

O6. ECO-Train guide: How to prepare and use LOs-based modules for adult educators



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1. Introduction

The idea of Learning Outcomes was introduced in EU policy agenda in 2003. It was grounded on the activities related to learning outcomes that were organized at national level in various European countries in the 1980s and 1990s. Currently, the Learning Outcomes approach is a common European initiative operating on the basis of the European Qualification Framework tool. It also operates at national level as a fundamental line on which the national qualification frameworks are structured.

The Learning Outcomes state what a learner is expected to learn, know, be able to do or demonstrate when he/she has completed an educational process (a programme / training path / course / project). These statements focus on learners' learning rather than instructor teaching, and are usually expressed as knowledge, skills, and attitudes/values.

The impact of Learning Outcomes approach on individual learners, the labour market and the society as a whole is indisputable. Learning Outcomes writing and application influence not only the teaching and learning process but also the way education is oriented and its quality is guaranteed. The methods of teaching and learning (incl. the learning environment), the assessment practices, and the validation specifications are also influenced by the way the learning outcomes are written. At wider scale, the Learning Outcomes are the instrument that is used to define and write qualifications, formulate qualification standards, and determine qualification frameworks.

Within Europe, along both Bologna and Copenhagen processes, Learning Outcomes are considered as the meant to amalgamate the variety of education and training systems encouraging the cross points of the formal academic curricula and the VET programmes, and the full spectrum of educational and training sectors.

The purpose of this guide is to provide practical instructions on how to prepare and use Learning Outcomes-based modules for adult educators. It comprises definition, organization, implementation and evaluation of all necessary actions for structuring Learning Outcomes.

2. Developing Learning Outcomes - How to Write Learning Outcomes

2.1 Learning outcomes, learning objectives, and learning experience – the relation

Before writing Learning Outcomes, their distinct characteristics that make the difference with the Learning Objectives have to be clarified. The main differences between Learning Outcomes and Learning Objectives are presented in Table 1.

Table 1. Learning Outcomes vs. Learning Objectives

Criteria	Learning Outcome	Learning Objective
The goal	Integration of the learning content from the learner's perspective; addresses learner's expectations	Specification of the primary topics to be covered; addresses tutors' engagement
The focus	Learners' intellectual progress and skills development	Learning material intended to be covered during the learning process
The tendency	Treating learning material as means to achieve an end result	Treating learning material as an end result
The output	Transforms and advances student learning	Specifies teaching intentions

Learning objectives generally describe what a learning provider, programme, or educational institution aims to do.

Learning outcomes describe in observable and measurable terms what a learner is able to do as a result of completing a learning experience.

According to UNISCO, 2013 *Learning content is broadly defined as the topics, themes, beliefs, behaviors, concepts and facts, often grouped within each subject or learning area under knowledge, skills, values and attitudes, that are expected to be learned and form the basis of teaching and learning.*

The learning achievements of a learner are expressed as the understanding and applying the learning content in a way that is observable and measurable by the learning provider through predefined standards and means.

2.2 Preparatory actions on writing Learning Outcomes

Since well-formulated Learning Outcomes serve a means for assessment of the teaching and learning process efficiency, a preparatory work has to be done before formulating Learning Outcomes, related to the following main issues (Table 2):

Table 2. Preparative activities before writing Learning Outcomes.

Question	Answer
What is desired a learner to be able to do?	<ul style="list-style-type: none">– Upon formulation, focus on the learner behaviour;– Mind the rule that Learning Outcomes address the learner’s abilities to demonstrate rather than the tutor’s abilities to provide.
What a learner will be able to do after the learning experience?	<ul style="list-style-type: none">– Choose the suitable methods and tools for assessment to control the achievement of the formulated Learning Outcomes.

What are the ideal knowledge, skills, abilities that the learner should demonstrate?	– Search for good practices in the relevant subject area in terms of desired knowledge, skills, abilities.
How will the learner be able to demonstrate what he/she has learned	– Formulate robust criteria of performance respecting the subject specificity and that can be measured / observed. – Identify the strong and weak points in Learning Outcomes and formulate an area for improvement.
To what degree the formulated Learning Outcomes match or fit the ones of the training providing institution?	– Arrange an institutional reference.

