qualification within the same qualification system, changing the pathway and qualification from one system to another, formalizing achieved learning outcomes, progressing or upgrading a qualification.

B. Guidance for describing units of learning outcomes

The crucial elements of the ECVET System are Learning Outcomes and Learning Units. Units should be constructed and organized in a coherent way with regard to the overall qualification. Learning Outcomes (LO) are statements of what the learner knows, understands and is able to do on the completion of a learning process. These are represented in terms of knowledge, skills and competences. To group the learning outcomes into units it is necessary to identify those outcomes that relate to each other. Learning outcomes can be grouped in a unit according to their relation to the same field of knowledge, skills or competence. Unit descriptions are crucial for the success of ECVET processes because they are the basis for the transparency of qualifications, it should be described in legible and understandable terms by referring to the knowledge, skills and competence contained in them. Unit description has two parts: an abstract containing a broad description of the learning outcomes (used for general communication) and the detailed description with information such as the assessment criteria used by teachers/trainers and should include:

- the procedures and criteria for assessment of these learning outcomes
- the ECVET points associated with the unit
- the validity in time of the unit, where relevant.

In order to be able to transfer credit achieved in different contexts, the competent institutions agree that the learning outcomes of a unit and the assessment standards in the host setting are comparable to those of a unit in the home setting. When using ECVET for mobility two approaches can be developer to identifying comparability of learning

outcomes in units:

- Identifying comparable units – units that exist in the qualifications systems of the partnership, which are considered comparable and can be transferred.
- Designing units 'open to mobility' – units designed specifically for geographical mobility purposes.

C. ECVET points

ECVET points are a numerical representation of the overall weight of learning outcomes in a qualification and of the relative weight of units in relation to the qualification. The number of ECVET points allocated to a unit provides the learners with information concerning the relative weight of what they have accumulated already and it also gives information concerning what remains to be achieved. Allocation of ECVET points to a qualification is based on using a convention according to which 60 points are allocated to the learning outcomes expected to be achieved in a year of formal full time vocational training. This does not mean that all learners have spent one year studying to achieve given qualification. Shorter or longer programmes leading to that qualification may exist and individual learner can take more or less time to achieve the expected learning outcomes. To decide on the number of ECVET points allocated to a qualification, one formal learning programme is chosen as a point of reference. The relative weight of a unit is established using one or a combination of the following approaches:

- the relative importance of the learning outcomes which constitute the unit for labour market participation, for progression to other qualification levels,
- the complexity, scope and volume of learning outcomes in the unit,
- the effort necessary for a learner to acquire the knowledge, skills and competence required for the unit.

ECVET points should not to be confused with credit used by higher education institutions. Credit designates the learning outcomes the learner has achieved while ECVET points provide information about the qualification and the units. Credits are related to a person and his/her personal achievement (credit does not exist on its own without someone having achieved it), ECVET points are linked to the qualification structure and description.

In case of ELOMPRES Project the ECVET methodology is based on learning outcomes only regardless the way are achieved (any form of training, including on-the-job training or self-study, can be taken into consideration). It is usually organized in a relatively short timeframe along with advanced contents and learning objectives. The process of attributing ECVET points starts with using learning paths and learner's workload as main criterion to attribute points. We use two coefficients for calculation and attribution of ECVET points: one related to European Qualifications Framework (EQF) and another one related to complexity of the each unit.

EQF coefficient is based on 8 reference levels, level 5 was chosen for the course 'Logistic Management in RES' (VET Higher Diploma). For this level EQF descriptors are as follows:

Knowledge	Skills	Competence
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

For this level EQF coefficient is equal 1,2. Complexity coefficient measures a relative complexity of the unit in comparison to the complexity of the whole qualification. Complexity is measured in terms of importance of learning outcomes to be achieved (within the range from 0.60 to 1.25). Complexity coefficient is used at unit level.

Entire course covers 180 hours and it is divided into 3 modules, each represents appropriate weight expressed in percentages (%) and 9 learning units.

ECVET points calculation:

Step 1

1 point corresponds 30 hours.

ECVET points = number of hours / 30 x EQF coefficient

Step 2

Unit points = (number of points according to unit's weight) x (complexity coefficient) x (unit's EQF coefficient)

Step 3

ECVET qualification points are calculated as a sum of unit's points.

2. Methodology and pedagogy

A. Introduction

This section describes chosen method for e-learning module and its advantages and comparing with more traditional method and techniques for design and preparation of e-learning material as well as pedagogical issues that are important for blended learning system, the role of tutors and their approaches to students activity.

