



WELDONE

BOOSTING INNOVATION IN WELDING TRAINING

Proj. nr. 2019-1-HR01-KA202-06-0814

Intellectual Output 1

ToT Curriculum



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Foreword

WELDONE ToT Curriculum is the first Intellectual Output (IO) of **WELDONE – Boosting innovation in welding training**, an Erasmus+ funded project implemented between September 2019 and May 2022. WELDONE consortium is comprised of seven partners from six countries (Belgium, Croatia, Greece, Hungary, Portugal and Romania), with recognized experience in Vocational Education and Training (VET) and Adult Training in the Welding sector.

WELDONE project focuses on the need for teachers and trainers belonging to member organizations from the European Federation for Welding, Joining and Cutting (EFW) in particular, and educators from Science, Technology, Engineering and Mathematics (STEM) fields in general, to acquire new pedagogical approaches and methodologies that can be used to look at competences in an holistic way, taking in consideration learners' ability to apply knowledge and skills when performing a task, thus moving into a competence oriented approach.

The main purposes of WELDONE project are to:

- Promote an uptake of an active learning approach by the EWF Education System and technical training in general,
- Promote the use of alternative pedagogical approaches by technical trainers and teachers (e.g., use of digital resources, problem-based learning and other innovative approaches),
- Challenge educators from the STEM fields to embed in their own educational resources the development of key competences in trainees,
- Foster an entrepreneurial spirit in European citizens able to research, select, analyze, organize and present information,
- Improve the provision of higher VET, increasing the attractiveness and relevance of VET.

WELDONE ToT (Training of Trainers) Curriculum sets the basis for the implementation of all materials developed in the scope of WELDONE project to achieve those purposes. It contains an inventory of activities connected to the design, organization and programming of teaching and training, including the definition of Learning Outcomes (LOs) for each Competence Unit (CU) part of this Curriculum, contents, teaching and assessment strategies/methods and materials.

Glossary of Terms and Abbreviations

The following Glossary was developed to help readers understand all the terms, references and abbreviations used throughout WELDONE ToT Curriculum.

Table 1 Glossary of Terms and Abbreviations used on ToT Curriculum Guideline

Term/Abbreviation	Meaning
Assessment	<i>Process of appraising knowledge, know-how, skills and/or of learning outcomes competences of an individual against predefined criteria (learning expectations, measurement of learning outcomes).¹</i>
CU(s)	Competence Unit(s)
EC	European Commission
EQF	European Qualifications Framework
Evaluation	<i>Judgment on the value of an intervention, training programme or policy with reference to criteria and standards (such as its relevance or efficiency).²</i>
EWf	European Federation for Welding, Joining and Cutting
IO	Intellectual Output
Learner(s)	Student(s) of the Teacher(s), Trainer(s) and Educator(s) who are the target groups and participants of the ToT Course
Learning Outcome (LO)	<i>Set of knowledge, skills and/or competences an individual has acquired and/or is able to demonstrate after completion of a learning process, either formal, non-formal or informal. Statements of what a learner knows, understands and is able to do on completion of a learning process, which are defined in terms of knowledge, skills and competence.³</i>
STEM	Science, Technology, Engineering and Mathematics
ToT	Training of Trainers
Trainer(s)	Person implementing the ToT Course
Trainee(s)	Teacher(s), Trainer(s) and Educator(s) who are the target groups and participants of the ToT Course
Workload (WL)	An estimation of the time learners typically needs to achieve the defined Learning Outcomes. WL covers theoretical training and self-study, as well as the time devoted to practical training and examination.

¹ Source: Cedefop (2014). *Terminology of European education and Training Policy. Second Edition. A selection of 130 key terms.* Luxembourg: Publications office of the European Union

² Source: Cedefop Glossary, retrieved from <https://europass.cedefop.europa.eu/education-and-training-glossary/e> on November 2019

³ Source: Cedefop (2014). *Terminology of European education and Training Policy. Second Edition. A selection of 130 key terms.* Luxembourg: Publications office of the European Union

1. Introduction

To inspire their learners on being creative and entrepreneurs, teachers and trainers themselves need to be creative and have an entrepreneurial attitude. They need to be flexible in framing various pedagogical strategies and be able to adapt to different themes/subjects to promote an open learning environment where creativity and risk-taking are encouraged and mistakes are regarded as learning opportunities.

WELDONE ToT (Train of Trainers) Curriculum (IO1) addresses all these aspects by providing a curriculum for the continuous professional development of teachers and trainers from EWF Qualification System in particular, and STEM educators in general – main target groups of the project.

Through a set of Competence Units (CUs) written in terms of Learning Outcomes (LOs) (i.e. statements that help clarifying the intentions of the CUs, orienting teaching and training and influencing the quality of relevance of the Curriculum), WELDONE ToT Curriculum capacitates them to apply WELDONE pedagogical approaches and methodologies to their training and teaching activities, maximizing the use of digital tools and environments currently available that promote a competence-oriented education, thus fostering the development of basic skills and key competences that will make the difference for their learners' success when it comes to the real performance at a job.

