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WP4 – Learning Outcomes Validation and Recognition



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TABLE OF CONTENTS

1	Introduction	7
2	General considerations on EQF, ECVET and Learning Outcomes	8
2.1	The European Qualifications Framework (EQF)	8
2.1.1	Overview of National Qualifications Framework in partner countries.....	11
2.2	European Credit System for Vocational Education and Training (ECVET)	14
2.3	Learning outcomes approach	16
3	Implementation of assessment, validation and recognition processes	21
4	Definition of the common assessment system.....	23
4.1	The assessment process	23
4.2	The assessment methods.....	24
4.2.1	Guidelines for multiple choice test questions.....	25
4.3	The assessment criteria	26
4.3.1.	Multiple choice tests	27
4.3.2.	Assessment results – DTM Certificate	27
4.4	Final remarks on common assessment system.....	28
5	Conclusion.....	29



LIST OF TABLES

Table 1 - Descriptors defining levels in the EQF (source: Council Recommendation on the European Qualifications Framework (22 May 2017) https://publications.europa.eu/en/publication-detail/-/publication/ceead970-518f-11e7-a5ca01aa75ed71a1/language-en	10
Table 2 – Overview of National Qualifications Framework in partner countries (Cedefop, 2019).	13
Table 3 - Revised Bloom’s taxonomy – levels and action verbs.....	19
Table 4 - Describing learning outcomes following EQF system.	19
Table 5 - Information needed to describe learning outcomes.....	20
Table 6 – Grading system for multiple choice tests.	27
Table 7 - Assessment procedure for certification.....	28



LIST OF FIGURES

Figure 1 - Basic elements of ECVET (adapted from Cedefop, 2012)	14
Figure 2 - Description of qualifications in terms of units of learning outcomes)	15
Figure 3 - Implementation steps for validation and recognition of learning outcomes.	22
Figure 4 - Definition of the common assessment method for DTM online course.	25



1 Introduction

The Common Assessment System aims to identify and to agree on specific assessment methods for the different learning units, defined in WP3, to assess if learners have achieved the desired knowledge and skills, following the European Credit System for Vocational Education and Training (ECVET) principles. Thus, the units of learning outcomes are created and used to carry out the procedure of assessing, validating and recognising learning outcomes acquired by learners.

Before developing the specific assessment methods, the consortium agrees to develop a common terminology, respecting the contents and the objectives of Digital Transformation Manager (DTM) curricula. This common language is based on the European Qualification Framework (EQF) and on ECVET, considering the assumption that all forms of learning can be assessed in terms of learning outcomes.

The assessment of the learning outcomes refers to the process of evaluating knowledge, skills, responsibility and autonomy of a learner against predefined standards. Concerning the validation and recognition processes, developed afterwards, these will confirm that learning outcomes were assessed, corresponding to specific outcomes demanded by a unit or by all the qualification.

Thus, a common assessment system should define the methodology to assess learning outcomes, to validate and to recognise them. The theoretical framework and the logical succession of the procedures that will be developed on this project, as well as methods and tools are addressed on this document.

The participants in the DITRAMA training course will be able to assess their knowledge at the end of each one of the training units and after complete their learning process. 100 learning pills, elaborated in WP5, will be available on DITRAMA learning platform allowing the participants to acquire and to develop the required knowledge, needed to access the final assessment. Learners that will successfully pass all units tests will get a DTM Certificate, containing the identification of all its learning units. For students that are enrolled in separate learning units, once they successfully complete a learning unit, they will receive a certificate with their name, the number of training hours of the learning unit and the list of pills that are part of the unit. Learners can also request a partial certificate when complete the alternative reduced training path of the alternative curriculum for other professional profiles as detailed in the D3.1 DTM curriculum document or complete specific units.

The different curriculum and the related certifications will be taken into consideration in the DITRAMA e-learning platform.



2 General considerations on EQF, ECVET and Learning Outcomes

2.1 The European Qualifications Framework (EQF)

The European Qualifications Framework (EQF) is a reference tool, a translation device for national qualifications systems and frameworks, which means that qualifications, that means what people know, understand and are able to do, are not directly included in the EQF, but in National Qualifications Framework, where their level and value abroad can be understood with reference to the eight EQF levels.

The European Qualifications Framework for lifelong learning (EQF) aims to improve the transparency, comparability and portability of people's qualifications. The EQF was set up in 2008 as a common reference framework of qualifications, expressed as learning outcomes at increasing levels of proficiency. The framework serves as a translation device between different qualifications systems and their levels. It is intended to benefit learners, workers, job-seekers, employers, trade unions, education and training providers, qualification recognition bodies, government authorities and international organisations.

The EQF is a common reference framework that allows qualifications from different countries to be compared easily. This is achieved by supporting the use of learning outcomes for each qualification, in order to make them more transparent and easier to understand. In this way, the EQF supports the cross-border mobility of learners and workers, and promotes lifelong learning and professional development across Europe.

The EQF, and all National Qualifications Frameworks (NQFs), that have been referenced to it, follow a learning outcomes approach. This means that both the content and the level of a qualification reflect what holders are expected to know, understand and be able to do (learning outcomes).

A learning outcomes approach further supports a better match between the skills needs of the labour market and education and training provision, while also facilitating the validation of learning acquired in different settings. By focusing on what a learner knows, can do and can understand, learning outcomes help to open up qualifications to a wider variety of learning pathways and experiences.

The EQF is defined by eight learning outcomes-based levels¹. Accompanying level descriptors show how expectations of knowledge, skills, autonomy and responsibility increase as learners progress from level 1 to level 8. These levels, along with the descriptors, function as a translation grid and make it possible to compare qualifications from different countries and institutions.

The EQF learning outcome descriptors reflect two dimensions: the levels and the learning domains.

¹ Council Recommendation on the European Qualifications Framework (22 May 2017) <https://publications.europa.eu/en/publication-detail/-/publication/cee970-518f-11e7-a5ca01aa75ed71a1/language-en>.



The *level dimension* captures how the complexity of the learning outcomes increases along with the qualification levels. For example, the level of autonomy expected of the holder of a level 2 qualification is much less than the expectations of a level 7 qualification holder.