B. Methodology

Technique selection process was determined by the following important factors:

- Ability to rapid preparation and conversion of learning modules.
- Relatively low pricing level.
- Easy and friendly management processes.
- Flexible and scalable solution that makes design and preparation process relatively shorter.
- Easy to implement in blended learning system.

and business objectives important from enterprises point of view:

- Effective learning delivering outcomes and results to learners as well as business.
- System that can reduce response time and development costs.
- Smart use of rapid tools to innovate.

Critical success factors that should be met for rapid e-learning system:

- All content transfer must happen in stage I, at the beginning.
- Ensure access to all relevant materials at the beginning of the course.
- Define course guideline and workflow upfront and share it with all learners.
- Use simple tool (PowerPoint for example) and user friendly templates.

Asynchronous e-learning model has been chosen because of its advantages especially in case of our blended learning system:

- Cost savings.
- More effective delivery of content.
- Enabling self-paced learning.
- Reduced training time.
- Allows learning 24/7.
- Trains large number of learners in a relatively short time.

Classroom activities for asynchronous learning:

Creating asynchronous activities is one of the most time – consuming of development processes, as such activities require attention to detail and usually a lot of programming. One of the most prevalent of rapid development techniques for asynchronous activities is to repurpose classroom activities that have already been developed for a stand – up class. This is a common practice simply because of the number of trainers who have been trying to repurpose entire classroom programs into asynchronous deliveries. The lack of a facilitator restricts the use of classroom activities significantly. Many classroom activities may be translated well to an asynchronous program and should be chosen well and develop intricately. Group - based activities will not translate well, as there is no group when we introduce learning in a self - instructional mode, but question/answer activities translate very well, as do simulations that are not team based.

Comparing to synchronous e-learning asynchronous one enable us to avoid some important disadvantages of the synchronous e-learning mode, such as:

- Requirement of proper communication software or technology.
- Ineffectiveness due to lack of trained facilitators.
- Special preparation of learners for a synchronous e – learning delivery.
- Lack of effectiveness when content requires face - to - face delivery.
- Not efficient when the class needs to be run many times.
- Lack of eye contact between facilitator and learners.
- Difficulties in obtaining positive reinforcement.

C. Pedagogy in blended learning

Pedagogy can be defined as the art of teaching. It refers to the strategies, methods and styles of instruction. The adoption of technology adds another element in course design to consider. To produce, effective online learning and teaching requires a comprehension of the processes by which students learn and interact with technology. Before new courses are created it is recommended that teachers acquire an understanding of the pedagogy which will underpin their online environment. This guide aims to provide the foundation by which teachers can comprehend the strategies for creating successful online courses.

Most good learning experiences usually take place in a special environment. By recreating the sensation of that special event learners can apply the lessons learnt then to different situations. This very much links to the concept of 'flow'. By remembering the sensation of special learning events it may be possible to enhance other learning situations.

Some tips for businesses:

We may see that businesses are facing challenges on an unprecedented scale and the retention of key employees is a major ongoing issue. More and more often employees equally are looking for organizations that value their contribution. One major way of helping all individuals fulfill their potential is to develop a coaching environment. This is very different from the process of 'managing' and could play a major role in the successful implementation of blended learning - a coach guides rather than manages. Managers need to forget about being in control, instead helping their team members to explore by asking open questions and being provocative. Trainers could also perform the role of a coach and may need to recognize that in the future classroom training may become much more focused on the individual, and as a result there may be more small discussion groups or one-to-one coaching than traditional classroom sessions. A major advantage is that if people really begin to adopt coaching behaviors the organization becomes much more of a learning environment and people start to learn from each other.

The role of the tutor

Supporting blended and online learning involves rethinking the role of the tutor, but it can also open up opportunities to coach and offer support. We can also develop materials, and

'e-tutor' through the virtual classroom. By rethinking some of the knowledge aspects we can make the actual physical training events very special. It is important for tutors to identify where their provision fits within the learning cycle. Their input fits within the overall concept of knowledge transfer that can be enhanced by helping learners learn through their senses. Therefore the more the tutor involves learners in their learning the more effective it will be (in our course this is very important for face-to-face part). A skilful and effective tutor will be closer to the role of the storyteller but however inspiring they are the limit of this presentation should be about 20 minutes.

A tutor designing and orchestrating a perfectly balanced event will need to provide a wide range of learning opportunities. We have to avoid situations where too many learners are being subjected to large classrooms of training content delivery, which only really serves the purpose of recording attendance. The real role of the trainer is to recognize what the learner needs to learn through classroom learning and to identify the value-added benefits. It will be important to look at each area of content and find the most effective way of delivering as well as to look at the overall content and identify whether the needs of people with different learning styles are being met.