This Curriculum allows education leaders and teaching staff to deliver technical training in a WELDONE way, i.e., using alternative pedagogical approaches and embedding key competences' development in technical subjects' training.

To do so, it uses as reference the revised European Reference Framework of Key Competences for Lifelong Learning ([EC, 2018](#)), which details eight different competences. The CUs that compose this Curriculum (detailed on **section 3 Competence Matrices** and **section 4 Competence Units | Contents** of this document) address three specific key competences from this Framework:

- Digital Competence,
- Personal, social and learning to learn competence,
- Entrepreneurship competence.

The ToT Curriculum promotes the use of open and active methodological approaches by teachers and trainers focused on the educational process, stimulating research and critical thinking, cooperative and investigative learning processes in the promotion of knowledge, involving learners and teachers/trainers in the educational process.

Teachers and trainers should be prepared to introduce innovative pedagogical approaches to increase learners' motivation and interest by assuming the role of resources for the work of learners and mediators of the groups of learners, accompanying, guiding and solving possible problems in their learning paths.

The Workshop Model is one example of open and active methodological approaches that can be used in training and, as such, it is addressed in this Curriculum on **section 2 Implementation | Workshop Model** for the implementation of the ToT Curriculum to teachers and trainers from

the EWF Qualification System and educators from STEM fields, a strategy they can use with their own learners in the future.

Innovative pedagogic approaches such as the ones provided by WELDONE ToT Curriculum bring challenges to teachers' and trainers' daily work with learners and to the assessment of their achievements. To help them with this task, **section 5 Recommendations for Assessment & Evaluation** of this ToT Curriculum proposes an assessment framework adjusted to the training and teaching practices proposed by WELDONE.

WELDONE ToT Curriculum will enable teachers and trainers from EWF Qualification System and STEM educators to develop critical analysis skills that will enable them to explore the potentialities and limitations of using the pedagogical approaches suggested by the project and to deliver their training in a WELDONE way.

2. Implementation | Workshop Model

The Workshop Model is a framework that supports teachers and trainers in motivating their learners to take charge of their own learning process, becoming active and engaged in their work and development of understanding. This model can be used for the implementation of the ToT Curriculum and, as such, this section provides a general guideline that describes the main components of an effective workshop that “Minimizes Lecture, Maximizes Learning”.

Thus, this section is written for trainers implementing the ToT Curriculum/Course with target trainees (i.e., teachers and trainers from EWF Qualification System and STEM educators), who will then be able to apply what they will learn with their own learners.

The model’s framework is developed in a way that also considers the European Qualifications Frameworks (EQF) descriptors. This section describes an easy-to-follow four step method that can be used in different education and training systems for trainees.

The model helps to organize and schedule teachable core skills and knowledge described in the Learning Outcomes (LOs) of the Competence Units (CUs) that are part of the ToT Curriculum. Trainers are encouraged to provide and edit CUs’ contents in smaller units, suitable for focused **sessions**. The LOs are the starting points that each session can be built upon.

The Workshop Model can be used for science, technological, engineering and mathematical competence, digital competence, personal, social and learning competence, entrepreneurship competence, key competences addressed by WELDONE pedagogical approach.

It consists of sessions, each of which implemented in a process comprised of four elements: Opening (I), Mini lesson (II), Work time (III) and Debriefing (IV). It is supplemented with extra topics such as Preparation and Helpful Hints, as described as follows.

2.1 Relation with Kolb's Experiential Learning Cycle

The Workshop Model's steps are part of an experiential learning cycle⁴ mapped on Kolb's experiential model comprised of Experience – Reflection – Conceptualisation – Test.

This dynamic is demonstrated in the following figure:

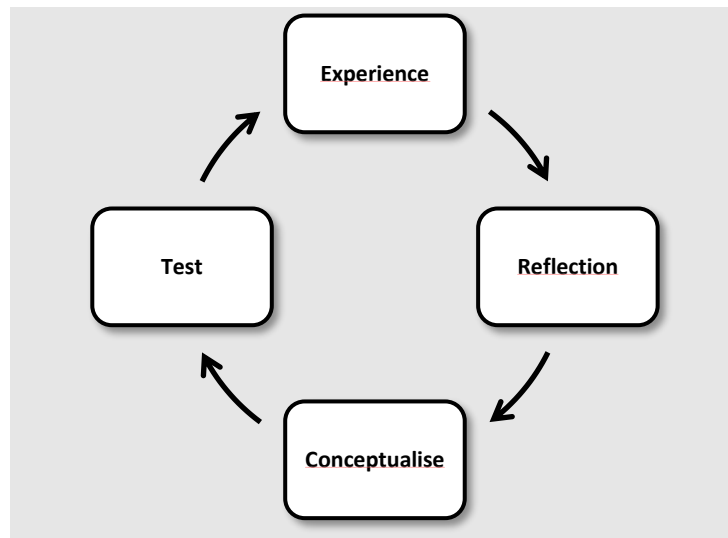


Figure 1 Kolb's Experiential Learning Cycle

On Kolb's Experiential Learning Cycle, trainees take part of the learning **experience**, an activity that gives them experience on the topic. After the experience, they are encouraged to objectively **reflect** on it *without assessing or evaluating* their performance. Only after reflection is done, they are asked to assess and evaluate the learning experience, which will enable them to develop **concepts** for themselves on how to internalize the key learnings. Most of the time, these concepts are translated into simple rules.