The *learning domains* dimension distinguishes between *knowledge, skills and autonomy and responsibility*, allowing different types of qualifications to be classified at the same level. For example, qualifications with the same overall learning outcomes level can be of a more academic, vocational or professional orientation.

Considering these main concepts framed in the EQF (table below) and the DTM occupational profile, it is expected to define for DITRAMA training course a EQF 5 level qualification for those learners successfully implementing all course pills (whole training path). In addition, partners have developed a partial certification foreseen for those learners successfully implementing the reduced training path or specific units as defined in D3.1 to which a 4 EQF level is related.

EQF level	Knowledge	Skills	Responsibility and autonomy
	<i>In the context of EQF, knowledge is described as theoretical and/or factual.</i>	<i>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).</i>	<i>In the context of the EQF responsibility and autonomy is described as the ability of the learner to apply knowledge and skills autonomously and with responsibility.</i>
Level 1 Relevant learning outcomes	Basic general knowledge	Basic skills required to carry out simple tasks	Work or study under direct supervision in a structured context
Level 2 Relevant learning outcomes	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 Relevant learning outcomes	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



EQF level	Knowledge	Skills	Responsibility and autonomy
Level 4 Relevant learning outcomes	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 Relevant learning outcomes	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 Relevant learning outcomes	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 Relevant learning outcomes	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 Relevant learning outcomes	Knowledge at the most advanced frontier of a field of work or study and at the interface between fields	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 1 - Descriptors defining levels in the EQF (source: Council Recommendation on the European Qualifications Framework (22 May 2017) <https://publications.europa.eu/en/publication-detail/-/publication/ceed970-518f-11e7-a5ca01aa75ed71a1/language-en>).

Also, considering the focus on learning outcomes, to what a person knows, understands and is able to do on completion of a learning process, it is also important to distinguish different types and ways of learning:

a) Formal Learning



Learning occurs in an organised and structured environment (e.g. in an education or training institution). It is an intentional process from the learner's point of view and leads to validation and certification².

b) Non-Formal Learning

Non-formal learning is not provided by an education or training institution and typically does not lead to certification; however, non-formal learning is intentional on the part of the learner and has structured objectives, learning time and learner support³.

c) Informal Learning

Informal learning results from daily activities related to work, family life or leisure, it is not structured and most often does not lead to certification; in most cases, informal learning is unintentional on the part of the learner⁴.

European recommendations underlined the necessity of the Member States enable individuals to obtain a full qualification or, if not possible, a part of the qualification on the basis of validated non-formal and informal learning. Validation arrangements must be linked to national qualifications frameworks and in line with European qualifications framework.

Therefore, EQF takes into account the diversity of national systems, facilitating translation and comparison of qualifications between countries.

2.1.1 Overview of National Qualifications Framework in partner countries

Taking into consideration the principles and tools from European Qualifications Framework (EQF) and from the National Qualifications Framework (NQF), partners will work together to validate the new join curriculum, by validating its learning objectives, learning path and units and related ECVET points (WP3). As already mentioned, the estimated EQF level for this curriculum is 5, when entirely successfully implemented.

As referred before, EQF is the European reference tool, a translation device for national qualifications systems and frameworks, which means that qualifications are not directly included in the EQF, but in NQF, where their level and value abroad can be understood with reference to the eight EQF levels. Integrating and coordinating qualifications obtained within the different subsystems of education and training (education, vocational training, higher education) within a single framework represents a big challenge for national public bodies, even more when it is also considered knowledge, skills and competences acquired in non-formal and informal contexts. This is why, it is so important to know exactly how partner countries are considering the implementation and use of EQF to understand how they will manage the new join curriculum at the national level.

These national frameworks draw attention to the outcomes of education and training systems, focusing on what learners are expected to know, understand and are able to do. Learning outcomes-based level descriptors are essential to these frameworks. Actually,

² www.ecvet-toolkit.eu/tools-examples-more/glossary/letter_f

³ www.ecvet-toolkit.eu/tools-examples-more/glossary/letter_n

⁴ idem



this information will be essential for the formal recognition of the new qualification at European level within and outside the participating countries.

Regarding the partners' countries of this consortium, the situation is quite homogenous in a way that almost all of them have their NQF linked to EQF. Thus, the implementation of the new joint curriculum will be facilitated from this point of view. The only exception is Spain. A Royal Decree, that will establish the foundations for the development and implementation of NQF, is currently under preparation. So, the situation is as follows⁵:

Country	Scope of the framework	Number of levels	Level descriptors	NQF linked to EQF
Belgium	Designed as a comprehensive framework; including all levels and types of qualification from formal education and training and from the professional qualifications system. It currently includes vocational and secondary general education qualifications and qualifications awarded through validation at levels 2, 3, 4 and 5, as well as HE qualifications at levels 6 and 7.	Eight	<ul style="list-style-type: none"> • knowledge/skills • Context/ autonomy/ responsibility 	2013
Czech Republic	National framework for vocational qualifications in VNFIL (the national register of qualifications – NSK) and the higher education qualifications framework.	Eight in NSK	National framework for vocational qualifications in VNFIL: <ul style="list-style-type: none"> • Competences (including knowledge and skills) 	2011
Denmark	Comprehensive NQF including all levels and types of qualification from formal education and training. Open to those awarded outside formal education and training. No qualification linked to EQF level 1.	Eight	<ul style="list-style-type: none"> • Knowledge • Skills • Competence 	2011
Italy	Designed as a comprehensive framework; it will include all levels and types of qualification from formal education and training and regional qualifications.	Eight	<ul style="list-style-type: none"> • knowledge • Skills • Autonomy and responsibility 	2013 major national qualifications from formal education and training linked directly to EQF
Poland	Comprehensive NQF including all levels and types of qualification from formal education and training. Open to regulated and nonstatutory qualifications awarded outside formal education and training.	Eight	<ul style="list-style-type: none"> • Knowledge • Skills • Social competence 	2013
Portugal	Comprehensive NQF including all levels and types of qualification from formal education and training and from the national system for the recognition, validation and certification of competences.	Eight	<ul style="list-style-type: none"> • Knowledge • Skills • Attitudes 	2011
Romania	Comprehensive NQF including all levels and types of qualification from formal education and training. Open to qualifications obtained through validation of non-formal and informal learning.	Eight	<ul style="list-style-type: none"> • Knowledge • Skills • Responsibility and autonomy 	2018

⁵ Overview of National Qualifications Framework, Developments in 2019, Cedefop.