2.3 Formulating learning outcomes

When writing learning Outcomes, they must be expressed in a way that reflects learner’s cognitive skills. For this purpose, use the 6 levels cognitive skills scale (lowest to highest) of the revised Bloom’s Taxonomy (Table 3).

Table 3. Revised Bloom’s Taxonomy cognitive skills scale.

Category	Definition	Learning Outcome level of complexity
Knowledge	– Remembering of previously learned material; recall of information	– The lowest level in the cognitive domain

Comprehension	– Understanding the meaning of material; demonstrating comprehension	– The lowest level of understanding
Application	– Ability to use learned material in new context;	– A higher than comprehension level of understanding
Analysis	– Ability to understand of the organizational structure of a learned material	– Require understanding of both the content and the form of the learned material
Synthesis	– Ability to combine or group knowledge to come to new conclusions	– Emphasis on creative behaviour
Evaluation	– Ability to judge on the learned material value	– Value judgments on pre-defined criteria

2.4 Choosing the verbs to describe Learning Outcomes

Making Learning Outcomes specific and measurable depends crucially on the use of active, measurable verbs for their description that demonstrate the abilities the learners should achieve, the tasks they are supposed to DO upon completion of their learning. Learning Outcomes must be described through statements that include a verb phrase + impact phrase; i.e., what a learner will be able to do + how he/she will be able to apply the acquired knowledge and skills.

The formulae to be used is:

He / She will be able to [action verb] & [something]

The revised Bloom’s Taxonomy of Educational Objectives specifies the sets of useful verbs that may be used to formulate learning Outcomes. They are allocated in different categories respecting the cognitive domains and the associated with them levels of learning. An exemplary, nonlimiting list of verbs is presented in Table 3, below.

Table 3. List of active verbs to be used for Learning Outcomes formulation.

Category	Verbs
Knowledge	arrange; cite; collect; define; describe; duplicate; enumerate; find; identify; locate; memorize; record; recognize; match; relate; select; name; label; list; order; quote; recall; repeat; reproduce; select; show; state
Comprehension	associate; classify; compare; contrast; convert; describe; estimate; explain; extend; generalize; give examples; identify; interpret; justify; locate; outline; paraphrase; predict; recognize; report; restate; review; select; summarize; trace; translate
Application	apply; calculate; chart; choose; classify; complete; compute; construct; contribute; develop; discover; dramatize; employ; experiment; extend; illustrate; implement; instruct; interpret; modify; operate; participate; practice; predict; show; solve; teach; text; use
Analysis	advertise; analyse; break down; categorize; classify; collect; compare; connect; contrast; correlate; criticize; diagram; differentiate; distinguish; divide; establish; explain; identify; illustrate; infer; investigate; order; outline; prioritize; question; select; separate; verify

Synthesis	adapt; anticipate; arrange; assemble; collect; combine; compile; construct; decide; design; develop; facilitate; formulate; generate; generalize; imagine; incorporate; individualize; integrate; invent; modify; negotiate; organize; plan; propose; rearrange; reconstruct; reorganize; revise; select; structure; substitute; validate
Evaluation	appraise; argue; assess; choose; conclude; convince; criticize; critique; debate; decide, defend; determine; discriminate; evaluate; grade; integrate; interpret; judge; justify; predict; prioritize; rate; recommend; reframe; score; select; support; value

2.5 Structuring Learning Outcomes

Learning Outcomes must sharpen the focus of the educational process on the learners' learning. They have to focus on learners' performance and products and clearly communicate the learning process expectations to the learners.

Learning Outcomes that specify an action by the learner must fit the following requirements:

- To be specific: with subject-specific Learning Outcomes it is easy to measure how well they have been met. The specific Learning Outcomes help tutors more carefully map the direction of the educational process they are leading.
- To be observable: state in a transparent way what a learner should be able to do at the end of training process that he/she is not able to do before the start of the process.
- To be measurable: the Learning Outcomes that are measurable should consider the learner learning behaviour, the relevant methods for assessment of his/her achievements, and the defined specific criteria for learner performance and success. Learning outcomes must be learner-focused rather than tutor-focused.