After the third phase – Conceptualisation - they will be able to **test** their rules or concepts. The test phase contains a new activity that can even bring new experiences, but on a greater level. Thus, the four steps can be arranged in a growing learning spiral where steps are repeated, again and again. In this model, the trainer is an initiator instead of the master of the group.

2.2 The Workshop Model

As previously mentioned, the Workshop Model consists of four different, but interconnected, elements: Opening (I), Mini lesson (II), Work time (III) and Debriefing (IV).

Comparing with Kolb's Experiential Learning Cycle, the *Experience* phase is implemented as the "Opening", "Mini lesson" and "Worktime" elements of the Workshop Model. These three elements cannot stand alone. "Worktime" is a pure and subjective experience that requires an

⁴ Source: Kolb, D.A (2015) *Experiential Learning Experience as the Source of Learning and Development*, retrieved from https://www.researchgate.net/publication/235701029_Experiential_Learning_Experience_As_The_Source_Of_Learning_And_Development, on April 2022

introductory “Mini Lesson”. The “Mini Lesson” needs the “Opening” and the three form a consistent unit.

Reflection and *Conceptualisation* parts of Kolb's Experiential Learning Cycle are related to the "Debriefing" phase of the Workshop Model, and the *Test* part is a new experience in a new session or an assessment". The figure below illustrates this comparison between the Experiential Learning Cycle and the elements of the Workshop Model:

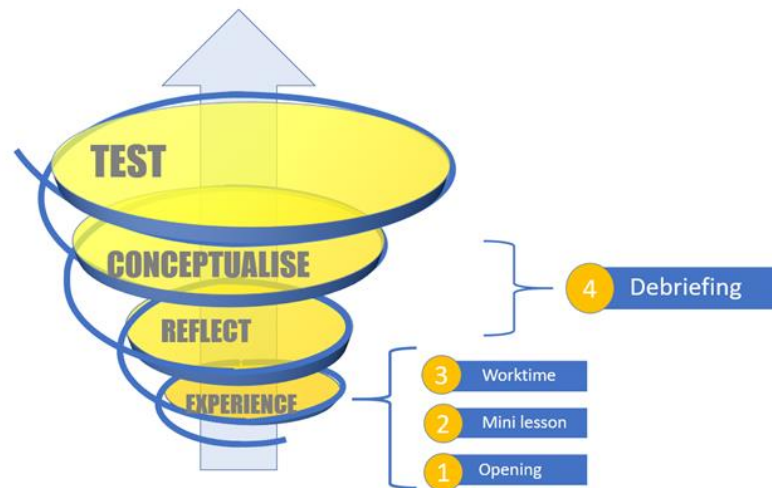


Figure 2 Workshop Model arranged along with the Experiential Learning Cycle

2.2.1. Implementing the ToT Curriculum

To implement the ToT Curriculum using the Workshop Model, there are specific steps to consider ensuring it is successful:

Preparation

The Workshop Model is a “step by step” method with a given time frame, which is usually tight. This requires a good preparation, which is key to achieve good results in this model.

At the developing stage of the ToT Curriculum, WELDONE partners defined specific Learning Outcomes (or LOs) for each CU using Competence Matrices, and a set of resources (exercises and assessment tools) was developed to be used for the implementation of the ToT course through the Workshop Model.

Preparation will lead to smooth transitions between all four steps of the workshop model.

Definition of Learning Outcomes for each session

Learning outcomes are statements defined in terms of knowledge and skills, indicating what trainees will be able to do, know, understand and demonstrate by the end of a learning process.

On section 3 **Competence M** of this document, specific LOs are defined for each Competence Unit of the ToT Curriculum. As such, when preparing the workshop sessions, trainers can identify which LOs are to be addressed and achieved by trainees at the end of each session. By setting specific LOs for each session, the trainer is also able to plan the necessary activities using the resources prepared in WELDONE to ensure those LOs are achieved.

WELDONE Toolkit

Use WELDONE [toolkit](#) or even build a repository of your own! This repository consists of teaching methods, practices and activities. The toolkit includes practical resources focused on the development of the specific key competences proposed by the project to be embedded in technical training: science, technological, engineering and mathematical competence, digital competence, personal, social and learning competences, and entrepreneurship competence.

Details about the different steps of the Workshop Model are provided below.

