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1. INTRODUCTION

Construction and demolition waste (CDW) is one of the heaviest and most voluminous waste streams generated in the EU. It accounts for approximately 25% - 30% of all waste generated in the EU and consists of numerous materials, including and hazardous materials that pollutes nature, may have a negative impact on human health. The construction and demolition sectors are under increasing pressure to start applying C&D waste management procedures and use innovative waste quantity estimation and management technologies. This has generated the need to provide the construction sector with up-skilled construction site managers, properly trained and knowledgeable in C&D waste management procedures and technologies.

As the main result of the project will be the development of learning units and open training resources for up-skilling site managers in the area of construction and demolition waste management, it is important to give VET providers a practical guide to facilitate the integration of the developed learning outcomes and learning units into VET curricula for site managers.

This document will present guidelines and instructions to VET providers on a) how to implement training provision with the use of the CODESMA learning units, b) how to attribute the most appropriate reference levels to learning outcomes according to National Qualification Frameworks (NQF), and c) how to develop additional units, exercises, and assessment methodologies for their current training programmes and curricula.



2. PRECONDITIONS FOR INTEGRATION OF CODESMA LEARNING OUTCOMES

Updating or changing VET curricula is not a direct or easy process in all the cases. In the case of CODESMA learning outcomes this process depends mainly on two factors:

1. The correspondence of the CODESMA learning outcomes with existing learning outcomes in the current VET curricula for Site managers;
2. The autonomy of a VET provider to update or change the current curricula. In some countries, curriculum is defined primarily at the national level, while in other education systems curriculum is more a matter for local and even classroom-based decision-making.

The first step that a VET provider has to do is to analyse and compare the CODESMA defined learning outcomes with the current VET curricula for site managers.

To integrate those LOs that are not present, it is necessary to know whether the VET provider has autonomy to include them in their curricula. If that is the case, the integration can be done without any difficulty by adjusting the learning outcomes of the Site manager's qualification.

In any other case, the VET provider interested in delivery of the CODESMA learning outcomes has to use alternative solutions like defining new optional credits or define a special diploma for those students that do the training offered by CODESMA course.



3. LEARNING UNITS' INTEGRATION METHODOLOGY

In order to ensure that their organization will get the best results from the use of the CODESMA learning units, VET providers need to go through a sequence of processes in different phases of integration. The integration methodology can be implemented in four specific phases:

3.1. Phase 1: Prepare

- Identify an individual or team that will be responsible for undertaking the integration process in your organisation. Teamwork will ensure adopting a wider perspective, instead of a trainer's viewpoint only.
- Understand the factors that encourage change in the existing curriculum. Study CODESMA outputs. All outputs of the project are available online, on the official CODESMA website at <http://codesma.eu/>. The contact details of CODESMA partners are also available there, and can be used for establishing contact and discussing/clarifying terms and opportunities for using and promoting CODESMA results.
- Select the curriculum that is most suitable for integrating one or more CODESMA learning units. Go through existing curriculum offered by the school/organization (VET provider) targeting facilities management, taking into consideration:
 - the skills needs ranked by CODESMA partnership;
 - the relevance of content and objectives between existing and CODESMA learning units; and
 - demand for existing curricula, selecting the curriculum that could best integrate CODESMA learning units and offer added value to the organization and the market.
- Get feedback from stakeholders. Contact local construction and/or demolition companies, present CODESMA learning outcomes and consult on which of them would improve local site management skills.
- Define the revised learning objectives of the curriculum, based on the CODESMA learning units to be integrated. Following feedback from local stakeholders, decide on how CODESMA and existing learning units could be combined, and



define the main learning objectives of the new curriculum, which will be the axes for the design phase.

3.2. Phase 2: Design

- Define the main constraints for the design of the course. Consult with the VET provider's management/programme director and identify constraints related to:
 - a) Time available in the programme of the school/organization (e.g., will the curriculum be extended or will one or more existing learning units be replaced?);
 - b) Human resources available to design, implement and run the new curriculum (e.g. is the teaching staff qualified and able to teach the material or is there a need to train or hire new people?);
 - c) Time available until the release of the new curriculum;
 - d) Availability of teaching equipment for hands-on lessons (e.g., is there a need to acquire related equipment?);
 - e) Any other conditions that should be taken into consideration.
- Decide on potential existing learning units to be replaced by CODESMA ones. If, based on constraints above, the course duration cannot be extended and one or more learning units from the existing curriculum have to be replaced by new ones, break down the existing curriculum into its learning units and, after examining potential overlaps among them, decide on which of the existing learning units will be replaced.
- Check prerequisites' consistency of the selected CODESMA learning unit(s) to be integrated. Check it out whether knowledge and experience required for a student to attend the course are covered by the prerequisites of the existing curriculum. If so, CODESMA learning units can be used independently with the existing learning units. If not, CODESMA learning units should follow existing learning units that provide knowledge required. Ensure that the prerequisites of the CODESMA learning units to be integrated are added to the overall prerequisites of the curriculum.
- Define the sequence of learning units based on the prerequisites described above, as well as on a teaching flow that suits the objectives of the course.