They are about what learners are able to demonstrate upon completion of a training process and not about what the tutor is able to provide. In this context, the Learning Outcomes designate those knowledge and skills that the learner will employ and that will be useful and appreciable in respect to his/her professional and personal realization. They should be measured by carefully selected assessment methods. Assessment methods are means and techniques that are used to measure the degree to which a certain learning Outcome is achieved. There is a great variety of quantitative and qualitative methods for assessment, direct or indirect. Direct assessments concerns participation of a selected group of learners through their work. The indirect one means gathering information through other non-direct means. Some of the most exploited direct and indirect techniques for assessment are summarize in the Table 4 below. In any case, it is important while writing learning outcomes to indicate the useful modes of assessment and their specific elements in an understandable by the learners' way. In this way, the learners will be well informed for the standards by which they will be assessed and empowered by the assessment stage of their learning. The assessment methods selected for assessment should be adequate to the knowledge, skills, competence to be determined. This approach allows assessment of Learning Outcomes in formal education (in compliance with national qualification systems' criteria) but also in cross-educational / cross-occupational context (e.g., during a stay abroad). To be workable, the assessment methods should be coupled with a set of desired performance criteria assigned to specific learning process and expressed in measurable/observable terms. For instance, for grading with a scoring rubric or through a standardized test, a threshold of about 60 – 65% % is a realistic one; for surveys – 80% demonstration of increased appreciation is another option.

Direct assessment methods	Indirect assessment methods
<ul style="list-style-type: none"> – Course /homework assignments – Exams 	<ul style="list-style-type: none"> – Course evaluations – Test blueprint

<ul style="list-style-type: none"> - Quizzes - Standardized tests - Papers and reports - Internship performance - Research projects - Discussion participation - Case study analysis - Written/oral presentations, and performances 	<ul style="list-style-type: none"> - Learner perception surveys - Exit interviews - Focus groups - Job placement
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- To be realistic and demonstratable: all learners have to be able to demonstrate their newly adopted knowledge and skills described through the Learning Outcomes upon training process completion. This means that the Learning Outcomes have to be the standard for the education process.
- To be focused on application and integration of the adopted knowledge and skills, emphasizing on the way the described knowledge and skills may be used by the learner, at present and in the future.
- To be flexible: although the Learning Outcomes have to be subject specific the tutors have to be able to upgrade, adjust or modify them along the educational process to better fit its goals.
- To be coupled by a timeline for accomplishment of a learning period.

Learning Outcomes are goal-oriented. As such, the good Learning Outcomes must be written applying SMART goal criteria of Management by Objectives approach to make this goal achievable (Table 4).

Table 4. SMART goal criteria for writing Learning Outcomes

SMART GOAL CRITERIA

Smart	SPECIFIC: <ul style="list-style-type: none">– Focused on a specific category of learning
sMart	MEASUREABLE / MANAGEABLE <ul style="list-style-type: none">– Must indicate how they will be assessed– Data can be collected to measure learner learning– Formulated in a way as to be understandable by all involved in the educational process
smArt	ACHIEVABLE / APPLICABLE <ul style="list-style-type: none">– Must be achievable given the educational experience– Must emphasize ways in which the learner will use the knowledge and skills gained
smArT	RELEVANT / REALISTIC / RESULTS ORIENTED <ul style="list-style-type: none">– Matters and aligns with other relevant Learning Outcomes– All learners completed a learning process should be able to demonstrate the knowledge & skills gained– Aligned with the Learning Outcomes of the education providing institution
smarT	TIME-BOUND / TAILORED / TRANSPARENT / TRANSFERABLE <ul style="list-style-type: none">– Deadline by which the knowledge and skills must be acquired– Specifically tailored to a subject content– Easily understood by the learners– Addressing knowledge and skills that can be used by the learner in different contexts

2.6 Description of Learning Outcomes

The description of Learning Outcomes demands a reference system. The European Qualification Framework (EQF), as a reference framework that makes qualifications better understandable and readable within various countries and systems is a good standpoint for the description.