Country	Scope of the framework	Number of levels	Level descriptors	NQF linked to EQF
Spain	Designed as a comprehensive NQF for lifelong learning; will include all levels and types of qualification from formal education and training.	Eight proposed	<ul style="list-style-type: none"> • Knowledge • Skills and abilities • Competence 	-

Table 2 – Overview of National Qualifications Framework in partner countries (Cedefop, 2019).

Considering the EQF, European countries were triggered by it and they are influenced by the European level descriptors and levels. Nevertheless, they have found their path, to develop and to implement the framework at national level, using different strategies⁶, more or less aligned with EQF descriptors. Basically, three situations can be identified:

a) Close alignment to EQF descriptors.

A first group of countries uses the EQF descriptors directly or aligns closely to them. From this consortium, Portugal and Romania are examples. Most of these countries have, however, prepared additional explanatory tables or guides with more detailed descriptors to support consistent application across different parts of the education and training system and for different applications of learning outcomes.

Portugal has drafted guidelines in which a more detailed and fine-tuned description of knowledge, skills, attitudes and context is provided. In the case of knowledge, for example, a distinction is made between depth of knowledge and understanding and critical thinking. The skills domain (also identified as know-how) is characterised by depth and breadth and purpose. The third column covers attitudes (defined as autonomy and responsibility). A context column has been added, defining context of application, predictability and complexity.

b) Broadening the EQF descriptors.

A second group of countries is influenced by the EQF descriptors, but has broadened and partly reoriented their descriptors, from this consortium we have Denmark and Poland as examples. All these countries use knowledge and skills as headlines for the first and second column of learning domains but have renamed and reoriented the third column to varying degrees. For knowledge, many countries go beyond the dimensions of theoretical and/or factual knowledge introduced by the EQF and refer to 'systematic knowledge', 'knowledge of a subject' and 'comprehensive knowledge related to knowledge domain or discipline'. In some countries, the articulation of knowledge is closely linked to, and inspired by, the national curriculum and its emphasis on progressive mastery of knowledge through the education process.

c) Emphasising a comprehensive notion of competence.

Interpretation of competence is particularly important for developing and agreeing on level descriptors. A third group of countries see competence as an overarching concept, significantly influencing the way learning outcomes are defined and described in level descriptors. This approach is exemplified, in this consortium, by Belgium (Flemish, French and German communities). These countries emphasise the holistic character of the term competence. According to this approach, knowledge, skills and attitudes are not atomised entities which can be judged in

⁶ Cedefop (2018). Analysis and overview of NQF level descriptors in European countries. Luxembourg: Publications Office. Cedefop research paper; No 66.

isolation from each other; individuals have to combine and apply them in the concrete contexts provided by work and learning. The ability of an individual to act in a self-directed way is seen as crucial to the understanding of competence and allows differentiation between competence levels. It focuses on the ability of a person to use knowledge, skills, attitudes and other personal, social and/or methodological abilities – in a self-directed way – in work and study situations and to deal with complexity, unpredictability and change.

2.2 European Credit System for Vocational Education and Training (ECVET)

The European Credit System for Vocational Education and Training (ECVET) is the common methodological framework that facilitates the accumulation and transfer of credits attributed to learning outcomes from one qualification system to another. It applies to all learning outcomes achieved by an individual through different teaching and learning pathways and is then transferred, recognized and accumulated for qualification. ECVET allows to validate and to recognize learning outcomes in different contexts, whether through a formal, informal or non-formal learning path taken in European countries. Learning outcomes can be transferred to the home context of the person concerned for accumulation and qualification. In this way, ECVET facilitates mobility across Europe.

ECVET becomes relevant because it values and reinforces the importance of the learning outcomes that are acquired outside formal education processes and/or outside the home country.

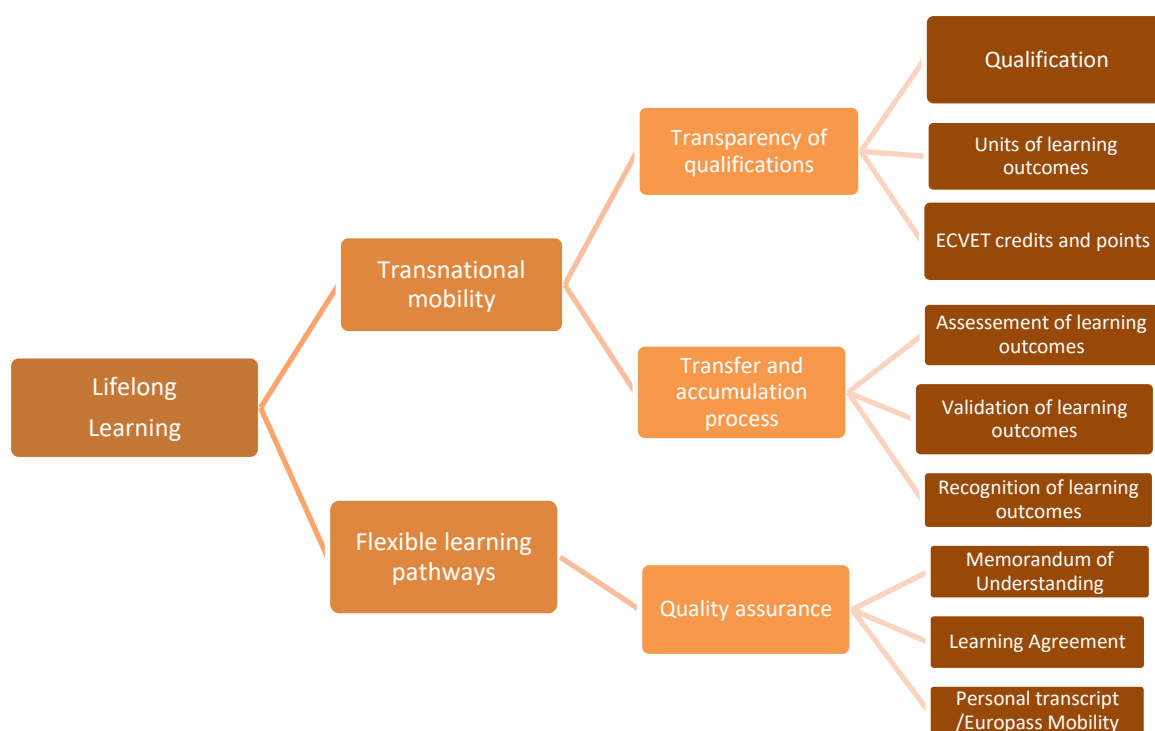


Figure 1 - Basic elements of ECVET (adapted from Cedefop, 2012)