2.2.2. Step one: Opening

The Opening part of a workshop session has several important purposes - breaking the ice, raising enthusiasm and focusing on the key learnings.

In the Opening part, the trainer clearly sets the objectives of the whole session in terms of what trainees should be able to know or do by the end of the session. The trainer may explain the schedule and the rules of the session and can throw in several opening tricks such as ice breakers, warm-ups, that energise trainees. The trainer should be expert at assigning tasks to the group.

It is crucial to answer the “why” question early in the workshop. By explaining to trainees, the importance and relevance of the activities of the session, trainers can keep motivation high in the group.

It is no longer “I need to do this because they told me to”. For example, the trainer may say to the group, “We are going to revise a plan made by former trainees because we can learn from their mistakes. We can prevent many problems in our own job by analysing this plan. As you are reading today, I want you to notice the mistakes they did. Then, I want you to explain how these mistakes have helped you in your progress.”

If trainees understand the reasons behind what they are asked to do, they will have a new sense of motivation.

2.2.2. Step two: Mini lesson

Mini lessons are short instructional or demonstrational periods during which trainers can explain and model a strategy that they want trainees to immediately apply or use. Mini lessons should last about 10 minutes and include discussion between them.

Trainers must be able to explicitly model their material and provide trainees the opportunity to discuss how they can apply it before they go with it into the work session. They are well tailored materials that describe an activity or a process or illustrate a model.

Tips for Trainers How to keep Mini Lessons mini?
<ol style="list-style-type: none"> 1. Narrow your focus. You cannot eat the big fish at once. Find just one angle you want to focus on that session. 2. Set up your flipcharts or PPTs in advance. You can save an easy five minutes with prewritten charts or slides. Trainees do not need to see you writing the mini lesson statement or the first example on the chart. 3. Have special folders or bins for handouts or notebooks. There are always trainees who can't find their notes. You save time with creating a special place for the notebooks to be stored outside the workshop time. This way, trainees can quickly grab the materials they need, and they can put them away at the end. 4. Create your trainees' questions in advance and write them down. Sometimes we lose focus of our own narrowed statement. Plan specific questions that may occur to your trainees in advance. By doing that, you can easily stay on topic. 5. Have all your mentor materials available. A mentor material is any book, object, picture you have already shown to the class that you plan to use as an example to teach the targeted skill. 6. Take the time for management and routine lessons. Smooth transitions will not go without practicing.

2.2.3. Step three: Work Time

Work time is the active part of the workshop where trainees learn by doing. In work time, trainees work while trainers actively watch, listen and take notes that could be used as feedback in the reflection (debriefing) phase. Sometimes trainers can work with one or two trainees while the others work. The right method depends on various factors such as special personal needs or tempo, the characteristic of the learning outcome, the type of the skill.

Work time formats can vary depending on the class, the grade level, the schedule, and the needs of the trainees. Here are some basic formats:

1. Trainees work individually, then they do a short assessment alone on what they have done.
2. Trainees can work independently, then they form subgroups or pairs to share what they have learnt.
3. They can work on a common task together. If so, the trainer should be specific on the degree of freedom provided to trainees and present the task as a set of "to-dos" or, alternatively, give specific roles and rules to trainees.

For example, if the trainer assumes that the trainees are capable to organize themselves into an effective problem-solving group, the trainer may say "Now you have read how to install it. In the next 40 minutes you are going to do it as a group, you choose your roles. You are responsible for your timing too."

If the cooperation level is not so high, then the trainer may say "... We will split up the next 40 minutes into 10 minutes blocks, here you can see what to do in the first ten minutes, the second ten minutes in the installation process, and so on. Who wants to be the time controller of the group? Who will be the mechanics? "

4. In the first round, trainees form subgroups to work on a part of the material allocated to them. Then, in the next round, each subgroup demonstrates what they have worked on to the other groups.
5. In the first round, trainees form subgroups to create an assessment test on a part of the material allocated to them. Then, in the next round, they put together the test parts. In the third round they take the assessment test individually and on the fourth round they share their learnings.
6. The trainer designs a game (table format, decision tree format, room escape format, virtual reality, even a scavenger hunt format or whatever else that might fit to the topic), and the trainees go through the game individually or in groups.

2.3.3. Step four: Debriefing

Debriefing should last about 10 – 15 minutes, depending on the topic or the trainees needs.

Debriefings may vary depending on the topic or on the group. However, there are common rules of debriefing. The most important rule is objectivity.

Giving feedback in an objective way can be described with an example from sniper trainings. A trainer really does not help the shooter with feedback like this: “Hey, you’ve only shot 3 points altogether, and it isn’t too nice!”. This feedback is personal, emotional, raise feelings of guilt or shame. They are negative motivators.

Objective feedback must sound like this: “Your first shot went 2 cm above and half cm right from the centre. Then I saw you changing positions and the next two shots missed the board”.

This an example of the kind of descriptive feedback that must be provided, helping trainees to adjust their movements to achieve a better performance.