Three elements should be considered while describing Learning Outcomes: **knowledge**, **skills** and **competence**. They can be reflected either in a holistic manner or as individual element. While using the holistic approach, the description of the Learning Outcomes is coherent, as a continuous text, without explicit differentiation of the three elements. If differentiation among knowledge, skills, and competence is adopted, a detailed description of the three elements unified in the form of a matrix is recommended. Both approaches have their advantages and disadvantages. The ‘matrix’ approach allows for better comparison and more comprehensive structure in respect to the assessment of the Learning Outcomes. However, this approach is overlapping-prone when many Learning Outcomes are described, especially their personal or social components. In addition, the splitting of the description of knowledge, skills, and competence may be somehow confusing, since competence is a term that encompasses the rest. On the other hand, the holistic approach offers better relationship between the three categories of competence.

2.7 Learning Outcomes areas of application

The use of Learning Outcomes is multi-layered and depends on the anticipated benefits they bring.

2.7.1 Learning Outcomes benefits to the learners

- Guidance on directing their learning process;
- Common language for description what they are learning and are able to know and do;
- Support for the initial choice of education/learning pathway;

- Means for articulating learned material from different learning processes;
- Source of information about the ongoing learning processes and expectations regarding assessment;
- Source of information where particular knowledge/skills are offered and can be learned;
- Tools for assessment the progress towards educational goals;
- Mapping available learning options throughout the educational setting.

2.7.2 Learning Outcomes benefits to the learning providers

- Means for articulating the learning goals they would like learners to achieve
- Tools for orienting teaching and selecting teaching methods; planning the assessments needed to determine if the goals have been met; directing and motivating learners, and supporting the learning process;
- Instruments to plan the activities, the amount of practice, and the materials learners will need to reach the learning goals.

2.7.3 Learning Outcomes benefits to the education and training institutions

- An instrument for better planning and dialog promoting;
- Means for facilitating the learning process;
- Means to receive feedback on the quality of the educational services provided against learners' satisfaction, the acquired skills, and the matching of the intended with the actual skills.

2.7.4 Learning Outcomes benefits to the labour market and the society

- A common transparent instrument through which different stakeholders in education and training, and the labour market are able to identify skills needs;
- An indicator for the quality and relevance of education and training, focused on the relationship between anticipated and really achieved Learning Outcomes;
- A reference point for the labour market to balance with the needs of the education and training system and its players: the teachers and the learners.

3. Composing Units of Learning Outcomes - Making Learning Pathways

Vocational Education and Training (VET) in its formal and other learning contexts, as a part of the lifelong learning, encompasses learning activities which goal is to improve knowledge, skills and competence within different perspectives related to personal life, society, labour market and employment. Adults also take part in VET programmes targeting up- and re-skilling.

At European level, the mutual trust and mobility in VET is promoted by the European Credit system for Vocational Education and Training, (ECVET) established and launched by EU Member States in 2009. Currently, ECVET is implemented in both mobility and national contexts as a tool for transfer and accumulation of Learning Outcomes. The Learning Outcomes-grounded VET approach is based on EQF system and a set of tools for describing Learning Outcomes, their assessment, documentation and validation of Units of learning Outcomes.

3.1 Units of learning Outcomes

The Unit of Learning Outcomes (or Learning Outcomes Unit) represents a defined component of a qualification. It comprises a logical set of knowledge, skills, and competence that can be assessed and validated. Being structured in a logical succession and in comprehensive way, the Units of Learning Outcomes are verifiable. As a part of a qualification, a Unit of Learning Outcomes can be assigned to one specific qualification or to several qualifications, as a common element.

3.2 Design of Units of learning Outcomes

The logic behind the design of Units of Learning Outcomes is to ensure interconnected and structured learning process with clear assessment approach and criteria. In this context, the Units of learning Outcomes should be:

- Designed in a way that guarantee independent completion (and assessment) in respect to other Units of learning Outcomes;
- Structured to encompass all the learning Outcomes that are needed (i.e., with both subject specific, and social, and personal competences);
- Structured to allow the Learning Outcomes to be achieved within a defined time-frame (e.g., during a stay abroad);
- Assessable, oriented towards occupational activities;
- Oriented towards minimum requirements for achieving Learning Outcomes composing a relevant Unit of learning Outcomes;
- A full set, in case a full qualification is described, that covers the entire qualification.