Changes in blended course design influenced decisions about face-to-face meetings as much as online components. These changes can be organized around the purpose, number and duration of live meetings in blended courses. Initially, most instructors used the live meetings to cover topics that could not be easily done online and to coordinate upcoming learning activities. The presentations featured the traditional format of lecture/discussion and a PowerPoint. It was common for instructors and learners to arrive at live meetings with the entire course run off. The number of live meetings fluctuated between three and six.

A portion of the live meeting should be devoted to discussing upcoming projects and assignments and focused on learner objectives, and these centered on learning activities that could not be easily done online: role playing in counseling, individualized 'in the moment' reading lessons in literacy, group activities and simulations, requiring immediate feedback and interaction between and among participants. A session might be longer or shorter than the usual three hours, it might involve an individual meeting, small groups of learners.

Pedagogical instructions for tutors/instructors:

- Gaining attention from learners.
- Inform learners about goals and objectives.
- Stimulating learning and recalling of theoretical material needed for starting practical classes.
- Presenting good stimulus and interesting teaching materials.
- Providing learning guidance.
- Eliciting the performance that is especially important for practical classes.
- Giving feedback about performance correctness.
- Assessing the performance and the level of acquired knowledge.
- Enhancing retention and further knowledge transfer in business environment.

3. Course content

This section shows the course outline oriented to Polish case and developed by BSW (University of Bydgoszcz).

General description

Name of course	Logistic Management in Renewable Energy Sector
Generals Aims	To support renewable energy supply, energy production and distribution in small and large scale, support to develop cost-effective RES business,
Recipients	Managers, specialists in logistics, businessmen, SMEs owners, systems designers, students
Duration (total)	180 hours
Trainer profile	
<i>Degree</i>	Doctor or master degree, sustainable energy and logistics knowledge
<i>Experience</i>	RES and supply chain management and planning, financing and accounting, risk management
<i>Experience in training</i>	More than five years of experience as a trainee
Exploitation Plan	
Commercialization:	e-Learning platform, website, brochure for direct marketing, email campaign, announcements in printed media
Is there any alliance or external collaboration?	No
If answer is positive, please indicate it	n/a
Is there any practice or final project?	Yes
Describe it shortly and indicate its duration	165 hours, self-paced learning using Internet or downloaded lectures and 15 hours of practical learning in classes (workshops) on renewable energy production, systems and distribution, supply chain management in the field of RES for businessmen and managers.
Has the course certificate?	Yes
Will it be an official certificate?	Yes
If answer is positive, please indicate it	Certificate issued by partners organization
ECVET points	Yes (assigned to modules (EQF %) and to learning units (number))

Course content is divided into modules and learning units.

Name of Module	Energy
Name of Unit	Renewable energy production and consumption
Duration	3 hours
Aims:	Overall critical look at energy market and its regulations
Programme	1. Energy production trends, 2. Overall renewable energy production compared to traditional energy production, 3. National electric energy system, 4. Energy consumption, trends, 5. Energy production from various renewable sources (wind, solar, biomass, hydro), 6. Economics of energy market, 7. Small and large renewable energy systems for buildings and industry, 8. Current regulations, 9. Energy and environment protection
Methodology	1. Self learning materials given through e-learning platform. 2. Textbook in an electronic form, 3. Short presentation and discussion in the classroom. 4. Intrinsic test for acquired knowledge and understanding valuation.
Name of Unit	Characteristics of renewable energy sources and technologies
Duration	12 hours
Aims:	To give basic knowledge on various renewable energy resources and their use.
Programme	1. Wind energy, technology and environmental conditions, 2. Wind power stations, wind farms 3. Energetic biomasses, plant cultivation and crops 4. Biomass for heating and electric power production, 5. Biomass processing systems, 6. Biofuel technologies, small refineries, 7. Small hydropower stations, 8. Solar energy for heating and electric power production, photovoltaic cells and panels, 9. Waste materials in energy production, 10. Heating production and its influence on natural environment
Methodology	1. Self learning materials given through e-learning platform. 2. Textbook in an electronic form, 3. Presentation and discussion in the classroom, 4. 10 hours of placement learning, 5. Intrinsic test for acquired knowledge and understanding valuation
Name of module	Logistics