There is another aspect to highlight. Trainers’ objectivity differs from scientific objectivity. The reflection phase in the Kolb’s Experiential Learning Cycle should act like a special mirror. The trainer needs to decide how the trainees investigate it. In the previous example, our shooter has the freedom to accept the suggested connections between his action (i.e., “I saw you changing positions”) and the result (the next two shots missed the board). In this feedback, the trainer did not make strict statement with a “cause and effect” manner - just suggested a possible connection instead.

Last rule: Trainers should represent partnership as much as possible. Trainers help the trainees; they do not direct them. The trainees’ achievement is their own.

Debriefing can also include:

Sharing: In Sharing, trainees share they conclusions in pairs or in subgroups.

Presentation: In Presentation, trainees do a plenary session in which they present their key findings in front of the others. People do not want to look silly in front of peers, so presentation and share are very powerful tools on their own to bring dominance games⁵ down. If possible,

⁵ Some people often speaking too long or too loudly, or interrupt or distract to get attention of the others or to have control over the team or the teamwork process itself. These attempts

each trainee should do a short – one minute – presentation. It may sound impossible, but after a few presentations it turns to be a routine. (Do not forget, mini lessons have narrowly focused topics.) If there is no time for individual presentation, trainees can present in pairs.

Narrative: This format begins with a narrative reflection. The trainer briefly describes what happened in chronological order. After that, trainees are asked to tell what they want to keep and memorize from the previous activity. Then, the trainers ask them to say or write down what would they change to achieve better results. This format is useful in developing manual skills, task management or teamwork and helps to grow self-confidence.

Test: Trainees are asked to make a test that they must complete right after they finish the narrative phase. The style in which the request is made should sound funny and offer entertaining. Putting emphasis on what the trainer wants is not about assessing but helping trainees conceptualize their key learnings.

Helpful hints
<p>When using the Workshop Model, please remember it builds up from highly focused short sessions. Take time to do management lessons and routines to keep times and preserve high quality. One routine is about how to assign a task to a group. The logical order is as follows:</p> <ul style="list-style-type: none"> • Describe the context of the task. That is the “why” part. • Put it clear what you want in <i>one complete</i> sentence. • Let them know the tools and materials they can use during the task. • Tell them about the rules regarding the task. • Encourage them to raise questions regarding the tasks before start working. <p>Another routine that is especially helpful when making transitions: the transition bridges. Transition bridging skill is an ability to logically connect two seemingly unrelated things within seconds. The bridge helps trainers to jump from one topic to another smoothly. How you can practice:</p> <ul style="list-style-type: none"> • Write down 20 randomly chosen words (nouns) with big letters on an A4 sheet • Point on one word on the paper and improvise a small story with the word on the topic. • After 10 seconds, randomly point on another word on the paper and continue your speech with no halt or hesitation. • After another 10 seconds, point on another word and so on. Later, reduce timing for 5 second periods.

Trainers must be very specific when asking questions. The recommendation is that they write the question down after saying it. When trainees’ mind works to form the right answer to an open-ended question, they can easily get distracted if they have no chance to see the question again.

Dominance games should be avoided with deviant or distractor trainees. Trainers must focus on the topic(s) addressed in the session and use group technics such as sharing or presentation.

are called dominance games. Professional trainers should be prepared to bring dominance games down in a peaceful manner. Setting right rules for presentation such as keeping time, maintain focus on topics helps bring dominance games down.

3. Competence Matrices

Access to teaching and training professions differs between European countries and even between learning contexts, since most countries have specific regulations for teachers, but not necessarily for trainers' qualifications. In the specific case of WELDONE partners, only Portugal, Romania and Greece have specific qualifications for initial qualification of trainers.

As such, the ToT Curriculum also considers the different descriptions of the professional profile of teachers/trainers in partners' countries considering their connection to previous knowledge about the matters addressed by the ToT course. The table below lists those professional profile in the following partners' countries:

Table 2 Professional Profiles of Teachers/Trainers at the countries of WELDONE partnership