3.3 Presenting Units of learning Outcomes

The Units of Learning Outcomes presentation is based on descriptors depending on the specific aim and purpose they will be used for. Thus, along their description the following information should be considered (as recommended by ECVET):

Descriptor	Information
Name	The title of the Unit of Learning Outcomes
Qualification	The title of the qualification to which the Unit of Learning Outcomes relates.
EQF	The EQF level of the qualification (and, if applicable, the NQF level)
ECVET points	The ECVET points associated with the Unit of Learning Outcomes. They are determined in accordance with the relative value of the Unit of learning Outcomes measured on the basis of a qualification and are transferable.

Learning Outcomes	The learning outcomes contained in the Unit of Learning Outcomes
Assessment	The procedures and criteria for assessment of the Learning Outcomes contained in this Unit
Time-frame (where applicable)	The validity in time of the Unit of Learning Outcomes
Learning Content	List of the learning material components (modules/units/courses)

3.4 Assessment, validation and recognition of Units of learning Outcomes

The procedures of assessment, validation and recognition of the Units of learning Outcomes have to be conducting in compliance with the valid national practices and regulations. These procedures, to be performed in due quality have to respond to the following criteria for assurance of quality:

- For assessment – methods and processes for establishment of the extent to which the learner has attained knowledge, skills and competence have to be used.
- For validation – confirmation that certain assessed Units of Learning Outcomes gained by a learner correspond to specific Learning Outcomes required by a Unit of Learning Outcomes or qualification;
- For recognition – attestation of the officially achieved Learning Outcomes through awarding of Units of Learning Outcomes or qualification.

3.5 Structuring Learning Pathways

3.5.1 The Learning Pathways

The Learning Pathway is a rote that a learner chooses among various learning activities and that allows progressively accumulating knowledge. It is a selection of learning objects

linked within a structure for learners to advance and master a defined topic. The Learning Pathway is a mindful personal choice that a learner makes apart from any influence / control executed by the learning activities provider and deliverer. It gives learners freedom on their learning experience in a way that they can acquire and retain knowledge and skills more efficiently.

The Learning Pathway promotes effectivity of learning since the learner is mainstreamed to proficiency through a sequence of learning activities on selected study subjects in the shortest possible period.

In the context of learning as a continuous process rather than an isolated event, Learning Pathways enable both learners and learning providers to find new ways of education associated with improved results and reduced costs.

Learning pathways are assembled on the basis of personalization. The learner-centered approach that is used for their construction emphasizes on learner-specific goals, objectives and preferences. In this way, learner's needs and style of learning are taken into consideration while constructing Learning Pathways.

3.5.2 The process of structuring

The Learning Pathway is an approach to organize e-learning activities. Instead of launching traditional study programme based on the “one size-fits-all” approach where all learners have access to one and the same learning content in a linear manner, this is an approach that organizes the learning content in a flexible and customized way offering package of different possible learning objects out of a common pool available.

The procedure of constructing Learning Pathways include consequent considerations, as follows.:

- Put overall learning goals: a thorough analysis has to be performed to identify learning priorities and specify Learning Pathway objectives as an integral part of the learning experience. To shape an individual plan, both the essentials of the learning content, and the needs and former experience on the key subject topics of

the learner have to be minded. Thus, the Learning pathway must offer opportunities to build on prior knowledge and enabling the learners to connect the content to reasons and final targets.

- Make learners feel empowered: offer options to learners how to receive a learning content, the way of (online) assessment, and a choice of upcoming activities. Build a sense of importance in the learning process without telling learners what and they are going to learn.
- Stress upon online assessment: online self-assessment for the learners has to be offered that enables learners to test their progress in knowledge comprehension. It is important to consider the option for correcting wrong answers and have access to the right information. Focus on the awareness that the learning providers are active and offer support.
- Prepare benchmarks: arrange options for the learners to check their advancement along the Learning Pathway and offer them better control on the learning process – arrange sets of mandatory and optional activities. Integrate the practical assignments into the learning process.
- Offer various styles of learning material delivery: integrate different online activities to offer learners a real choice of what suits them best and blend teaching/learning approaches (virtual lectures or podcasts to auditory learners; e-learning videos and image-rich content to visual learners; text-based materials for those who prefer to read etc.).
- Ensure feedback: implement a form of tracking and feedback that is quick enough not to allow the learners to memorize incorrect information or follow disapproving learning behaviours but to learn from their mistakes. Arrange a mechanism for processing the feedback to extract valuable information about the effectiveness of the Learning Pathway offered.