- Adapt ECVET credits of the CODESMA learning units into the existing allocation system. As credit points are a numerical representation of the relative weight of units in relation to the qualification, the change-team consults on the weight of the new learning units compared to the existing ones and allocates credits accordingly.
- Calculate total duration of the curriculum, by aggregating contact, hands-on, self-study and assessment hours of new and existing learning units.
- Assign the National Qualification Level of the curriculum, based on the methodology described in section 5.
- Train (if needed) the teaching staff. Assuming that the teaching staff have adequate teaching experience/qualifications, a study of the CODESMA trainer handbook, which facilitates the integration of the CODESMA training and assessment material with the existing curriculum should be sufficient.
- Integrate learning materials. In collaboration with the teaching staff, integrate the existing learning material with CODESMA's Open Educational Resources, also available through a Vocational Open Online Course (VOOC), in order to support the new learning unit(s). The choice of approach and format for the existing curriculum depends on the overall strategy and common practices of the VET provider. Adopting those parts of the VOOC that are relevant to the learning units being integrated should be a choice for VET providers that are already experienced in using online tools for training. (No facilitator can be made available from the CODESMA partners, unless otherwise agreed with them.)
- Integrate assessment material. Modify the existing assessment procedures, either by using the assessment material suggested by the CODESMA partnership, or by developing new assessment materials, or both, in order to create a unified methodology that assesses the learning outcomes overall.

3.3. Phase 3: Run & Evaluate

- Run a course. A VET provider forms a group of students (at least 6) that meet the prerequisites. Alternatively trainers can assume the role of students, and the teaching staff delivers a mini course with the new learning unit(s) combined with the learning and assessment material.
- Evaluate the pilot course. Evaluate the learning process, based on feedback from teaching staff and learners. The evaluation tools will include personal



interviews and group discussions, focusing on the achievement of learning objectives and potential improvement.

3.4. Phase 4: Optimize & Run

- Optimize the curriculum. Based on the evaluation process, make any necessary amendments to the structure, content and materials of the curriculum in order to best meet learning objectives.
- Run the new curriculum. Proceed with any necessary promotional activities and run the course.



4. DEVELOPMENT METHODOLOGY OF ADDITIONAL UNITS, TRAINING RESOURCES AND ASSESSMENT PRACTICES

In case a VET provider needs to develop new, additional, units for site management skills on C&D waste management, all methodology followed by the CODESMA partnership for the development of CODESMA learning units is available through the deliverables of the CODESMA project on the official project website (<http://codesma.eu/>). The methodology comprises the following reports, which outline the steps followed by CODESMA partners, and could similarly be applied in extending the work of CODESMA to fit the needs of different / specialised target groups:

- Definition of research tools for data collection
- Data analysis and reporting on learning outcomes
- Grouping of learning outcomes into learning units
- Learning units' specifications

The development of the new learning units can be based on the four stage process, including a) Needs evaluation and Analysis, b) Curriculum Design, c) Content development, and d) Assessment and evaluation.

5. REFERENCING NATIONAL QUALIFICATIONS LEVELS TO THE EQF

5.1. What is referencing to the EQF

Referencing is the process that results in the establishment of a relationship between the levels of national qualifications - usually defined in terms of a national qualifications framework - and the levels of the European Qualification Framework (EQF). Through this process, national authorities responsible for qualifications systems, in cooperation with stakeholders responsible for developing and using qualifications, define the correspondence between the national qualifications system and the eight levels of the EQF.

5.2. How referencing is applied in CODESMA

Based on the European Qualification Framework descriptors and CODESMA learning outcomes in terms of skills, competence and knowledge, all CODESMA learning units have been attributed with Level 4 and Level 5. More specifically, Level 4 and Level 5 EQF descriptors for skills, competence and knowledge define the following:

EQF Level	Knowledge	Skills	Competence
Level 4	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	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
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CODESMA partners researched and consulted on how levels 4 and 5 of the EQF can be translated to each partnership country's NQF, so that VET providers in each country (Germany, Greece, Lithuania, Poland and the United Kingdom) can attribute the most appropriate level to the new curriculum.



5.3. German Qualification Framework Reference

NQF levels	Qualifications	EQF levels
5	<ul style="list-style-type: none"> IT specialist (certified), Service technician (certified) 	5
4	<ul style="list-style-type: none"> Dual VET (three-year and three-and-a-half-year training courses), Full-time vocational school (assistant occupations), Full vocational qualification (full-time vocational school) 	4

5.4. Greek Qualification Framework Reference

NQF levels	Qualifications	EQF levels
5	<ul style="list-style-type: none"> Vocational Upper Secondary School Degree (Certificate with apprenticeship class) Vocational Training Diploma (Initial Vocational Training / post-secondary level) Post-Secondary and not Higher Education Diploma / Degree 	5
4	<ul style="list-style-type: none"> Vocational Upper Secondary School Degree Vocational Upper Secondary School Certificate 	4



5.5. Lithuanian Qualification Framework Reference

NQF levels	Qualifications	EQF levels
5	<ul style="list-style-type: none"> VET diploma 	5
4	<ul style="list-style-type: none"> Maturity certificate (on completion of the secondary education programme and passing matura examinations) VET diploma (completion of initial and/or CVET at attainment level 3) 	4

5.6. Polish Qualification Framework Reference

NQF levels	Qualifications	EQF levels
5	<ul style="list-style-type: none"> Vocational diploma 	5
4	<ul style="list-style-type: none"> Matura certificate Vocational certificate Vocational diploma 	4

5.7. British Qualification Framework Reference

NQF levels	Qualifications	EQF levels
5	<ul style="list-style-type: none"> NVQ level 4 Higher national diplomas Vocational qualifications level 5 	5
4	<ul style="list-style-type: none"> Vocational qualifications level 4 Higher national certificates 	4



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