Country	Teachers/Trainers Professional Profile
Croatia	<p>"(...) is a person with the required level of qualification in the profession with the required pedagogical-psychological-didactic-methodological education required by the curriculum."</p> <p>(Source: Law on Vocational Education of the Republic of Croatia, Article 17, 2009)</p>
Greece	<p>"(...) are trainers for adults (or youngsters) who required to possess a teaching qualification awarded upon accreditation in order to fulfil eligibility conditions for public funded non-formal education programmes, pursuant to Law 3879, article 19.3 (GOG 163/A/21.09.2010) on "Development of Lifelong Learning".</p> <p>(Source: Greek National Certification Body (EOPPEP - https://www.eoppep.gr/index.php/en/qualifications-certification-en))</p>
Hungary	<p>"(...) In a VET school, the teacher must have higher education qualification appropriate to the sector and vocational qualification appropriate to the sector, or at least higher education qualification and a vocational qualification appropriate to the sector. The person teaching the practical knowledge must have at least bachelor's degree and a professional qualification appropriate to the sector.</p> <p>(Source: Government Decree on the Implementation of the Vocational Training Act No: 12/2020. (II.7.))</p>
Portugal	<p>"(...) is a qualified individual, with specific academic and professional qualifications, whose intervention assists the trainee in acquiring knowledge and / or developing skills, attitudes and forms of behaviour (...) with ability to adapt to different contexts, innovative, creative and mediator."</p> <p>(Source: Portuguese Institute for Employment and Professional Training - IEFP)</p>
Romania	<p>"In order to be part of the category of teaching staff (which includes leading teaching staff, teaching and practical training teachers and auxiliary teachers), one must comply with the conditions of study provided by law, must have the ability to fully exercise his/her rights, have a moral conduct in accordance with professional ethics and be medically and psychologically fit to perform the function.</p> <p>The teaching staff, evaluated based on an evaluation form brought to the notice at the beginning of each school year, has the obligation to participate in continuous training activities, in accordance with the law."</p> <p>(Source Law #1/2011, cumulated with Regulation - framework for the organization and functioning of pre-university education units // ROFUIP, 09.11.2020)</p>

Partners have defined the target groups of the WELDONE ToT Curriculum:

- Teachers/trainers belonging to EWF Qualification System, educators from STEM fields and from VET and/or adult education, interested in including the WELDONE approach in their training/teaching practice.

The process of developing the contents of each CU started with the development of their respective Competence Matrix.

Thus, the Competence Matrices were the cornerstones to structure the Competence Units (CUs) part of the ToT Curriculum. CUs are implemented and validated individually, and they are organized in terms of Learning Outcomes (LOs), with a set of Knowledge and Skills to be acquired by trainees (i.e., the teachers and trainers that go through the training).

The LOs of each Competence Matrix/CU were written in accordance with a specific European Qualifications Framework (EQF) level - EQF level 4 or EQF level 5, depending on the scope of the CU, set also considering the expected previous knowledge and skills the trainees have about the subject matters/topics addressed by the Competence Matrices/CUs.

In each Competence Matrix, its LOs are aligned with a specific EQF level indicator. Most Competence Matrices are, thus, aligned with EQF level 4, but there are also Competence Matrices written in line with EQF level 5.

The EQF level that the Competence Matrices refer to are not an entry requirement for the target groups; it reflects the level of expertise expected at the end of WELDONE Training of Trainers, characterized as follows:

Table 3 EQF level 4 and 5 | Learning Outcomes' description⁶

EQF Level	Knowledge	Skills	Responsibility and Autonomy
The learning outcomes relevant to Level 4 are:	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
The learning outcomes relevant to Level 5 are:	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

According to Cedefop "Glossary of key terms" (2008), Learning Outcomes are "Statements of what a learner knows, understands and is able to do on completion of learning process, which are defined in terms of knowledge, skills and competence". They are designed using a horizontal

⁶ Source: (EC, 2019) *Descriptors defining levels in the European Qualifications Framework (EQF)*, retrieved from <https://ec.europa.eu/ploteus/pt/node/1440>, in November 2020

axis that identifies the learning domains (e.g., knowledge and skills), and a vertical dimension that indicates the complexity of learning, which increases from level to level.

The Competence Units developed in the scope of WELDONE ToT Curriculum take this approach in consideration, defining not only the Learning Outcomes in terms of knowledge and skills, but also indicating the specific Subject Titles (i.e., topics addressed by the CUs), contact hours and the Workload, described as follows:

Hence, each Competence Matrix has defined:

Subject Titles – General curriculum contents.

Learning Outcomes – Organized/structured in terms of knowledge and skills, written in line with specific EQF level (4 or 5) descriptors.

Contact Hours – Total number of hours in which trainees are involved in theoretical and practical training in classroom context.

Workload – An estimation of the time learners typically needs to achieve the defined learning outcomes. It covers theoretical training and self-study, as well as the time devoted to practical training and examination. It is calculated by multiplying the total number of contact hours by two (e.g., $\text{Contact Hours} = 2 / \text{Workload} = 4$).

The ToT Curriculum is composed of the following Competence Units:

CU1 – Multiple Intelligences and Learning Styles;

CU2 – Learner Centered Didactics: Problem Based Learning, Critical thinking and Collaborative Learning;

CU3 – Gamification;

CU4 – Digital competence and using digital resources;

CU5 – New media didactics: the use of social media and micro-learning;

CU6 – Personal, social and learning competences;

CU7 – Entrepreneurship competence.

Below are their respective Competence Matrices.