From technical point of view the Learning Pathways' designers have also to follow an algorithm that guarantees the online support of the learning activities. Namely, it is:

- Assign and distribute learning objects across the various Learning Pathways. Since in e-form the knowledge content is quite dynamic, think of options for easy incorporation of new learning objects in the Learning pathways to allow learners to access and learn a specific piece of knowledge or specific skill.
- Arrange links between different activities and create benchmarks. Make the connections between the various activities apparent for the learner.
- Formulate an understandable learning goal. Since the learning pathway is composed by learning objectives to be reached, each objective has to represent a distinct learning material that the learner has to take.
- Make a visual representation of the Learning Pathway. Arrange posts that keep the learner focused on the final target and facilitate his/her orientation about the progress made and the efforts foreseen towards finalization of the learning process.

3.6 The main characteristics of the Learning Pathways

- The learner-centered concept: the learners have the freedom to start choose where and when to start a Learning Pathway. This control increases their learning options since learners choose a learning scenario that best fits their experience level and abilities. The Learning pathways provide the learner with a space where they can track progress towards learning goals and move toward identified learning objectives. The learners feel empowered to choose learning goals, adapt them if needed and earn recognition along the path.
- The multi-disciplinarity and flexibility: allow learners to gain competence in more than one area
- The holistic and increasingly complex structure: the Learning Pathways bring learner along from beginner to expert encompassing full set of learning objects foreseen to fit this route.

- The benefits for the learning providers: the Learning Pathways allow professionals to get better acquainted with their audience and reflect this knowledge in better design of the educational routes. Applying the analytics and tracking options offered by the e-learning management systems, the learning providers can estimate the most preferred online activities, the progression rate of the learners, the preferred way for feedback information delivery, all helping to improve learning strategies and support learning advancement.

3.7 The rationale behind choosing a Learning Pathway

The learner has to follow a procedure that guarantee he/she has made the right choice. Commonly, this procedure includes steps to:

- Identify priorities: the learners have to know their current state of knowledge and abilities and be aware of the emerging demands of a defined subject area. In addition, they have to reflect their abilities, space for improvement, and responsibilities in this subject area. They have also to assess their learning priorities.
- Choose of competence to develop: the learners have to search for competence(s) that best match their learning priorities in a particular learning area and review the knowledge, skills, and abilities that comprise this competence. Finally, they have to map the desired competences on their learning pathway.
- Compose the learning pathway: the learners have to pull together the learning activities for each competence selected, state the Units of Learning Outcomes, and select what learning content to follow to achieve these Units.
- Set the timeline and deadline: the learners have to specify and timeline and deadline to complete their Learning Pathway. This will help them to better plan and integrate the learning process within their other activities (e.g., other study commitments, work responsibilities, etc.).

3.8 Why are Learning Pathways beneficial?

The Learning Pathways are a powerful tool for learning, training, retraining. They allow a learner to make important learning decisions about why, where, when and how to learn. Also, what a learner wants to achieve and how the learning process will affect the current situation.

The Learning Pathways correspond to the needs for ongoing learning and skills development, each time a learner is supposed to stop and restart career or change career; when the job, occupation or career goals are changed or the learning activities demand accommodation to the current commitments.

The Learning Pathways help to accomplish progression in achieving current job, occupation or career goals. They allow learners to choose the best way of learning delivery and satisfy the preferable ways of learning, and to upgrade prior learning for recognition of a part or full qualification.

3.9 The Learning Pathways and current reality

One of the big challenges for the educational systems is to respond to societal / economic changes.

The modern Industrial Revolution 4.0 is transforming the educational needs; they are getting more technology- and industry-specific, dependent on the ISCO/job profiles. Adapting and responding to these new needs, Education 4.0 will be applied that align human to technology and offer competence-oriented learning process and Industry 4.0-oriented skills to gain these competences. The personalized Learning Pathways are a flexible tool to adapt and respond to the above-mentioned changes since they are better placed to respond to the new demands of the Industry 4.0 for technical, contextual, and transversal skills proficiency.