ECVET uses a credit system, specifically a numerical representation for a unit of learning outcomes considering the overall number of units of learning outcomes and/or the overall

qualification. The relative weight of a unit is established using one or a combination of the following approaches:

- a) The relative importance of the learning outcomes which constitute the unit for labour market (e.g. units identify as core to the professional profile, must have a higher number of ECVET points).
- b) The complexity, scope and volume of learning outcomes in the unit.
- c) The effort necessary for a learner to acquire the knowledge, skills and competence required for a unit.

In ECVET the allocation of points usually has two phases: first, points are allocated to a qualification as a whole and then to its units. The convention used for the calculation of ECVET points is: 60 points are allocated to the learning outcomes expected to be achieved in a year of formal full time VET.

In DITRAMA the assignment of the ECVET points for each Learning Unit, needed time and credits, will be made on WP3, with the support of ECVET toolkit.

Successful ECVET implementation requires that qualifications be described in terms of learning outcomes, with learning outcomes brought together in units, and units often accumulated to form the basis of qualifications or awards:

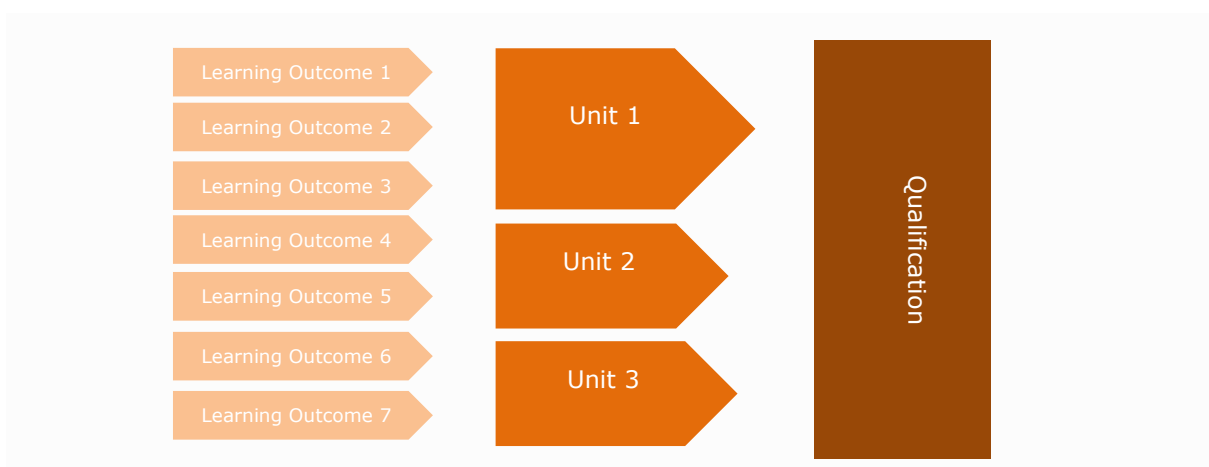


Figure 2 - Description of qualifications in terms of units of learning outcomes (source: <http://www.ecvet-toolkit.eu/ecvet-toolkit/identify-units-learning-outcomes>).

Assessment, validation and recognition processes must also be agreed, among all those participating, and should respect existing national, regional, sectorial or institutional practice⁷.

ECVET users are able to benefit from the use of common European documents, or templates, that promote quality in learning mobility, namely:

- Memorandum of Understanding (MoU): a voluntary agreement, between competent institutions, which sets out the framework for credit transfer and accumulation; the

⁷ ecvet-toolkit.eu/introduction/ecvet-principles-and-technical-components



MoU formalises the ECVET relationship through confirming mutual acceptance of the status of, and the procedures put in place by, competent institutions.

- *Learning Agreement (LA): a contract signed by all mobility parties, including the learner, in which the learning duration and expected learning outcomes are confirmed alongside mechanisms for assessment, validation and recognition.*

2.3 Learning outcomes approach

Learning outcomes are statements of what a learner knows, understands and is able to do on completion of a learning process. **Learning outcomes are defined in terms of knowledge, skills and competence**⁸.

- **Knowledge** means the body of facts, principles, theories and practices that is related to a field of work or study. It is described as theoretical and/or factual knowledge;
- **Skills** means the ability to apply knowledge and use know-how to complete tasks and solve problems. They are described as cognitive (logical, intuitive and creative thinking) or practical (involving manual dexterity and the use of methods, materials, tools and instruments);
- **Competence** means the proven ability to use knowledge, skills and personal, social and methodological abilities in work or study situations and in professional and personal development. It is described in **terms of responsibility and autonomy**.

The learning outcomes in DITRAMA will be defined considering the deliverables worked in WP3 – New Join Curriculum and in WP5 – Training Material. In WP5, 100 training pills were developed integrating specific knowledge and the respective learning outcomes, that is, what is expected a learner knows within the scope of that training pill. This way, there will be a micro and detailed definition of the learning outcomes considering the sum of the knowledge included in those 100 training pills.

The training pills will be properly aggregate and distribute by learning units (WP3), based upon the outcomes of the results of the WP2 – Fine tune skills and knowledge needs of the sector. Each learning unit will represent a coherent part of the new join curriculum DTM. For each one of these learning units, learning outcomes will be described in relation to specific knowledge, skills, responsibility and autonomy in order to guarantee that the joint curriculum matches competencies needs for the DTM. For the definition of the learning outcomes, it will be considered those specific learning outcomes identify in the training pills defined in WP5.