Competence Matrix 1 | Multiple Intelligences and Learning Styles

Competence Matrix 1 Multiple Intelligences and Learning Styles		
SUBJECT TITLE		
Multiple intelligences theory		
Learning styles model		
MI theory and learning styles in curriculum design and implementation - a differentiated curriculum catering to both special and gifted education needs		
MI in testing and assessment		
CONTACT HOURS (Total)		10
WORKLOAD		20

LEARNING OUTCOMES	
“Multiple Intelligences and Learning Styles”	
KNOWLEDGE	<p>Factual and theoretical knowledge of the principles and applicability of:</p> <ul style="list-style-type: none"> - Multiple intelligences theory - Types of learning styles - Strengths and weaknesses of Multiple intelligences and Learning styles models - How to use MI theory and learning styles in curriculum design and implementation - How to use MI in testing and assessment
SKILLS	<ul style="list-style-type: none"> • Illustrate the main characteristics of each type of multiple intelligence and each type of learning style to better understand their practical application in the STEM learning environment. • Identify the strengths and weaknesses of the MI and Learning styles models to use them in accordance with the STEM learning environment. • Integrate learning styles and multiple intelligences in STEM courses to foster learners' progress. • Describe each of the Kolb's four learning styles and how they cater to student-specific teaching and types of activities. • Develop learning activities for STEM subjects that are in accordance with and best suited for the preferred type of student's intelligence and learning style. • Integrate assessment into learning - give students a chance to play an active role in their assessment. • Develop alternative assessment tools and strategies for STEM learning outcomes that evaluate more than one kind of intelligence to give each student a chance to excel and create a positive learning environment.

Competence Matrix 2 | Learner Centered Didactics: Problem Based Learning, Critical Thinking

Competence Matrix 2 Learner Centered Didactics: Problem Based Learning, Critical Thinking and Collaborative Learning		
SUBJECT TITLE		
Principles of Learner-Centered Didactics (LCD)		
Problem-Based Learning (PBL): impact on the learning process		
Critical Thinking (CT) and Learners' engagement with the learning process		
Collaborative Learning: Characteristics and benefits		
CONTACT HOURS (Total)		10
WORKLOAD		20

LEARNING OUTCOMES	
"Learner Centered Didactics: Problem Based Learning, Critical Thinking and Collaborative Learning"	
KNOWLEDGE	<p>Specialized factual and theoretical knowledge of the principles and applicability of:</p> <ul style="list-style-type: none"> - Learner-Centered Didactics (LCD) in the learning process, - Strategies used in LCD approach to improve the learning process, - Importance of Problem-Based Learning (PBL) in training and education, - Critical Thinking (CT) and its development throughout lifelong learning, - Specific thinking strategies to support learners' critical ability, - Critical Thinking in learners, - Learners' Collaborative Learning.
SKILLS	<ul style="list-style-type: none"> • Use LCD strategies in classroom to adapt the learning environment to learners' characteristics. • Create Problem-Based Learning (PBL) exercises for welding/STEM in accordance with the steps, resources and criteria needed for its implementation. • Select tools to foster Critical Thinking in learners, integrating them in the learning environment. • Plan a Collaborative Learning environment following its three-steps process to improve learners' group dynamics. • Use Collaborative Learning experiences to promote communication and cooperation between learners.

Competence Matrix 3 | Gamification

Competence Matrix 3 Gamification	
SUBJECT TITLE	
Gamification in skills' training	
The full game planning cycle	
An easy to use design framework	
Designing games to teach multiple skills	
The lifecycle of a game: what to do after the endgame?	
Extended Reality (XR) training (Virtual Reality and Augmented Reality) in the learning environment: benefits and costs	
CONTACT HOURS (Total)	14
WORKLOAD	28

LEARNING OUTCOMES "Gamification"	
KNOWLEDGE	<p>Specialized factual and theoretical knowledge of the principles and applicability of:</p> <ul style="list-style-type: none"> - Gamification in education - Designing games based on Mechanics, Dynamics and Emotions (MDE) framework - Toolbox of gamification: Mechanics – types of setups, roles and rules - Virtual Reality (VR) and Augmented Reality (AR) technologies - Extended Reality (XR) training and real training
SKILLS	<ul style="list-style-type: none"> • Identify the potentialities and limitations of gamification to exploit its benefits in accordance with different learning contexts. • Apply game design principles to foster skills' development running the whole game design cycle (from idea to redesign). • Plan and implement gamification in welding/STEM training activities to promote learners' learning through iteration. • Integrate VR and/or AR technologies in game design to foster motivation and planning skills on learners. • Develop assessment strategies using gamification to assess learners' achieved learning outcomes. • Integrate briefing and debriefing strategies to assess learners' performance based on the dynamics experienced in the game. • Apply XR training, VR and AR technologies in teaching, combining virtual and real game mechanics in STEM learning. • Generate support and manage competition situations during learning to promote problem-solving dynamics between learners.