In the current Covid 19 pandemic reality this challenge is bigger than ever. The need for flexible learner-oriented educational offers that can operate in remote mode has strongly emerged since 2020. Exploiting the capacity of e-learning to conduct learning and teaching, and training for up- and re-skilling is intensively focused on the flexibility offered by the schemes, based on Units of Learning Outcomes. The Learning Pathways grounded on learner-centered approach offer that customized education that overcomes the majority of the obstacles associated with the negative Corona 19 pandemics impact on education.

4. Testing and feedback – the assessment principles

Assessment principles postulate that assessments must be:

- Valid - consistent with the tasks and standards of the cognitive area;
- Reliable – to comply with the corresponding assessment guidelines and defined qualification level;
- Flexible – apply a holistic approach that unifies knowledge and skills with their practical application;
- Fair – appropriate to the certain learning process.

For planning and conducting an assessment activity, a procedure that encompass several consequent steps have to be considered.

- **STEP 1: Selecting assessment methods.** Assessment methods are the means of collecting the evidence required to demonstrate satisfactory performance. In identifying the assessment methods, resources and facilities required for the assessment should be also considered. The variety of assessment methods includes approaches like direct observation, different types of questioning (self-assessment, interviews, written quizzes, etc.), Structured activities (case studies, simulations, practical demonstrations), portfolio, third party feedback and much more.

- STEP 2. Choosing the evidence. Evidence is the information gathered which, when matched with the requirements of the competency, provides proof of competence. Evidence can be of different formats and gathered from various sources. They are either direct (e.g. oral questioning or demonstration of acquired skills) or indirect (assessment of a final product or review of work undertaken).
- STEP 3. Choosing the assessment tools. These are the means for collecting and analysing evidence. Usually this is an instruction document that presents the ways for gathering and interpreting evidence, and the instruments to do so.
- STEP 4. Outline the criteria for reasonable adjustment considering factors as special needs, language difficulties, cultural background.
- STEP 5. Ensuring the truthfulness of the assessment decision. The assessment procedure and the relevant evidence have to fit to allow confidence in the assessment decision.
- STEP 6. Conduct the assessment.
- STEP 7. Record and report results, and provide feedback.
- Review the assessment.

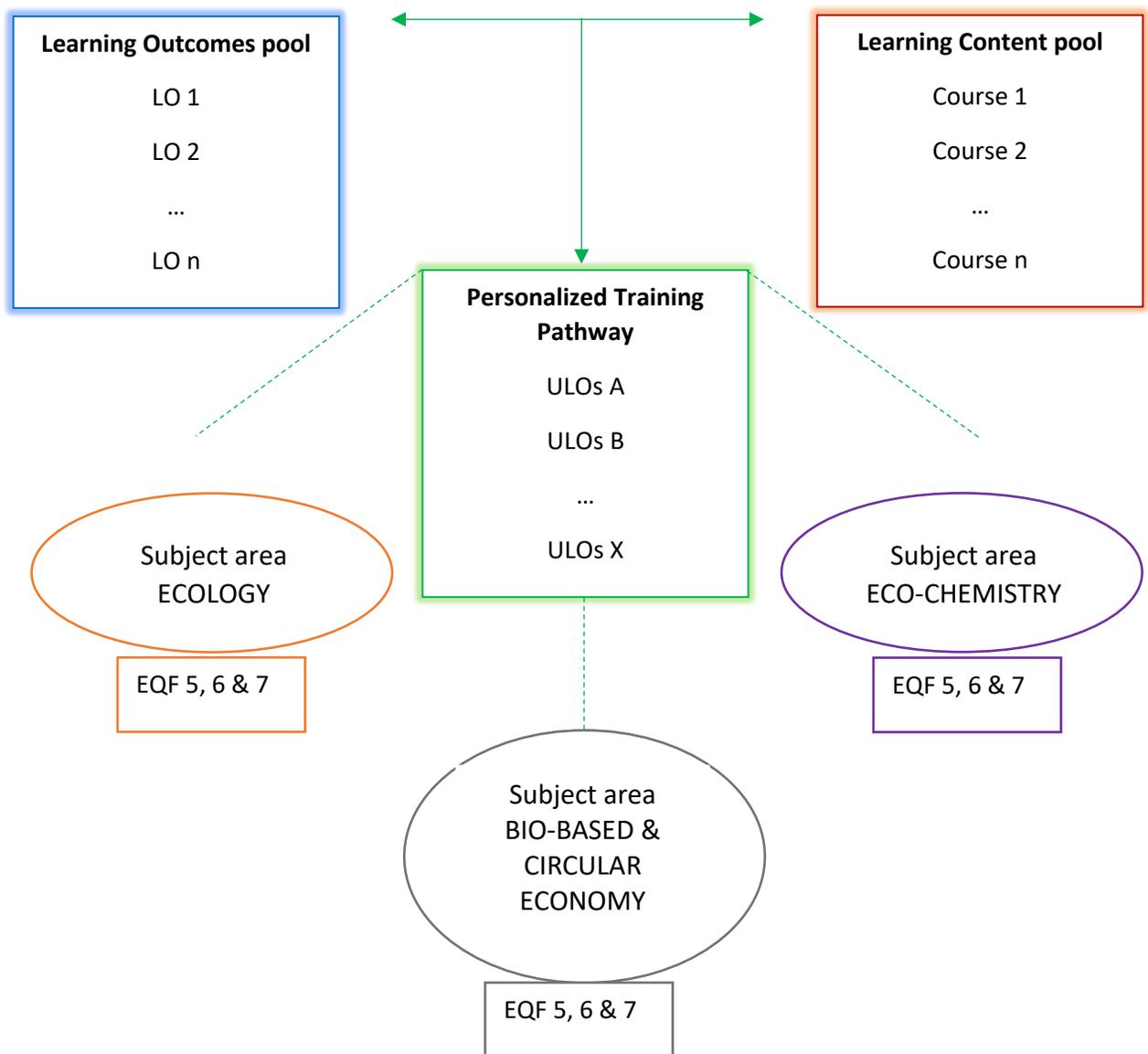
5. ECO-Train LOs-based e-training scheme for adult educators