There are some **practical guidelines to define learning outcomes**. These will be considered to identify and to describe all the learning outcomes, whether they are defined in the training pills or in the learning units.

⁸ Recommendation of the European Parliament and of the Council on the Establishment of a European Qualifications Framework for Lifelong Learning, 2008



A **unit of learning outcomes** is a component of a qualification consisting of a coherent set of knowledge, skills and competence that can be assessed and validated. This presupposes that the units of learning outcomes are structured comprehensively and logically and that they can be examined. Units of learning outcomes can be specific to a single qualification or common to several qualifications and may also describe so-called additional qualifications which are not part of a formal qualification or curriculum.

Some **criteria** must be taken into account to support the definition of the units of learning outcomes:

- Units of learning outcomes should be designed in such a way that they can be completed as independently as possible of other units of learning outcomes.
- Units of learning outcomes should include all necessary learning outcomes, i.e. they should describe professional competences, but also the necessary social and personal competences in this context.
- Units of learning outcomes should be structured and dimensioned in such a way that the relevant learning outcomes can actually be achieved in the given time.
- Units of learning outcomes should be assessable. Orienting units of learning outcomes towards occupational activities and tasks makes it easier to determine assessment criteria.

Learning outcomes should be **formulated** considering that it will be understandable and manageable for all those involved:

- Learning outcomes refer to vocational qualifications based on the learning achievements of an average learner. Learning outcomes are described from the perspective of the learner, not from the perspective of the teacher.
- General training plans, curricula or qualification profiles can form the basis for describing learning outcomes in transnational mobility.
- Learning outcomes should be verifiable and assessable. Learning outcomes should be described in as concrete terms as possible so that it can be determined within the framework of an evaluation process whether the learner has achieved the learning outcomes. The learning outcomes should, however, be formulated in such a way as to also enable the learners to judge whether the results have actually been achieved.
- The nature of the learning process and the learning method itself are not relevant for the description of learning outcomes.
- The question of whether learning outcomes in the form of knowledge, skills and competences within a unit of learning outcomes are described in detail or in a less complex form depends on the respective context. A general principle, there should neither be too many nor too few learning outcomes.



To **describe the learning outcomes**, some basic principles should be followed in order to make them more easily understood and more clear and objective.

- **Use of active verbs** - verbs should describe measurable or observable actions, e.g. "identify", "explain", "compare", "classify", "apply" (Table n.º 2 action verbs for creating learning outcomes, based on Bloom's taxonomy). Writing precise learning outcomes requires that ambiguous verbs be avoided (such as "know", "understand" and "be aware of").
- **Specification and contextualization of the active verb** – it should be described what type of activity is involved. The learning outcome formulation should consist of a verb, an object and a context, e.g. "use information and communication technologies taking into account data protection requirements".
- **Clear, concise and precise language** – learning outcomes should be described briefly and precisely, complicated sentences and ambiguous words should be avoided.
- **Description of the minimum demands for validating a unit of learning of outcomes** – all learning outcomes which are necessary for fulfilling the tasks, the all activity, should be listed.
- **Comprehensive description of the qualification level** – in the formulation of the learning outcomes, verbs and adjectives should reflect the level of qualification (EQF), in terms of knowledge, skills and competence (responsibility and autonomy).

To write learning outcomes, it is common to use the Bloom taxonomy (Bloom, 1972, revised by Anderson and Krathwohl, 2001) which provides a hierarchy of complex processes and for each one propose a list of active verbs that can be used to describe them:

LEVELS IN COGNITIVE DOMAIN	ACTION VERBS (examples)
<p>1. Knowledge/Remembering Exhibit memory of previously learned material by recalling facts, terms, basic concepts, and answers.</p>	<p>Define, select, define, list, recognize.</p>
<p>2. Comprehension/Understanding Demonstrate understanding of facts and Ideas by organizing, comparing, translating, interpreting, giving descriptions, and stating main ideas.</p>	<p>Characterize, describe, explain, identify, locate, recognize, sort.</p>
<p>3. Application/Applying Solve problems to new situations by applying acquired knowledge, facts, techniques and rules in a different way.</p>	<p>Choose, demonstrate, implement, perform.</p>



4. Analyses/Analysing Examine and break information into parts by identifying motives or causes. Make inferences and find evidence to support generalizations.	Analyse, categorize, compare, differentiate.
5. Evaluation/Evaluating Present and defend opinions by making judgments about information, validity of ideas, or quality of work based on a set of criteria.	Assess, critique, evaluate, rank, rate.
6. Synthesis/Creating Compile information together in a different way by combining elements in a new pattern or proposing alternative solutions.	Construct, design, formulate, organize, synthesize.

Table 3 - Revised Bloom's taxonomy – levels and action verbs.

There are some principles that support the presentation of learning outcomes to be done, in this project, in WP3. Their description, following the EQF system, can be presented as follows:

DESCRIBING LEARNING OUTCOMES FOLLOWING EQF SYSTEM		
Learning Unit	Title of the unit	
He/she is able to (summary description)		
Knowledge	Skills	Responsibility and autonomy
He/she is able to describe, to explain...	He/she is able to analyse data, develop a plan...	He/she is responsible for supervising, for problem solving...

Table 4 - Describing learning outcomes following EQF system.

The ECVET Recommendation⁹ suggests that the description of a unit should include the information presented below:

Unit 1	
Title of the unit	
Qualification title	

⁹ Defining, writing and applying learning outcomes, CEDEFOP, 2017.



EQF level	
Learning outcomes contained in the unit	By completion of this unit the learner should be able to: - - -
Procedures and criteria for assessment of these learning outcomes	
ECVET points associated with the unit	
Validity in time of the unit, when relevant	

Table 5 - Information needed to describe learning outcomes.

All these guidelines will be considered to define the learning outcomes in training pills as well to describe, in a more complete and integrated way, the learning outcomes in WP3, where all the information will be available.



3 Implementation of assessment, validation and recognition processes

The creation and use of learning outcomes enables the procedure of assessing, validating and recognising learning outcomes that are acquiring by learners in different contexts (formal learning, non-formal learning and informal learning). In DITRAMA Project, only the assessment process will be implemented, being considered for that the knowledge acquired by learners and participants on the training course. It is not objective to arrive the official recognition.