Name of Unit	Basis of supply chain management
Duration	30 hours
Aims:	To give basic knowledge on supply chain planning and management.
Programme	1. Supply chain structure, 2. Characteristics of processes in various renewable energy systems, 3. supply chain integration, 4. Waste materials management in the case of biomasses and biofuels, 5. Cost-effective RES management, 8. Supply chain planning, 9. Basis of marketing research
Methodology	1. Self learning materials given through e-learning platform. 2. Textbook in an electronic form, 3. Presentation and discussion in the classroom, 4. Five hours of practical classes, 5. Intrinsic test for acquired knowledge and understanding valuation. 6. Five hours in practical classes.
Name of Unit	Procurement Chain Management
Duration	25 hours
Aims:	To give basic knowledge and understanding of procurement planning and management.
Programme	1. Analyzing and choosing right supplier, 2. Energetic plants cultivation and crops, 3. Alternative sources, 4. Procurement planning, 5. Materials and resource management, 6. Order management; 7. Integration with other business processes, 8. IT systems for procurement management.
Methodology	1. Self learning materials given through e-learning platform. 2. Textbook in an electronic form, 3. Presentation and discussion in the classroom, 4. Five hours of practical classes, 5. Intrinsic test for acquired knowledge and understanding valuation
Name of Unit	Production Chain management
Duration	25 hours
Aims:	To give basic knowledge on production planning and management as well as various technologies.
Programme	1. Characteristics of production process for various renewable energy systems, 2. Production planning and scheduling, 3. Workflow optimization, 4. Strategic planning, 5. Production process integration with the business processes, 6. Heat production processes in large and small scales, 7. Electric power production processes in large and small scales, 8. Productivity, 9. Production logistics, 10. Dynamic process control, 11. Mobile (portable) production systems and devices. 12. Waste management.

Methodology	1. Self learning materials given through e-learning platform. 2. Textbook in an electronic form, 3. Presentation and discussion in the classroom, 4. 10 hours of practical classes, 5. Intrinsic test for acquired knowledge and understanding valuation
Name of Unit	Distribution Chain Management
Duration	25 hours
Aims:	To give basic knowledge on distribution planning and management
Programme	1. Market research, 2. Electric power grid system, 3. Heating distribution systems, 4. Demand assessment, 5. Distribution planning, 6. Pull and push distribution, 7. Distribution channels (small and large scales), 8. Shared distribution, 9. Continuous flow distribution, 9. IT systems for distribution planning and management.
Methodology	1. Self learning materials given through e-learning platform. 2. Textbook in an electronic form, 3. Presentation and discussion in the classroom, 4. Five hours of practical classes, 5. Intrinsic test for acquired knowledge and understanding valuation
Name of Unit	Transportation
Duration	10 hours
Aims:	To give basic knowledge on transport modes and safety regulations
Programme	1. Transportation modes, 2. Dangerous goods transport regulations, 3. Fleet management, 4. Cooperation with carriers, 5. Works transport, 6. Inbound logistics, 7. Coordinated transportation.
Methodology	1. Self learning materials given through e-learning platform. 2. Textbook in an electronic form, 3. Presentation and discussion in the classroom, 4. Intrinsic test for acquired knowledge and understanding valuation
Name of Module	Business
Name of Unit	Risk analysis and management
Duration	20 hours
Aims:	To give basic knowledge on risk management and analysis
Programme	1. Type of risks in RES sector, 2. Risk analysis, 3. Preventive activities and risk elimination, 4. Risk management, 5. Risk modeling.

Methodology	1. Self learning materials given through e-learning platform. 2. Textbook in an electronic form, 3. Presentation and discussion in the classroom, 4. Intrinsic test for acquired knowledge and understanding valuation. 5. Five hours in practical classes.
Name of Unit	Business Process Management
Duration	30 hours
Aims:	To give basic knowledge on business processes management
Programme	1. Type of business processes, 2. Proces flow analysis, 3. Processes flow planning, 4. Process integration. 5. Workflow management. 6. Financial resources. 7. Investment in new solutions.
Methodology	1. Self learning materials given through e-learning platform. 2. Textbook in an electronic form, 3. Presentation and discussion in the classroom, 4. Intrinsic test for acquired knowledge and understanding valuation. 5. Five hours practical classes.

4. Supporting documentation

Document	Description
Using ECVET to Support Lifelong Learning	Annotated examples of how ECVET can be used to support lifelong learning; ISBN 978-92-79-25003-3
ECVET Questions and Answers	EC Handbook on ECVET system, ISBN 978-92-79-19916-5

Website name	Description & link

[please list all important documents and websites that you used for preparing this report]