The main principle of design, organization, delivery, and assessment of Learning Outcomes implementing European Qualification Framework (EQF) descriptors theoretical have been implemented in ECO-Train ICT-based training scheme – a model for organization and functioning of a training process that promotes learning opportunities for adult learning providers.

The model is developed on the basis of the subject area Eco-friendly technologies. It is constructed as a tool to facilitate adult educators learning that reflects:

- Their prior knowledge and skills, corresponding to EQF level 5, level 6 and 7;
- Their responsibility and autonomy as science teachers of adults;
- The new/upgraded competences (knowledge and skills) in three subject areas: Ecology, Eco-chemistry and Bio-based & circular economy.

Through the LO-based approach, the learners' prior knowledge and skills, autonomy and responsibility are upgraded with new competences in defined subject area through personalized Training Pathways that match individual needs.



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7. Annex 1. Learning Outcomes Reference Checklists

Tick the relevant option!

QUESTION	YES	NO
Does the Learning Outcome correspond to the Course / Learning Pathway / Programme educational goals?	<input type="checkbox"/>	<input type="checkbox"/>
Does the Learning Outcome describe what the learner is supposed to:		
– Know (cognitive ability)	<input type="checkbox"/>	<input type="checkbox"/>
– Think (affective ability)	<input type="checkbox"/>	<input type="checkbox"/>
– Do (performance ability)	<input type="checkbox"/>	<input type="checkbox"/>
Is the learning Outcome:		
– Meaningful	<input type="checkbox"/>	<input type="checkbox"/>
– Useful	<input type="checkbox"/>	<input type="checkbox"/>
– Valuable	<input type="checkbox"/>	<input type="checkbox"/>
Is the learning Outcome:		
– Subject specific	<input type="checkbox"/>	<input type="checkbox"/>
– Measurable	<input type="checkbox"/>	<input type="checkbox"/>
– Observable	<input type="checkbox"/>	<input type="checkbox"/>
– Identifiable	<input type="checkbox"/>	<input type="checkbox"/>
– Flexible	<input type="checkbox"/>	<input type="checkbox"/>
– Resulted from a learning process	<input type="checkbox"/>	<input type="checkbox"/>
Can you create an activity to make the learners learn the desired Learning Outcome?	<input type="checkbox"/>	<input type="checkbox"/>

Can you use the Learning Outcomes as a stand point to improve the learning process / content?	<input type="checkbox"/>	<input type="checkbox"/>
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