Anyway, we will explain how it works in order to guide other entities to do it, presenting the main concepts related.

The assessment of learning outcomes means *methods and processes* used to establish the extent to which a learner has attained particular knowledge, skills and competence. Generally, requisites are asked to access this assessment process, as examples we can refer that learners must have, at least, the level 4 of qualification, professional experience and/or education and training on the related sector and present a complete curriculum vitae as well an educational certificate.

Regarding the assessment process to be developed on this Alliance, and needed requirements for pilot course learners, they will be defined in WP7.

The validation of learning outcomes means the *process of confirming* that certain assessed learning outcomes achieved by a learner, in a formal, non-formal or informal setting, correspond to specific outcomes which may be required for a unit or a qualification.

The recognition of learning outcomes means the *process of attesting officially* achieved learning outcomes through the awarding of units or qualifications.

In short, the units of learning outcomes identified and described in WP3, as components of the DTM join curriculum, are the core of the assessment, validation and recognition processes. In DITRAMA, the learning outcomes derive from the Digital Transformation Manager (DTM) occupational profile, based upon the outcomes of the results of the WP2 – Fine tune of the skills and knowledge needs of the sector and they are defined according the following steps:

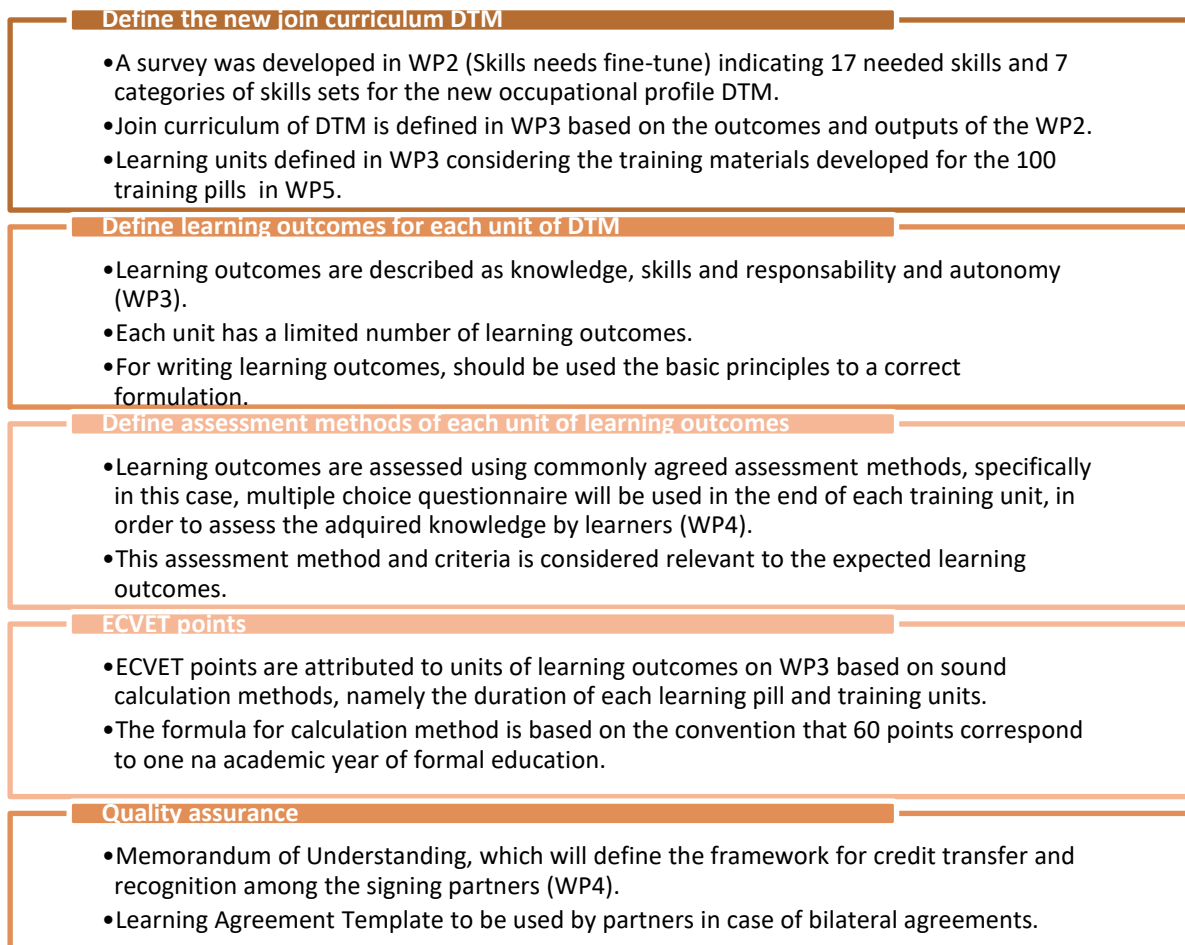


Figure 3 - Implementation steps for validation and recognition of learning outcomes.



4 Definition of the common assessment system

4.1 The assessment process

The use of learning outcomes developed in WP3 guides the development of learning contents, learning methods (WP5) and assessment methods (WP4).

The consortium agrees on the common assessment methods presented on this deliverable, that will be adopted to assess the preparation of learners in each learning unit. These assessment methods will be used in the pilot course in every partner countries. Thus, and after the pilot course, a revision and improvement of the assessment methods will be undertaken.

The assessment refers to the process in which an individual's learning outcomes are compared against the specific qualification. The methodology used on this process is crucial to give the necessary credibility of validation of non-formal and informal learning.

Considering this, when learners finish the learning process, they must demonstrate the achievement of the expected learning outcomes. This process may combine, in general, different existing methods consistent with the learning outcomes and the learning activities, including evaluation of written and documentary evidence, but also other forms of evidence¹⁰. Many of these methods and tools are based, or similar, to those used in formal education and training and might include, among others:

- *Self-assessment*
- *Written assignments*
- *Oral and written tests*
- *Interviews*
- *Skills demonstration*
- *Portfolio*
- *Essays*
- *Exams (theoretical and/or practical)*
- *Presentations*
- *Simulated conversations*

Considering the DITRAMA purposes, the assessment of the learning outcomes (defined in WP3), within the Alliance, will be supported on multiple choice tests to be made in the end of each training module or learning unit, that is, each of the participants on the training course will be able to access the automatic assessment included on the training course platform.

In DITRAMA assessment process, carried out online, only knowledge will be assessed, not competences. Nevertheless, this is an assessment procedure considered suitable for the

¹⁰ *European guidelines for validating non-formal and informal learning*, CEDEFOP, 2015.



objectives of the project and should provide clear assessment of specific knowledge guaranteeing high levels of objectivity, validity, reliability and fairness.

Still, we underline that for validation and for official recognition purposes, and if other entities, outside this consortium, wish to develop the validation and recognition process for this DTM qualification, other complementary assessment methods should be considered and used (as the examples of methods and tools presented before), not only the method supported on multiple choice tests.

4.2 The assessment methods

For each learning unit, defined in WP3, based on the needs identified in WP2 and the training materials developed in WP5, a multiple choice test will be available on the online course platform that will allow to assess the level of knowledge acquired by each participant in that same learning unit or training module.

Participants must take the multiple-choice tests for all the modules. Although the modules are organized in a way that respects the coherence of the training course, the participants will be able to define their learning path in the course in a flexible way, considering all their academic and professional experience. This means that it will be possible to personalize the training path, offering the possibility to enrol on the full course or just in the learning units, they are interested as specified in the D3.1 DTM curriculum document. In the case they are enrolled on the full course, to receive the DTM Certificate, they must pass all the tests related to all training units. If they are enrolled on the alternative reduced training path, as specified in D3.3 DTM curriculum document or in one specific learning unit, they must pass the test of that/those learning unit/s and they will receive a partial Certificate.

Based on these possibilities, the assessment process will be automatic and available on the online platform and will cover all the knowledge identify on the DTM learning outcomes units. This assessment process will be implemented and tested in the pilot course (WP7). Thereafter, a revision and improvement of the assessment methods and tools will be delivered.

The elaboration of multiple-choice tests, referring to each learning unit or training module, will be done based on the respective learning outcomes and on the 100 training pills developed in WP5. Considering the information available on WP3, about the learning units, and the learning pills that integrate each one of that learning unit, the assessment method based on multiple choice tests can be summarized as follows:

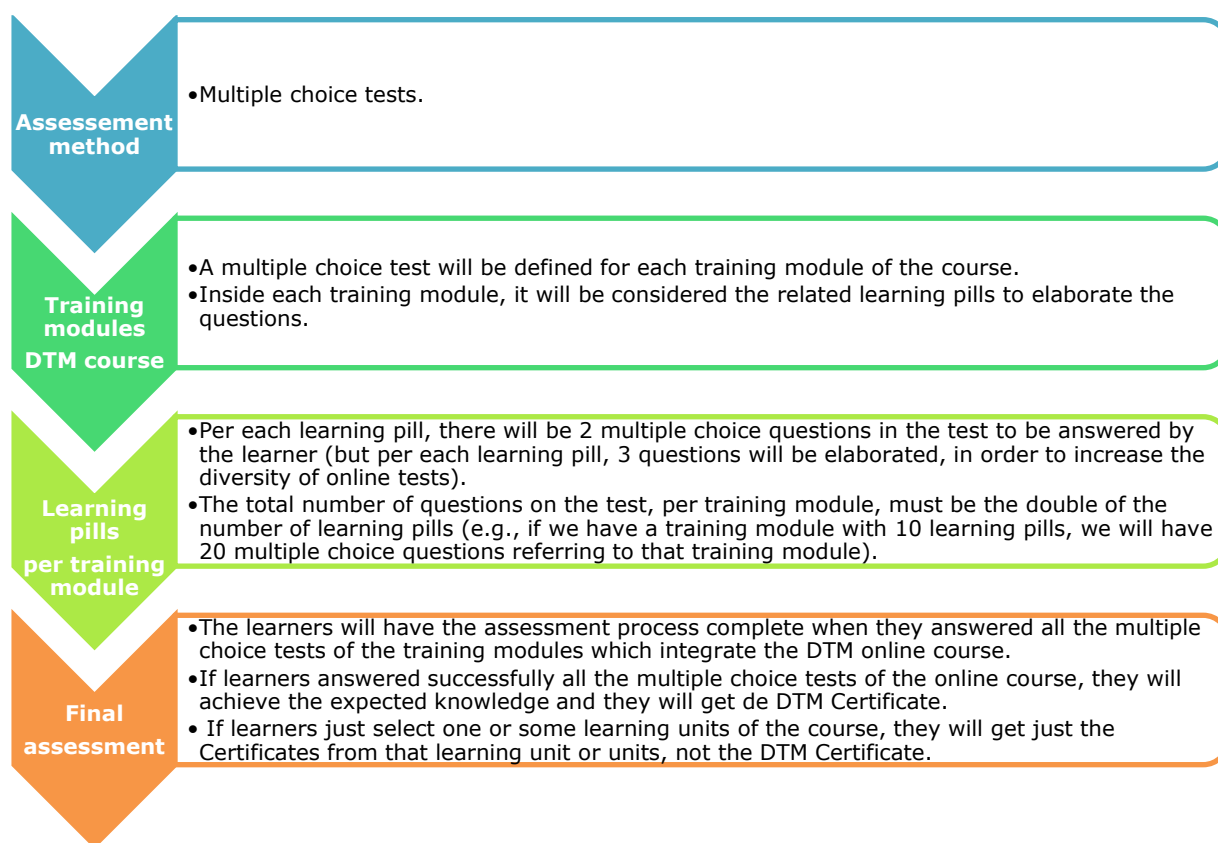


Figure 4 - Definition of the common assessment method for DTM online course.

4.2.1 Guidelines for multiple choice test questions

Considering the assessment method selected, it is important to underline that multiple choice test questions, also known as items, can be an effective and efficient way to assess learning outcomes. Multiple choice test items have several potential advantages¹¹, such as *versatility* (items can be written to assess various levels of learning outcomes, from basic recall to application, analysis, and evaluation), *reliability* (defined as the degree to which a test consistently measures a learning outcome) and *validity* (the degree to which a test measures the learning outcomes it purports to measure).

The key to taking advantage of these strengths, however, is the construction of good multiple-choice items.

A multiple-choice item consists of a problem, known as the stem, and a list of suggested solutions, known as alternatives. The alternatives consist of one correct or best alternative, which is the answer, and incorrect or inferior alternatives, known as distractors.

However, writing high quality questions that probe learners' deep understanding and tap onto the whole variation of learning outcomes among them does require lots of careful work and specific knowledge as follows:

- a) How to write the stems?

¹¹ Haladyna, Thomas M. Developing and validating multiple-choice test items, 2nd edition. Lawrence Erlbaum Associates, 1999.



- *The stem should be meaningful by itself and should present a definite problem. A stem that presents a definite problem allows a focus on the learning outcome;*
- *A stem should stand on its own such that, upon reading the question and viewing any visual information the learner should know the correct answer without reading the options (assuming the learner has mastered the content);*
- *A stem should be written as a positive expression; using negative words such as "except" or "not" creates confusion;*
- *A stem should avoid trick questions.*

b) How to design multiple choice questions?

- *Limit the number of options to four;*
- *Make sure there is only one acceptable answer;*
- *Make sure there is one best answer (refrain from using "all of the above" and "none of the above");*
- *Avoid using absolutes, such as "always" and "never";*
- *Keep the options approximately the same length so as not to give away the answer;*
- *Make sure the options are worded in a similar way;*
- *Make sure the grammar and syntax of both the question and the options are in agreement;*
- *Create distractors that are appealing and plausible;*
- *Make sure to vary your placement of the correct answer; avoid creating a pattern;*
- *The most commonly used answer in a multiple choice assessment is (C). When assembling a test, make sure to review the placement of the keyed responses to avoid using the same letter answer choice more frequently than others do.*

c) How to write distractors?

- *Make the distractors believable;*
- *Ensure that the distractors represent actual incorrect results you would expect learners to produce.*

4.3 The assessment criteria

The participants on the online course will be able to answer multiple choice tests at the end of each training module to assess if they acquire the expectable knowledge available



in the learning materials. The information regarding the test results will be available for learners to consult, as well as the criteria for reaching the final certification.

4.3.1. Multiple choice tests

To pass the multiple-choice tests, learners need to achieve, at least, 50% of correct answers. If learners failed on the first attempt, they will have more two attempts to do it successfully. The possibility of repeating can help make the process of taking the test more an educational activity rather than simply assessment to get the certificate.

Multiple choice test – grading system	
Conditions to pass the test	Result
$\geq 50\%$ correct answers	<i>Approved</i>
$\leq 50\%$ correct answers	<i>Not Approved</i>

Table 6 – Grading system for multiple choice tests.

To assess successfully the training module and learning outcomes, learners need to score at least 50% of correct answers. If learners score less than 50% of correct answers, they must repeat the multiple choice test under the terms referred to.

4.3.2. Results Assessment – DTM Certificate

As referred before, learning outcomes will be assessed, in the end of each training module, online and through multiple choice tests, against the defined criteria.

How do learners will get the Certificate?

The final Certificate will be available for learners after assessing all the learning outcomes defined for all the learning units, that is, after answering successfully all the multiple choice tests available in the end of every training modules.

To obtain the a total certification, a DTM Certificate, learners must pass all the multiple choice tests of all the training course, that means that learners need to have at least 50% of correct answers in all of them.

If learners selected just one or a limit number of learning units, they will be assessed just in that learning units, and if they pass the multiple choice tests, they will get the certificates from these learning units, this way, they will get a partial certificate with the identification of the learning units made successfully on the training course.



Assessment procedure for certification	
<i>Certificate of Digital Transformation Manager</i> (Total certification)	<i>Certificate</i> (e.g., Learning Unit A + Learning Unit B, or VET training path) (Partial certification)
<ul style="list-style-type: none"> ✓ All the multiple choice tests score more than 50% correct answers. ✓ All the learning outcomes from the training course were assessed and validated. ✓ Certificate can be issued validating the course participation and the qualification of DTM. ✓ The certificate must contain the identification of all the learning units of the training course. 	<ul style="list-style-type: none"> ✓ Learners selected only the learning units they were interested on, not all of them. ✓ The selected learning units were successfully assessed through the tests. ✓ Certificate can be issued validating the participation on the learning units of the training course. ✓ The certificate must contain only the identification of the learning units assessed and validated (one or some learning units). ✓ If learners failed all the attempts to pass, one or some learning units, they can always obtain a certificate with the identification of the validated learning units.

Table 7 - Assessment procedure for certification.

4.4 Final remarks on common assessment system

In addition to the assessment system defined for the learning outcomes of the training modules, there will be more 20 hours on the pilot course for the development of a final project. The rules and the assessment criteria for this work-based project will be defined in WP5.



5 Conclusion

Considering the foreseen objectives of this Alliance, partners agreed on specific assessment methods to confirm if learners have achieved the desired knowledge. These units of learning outcomes were created in WP3, based on WP2 and WP5, and used to carry out the procedure of assessing following a common terminology based on the EQF and on ECVET, considering the assumption that all forms of learning can be assessed in terms of learning outcomes.

Regarding the common terminology needed, most of the partners have already in their own countries developed and implemented the NQF, which also facilitates the development and implementation of the outputs and outcomes of this Alliance.

The common assessment system to be used on the learning outcomes validation is based on an automatic online assessment composed by multiple choice tests, available for learners in the end of all the learning units of the training course. Concerning this method, we emphasize that we are assessing knowledge and not competences.

It is also important to underline that learners have the possibility to personalize their training path according their own interests. It is possible to enrol all the course, assessing and validating all the learning units and get a final certificate on DTM (total certification in all the learning units), but it is also possible to enrol just one or some learning units and get on the final a certificate where it is identify the learning units achieved successful in the course (partial certification in one or some learning units).

The idea is, and considering the foreseen objectives, to adopt common assessing methodologies in all participating countries and based on these, assess the pilot course learners. Following the pilot course, a revision and sequent improvement of the assessment methodologies will be delivered.



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PROJECT CONSORTIUM

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