Competence Matrix 4 | Digital Competence and using digital resources

Competence Matrix 4 Digital Competence and using digital resources		
SUBJECT TITLE		
Digital data and digital information		
Digital devices and equipment		
Online environment		
Online and offline digital tools dedicated to learning processes		
Digital communication and networking		
Digital Media		
CONTACT HOURS (Total)		12
WORKLOAD		24

LEARNING OUTCOMES	
“Digital Competence and using digital resources”	
KNOWLEDGE	<p>Factual and theoretical knowledge of the principles and applicability of:</p> <ul style="list-style-type: none"> - Digital data and digital information - Digital equipment - Online communication technology and devices - Digital Media - Digital tools dedicated to learning processes - Internet environment, browsers, ethics and threats
SKILLS	<ul style="list-style-type: none"> • Use digital data and information. It is important to know about the data and the digital information and for that specific knowledge is necessary. At the same time, it is important to know how to operate with the data, and that means specific skills. • Use digital resources for online and offline information to provide learners learning contents in line with training purposes. • Create learning contents using digital devices and communication techniques to integrate them on online learning platforms. • Connect with online learning communities using various digital devices to carry out networking and sharing of educational materials. • Use different digital tools in line with ethical/legal issues to receive information from Media that can be applied to the learning process. • Use existent digital tools dedicated to teaching and learning processes to manage training strategies and assess learners’ performances. • Use the internet as learning and teaching resource in line with the existent rules and principles to avoid risks and threats that can target learners or the learning environment. • Use Cloud Computing as a converging technology to work and save the produced information/content.

Competence Matrix 5 | New Media Didactics: The use of social media, micro-learning

Competence Matrix 5 New Media Didactics: The use of social media and micro-learning		
SUBJECT TITLE		
New Media Didactics: challenges and opportunities		
Microlearning applied to social media		
Communication and cooperation		
Design of microlearning content		
Privacy and Security		
Teaching and learning through application of the new didactical integrated model		
CONTACT HOURS (Total)		10
WORKLOAD		20

LEARNING OUTCOMES	
“New Media Didactics: The use of social media and micro-learning”	
KNOWLEDGE	<p>Specialized, factual and theoretical knowledge of theory, principles and applicability of:</p> <ul style="list-style-type: none"> - New Media Didactics: challenges and opportunities - Communication and cooperation on social media - Design of micro-learning content and its integration into social media - Security and privacy on social media - Teaching, learning and assessing through application of the new didactical integrated model
SKILLS	<ul style="list-style-type: none"> • Apply integrated interactive systems based on combination of social media and micro learning for modernisation of the teaching process. • Ensure a high level of communication and cooperation on social media for good interaction during the teaching process. • Select data, information and content on social media to integrate them in training activities as part of learners’ routines. • Apply GDPR regulations to ensure security of one's own and learners’ personal identity. • Design STEM micro-learning contents, integrating them into social media platforms to improve the learning process. • Use micro-learning content and assignments on social media to assess learning. • Exchange knowledge and experience on subject area and teaching practice in virtual environment for personal development and growth.



Competence Matrix 6 | Personal, social and learning competence

Competence Matrix 6 Personal, social and learning competence	
SUBJECT TITLE	
Conceptualizing of Personal, social and learning competence	
The “three dimensions” of the Competence (personal – social – learning)	
Self-awareness (P)/ Self-management (P)	
Time Management in classroom (P)	
Emotional Regulation (P)	
Effective Communication (S)	
Conflict Management (S)	
Constructive Team working (S)	
Learning to Learn (L)	
Dropping out prevention (L)	
Interculturality (L)	
CONTACT HOURS (Total)	11
WORKLOAD	22

LEARNING OUTCOMES “Personal, social and learning competence”	
KNOWLEDGE	Factual and theoretical knowledge of: <ul style="list-style-type: none"> - The three dimensions of Personal, Social and Learning Competence, as well as the main elements that are included in this specific concept - Self – awareness and Self-management techniques - Methodologies about Time Management in classroom setting - Effective Communication principles (assertiveness, active listening, etc.) - Emotional regulation rules and how they can be applied in classroom - Conflict Management theories and techniques - Methods to build trust and teamwork in a constructive way - “Learning to Learn” theoretical approach and its appliances - Techniques to prevent drop out phenomenon - Basic principles of “interculturality” (tolerance, diversity, acceptance) and tools to apply it in the classroom
SKILLS	<ul style="list-style-type: none"> • Integrate theoretical contents in practical exercises through the implementation of technical workshop providing quality and engaging lectures, mentoring and enabling them access to resources and literature. • Update existent educational methods/techniques, maintaining personal and professional development consistency, to introduce innovations at global level • Maintain awareness of one’s own identity to foster inner balance and stability to regulate and cope with undesirable emotions that may arise during the educational process. • Critically reflect and distance oneself from one’s own perceptions, biases, and stereotypical constructions of reality to promote an effective learning through increasing self-awareness and managing self-limiting beliefs, recognizing unconscious thinking, personal boundaries and external and internal conflicts. • Listen actively to gain an insight into learners’ needs and strengths showing a willingness and ability to look at learners’ identity, culture and its related aspects and dimensions from different perspectives to promote inclusion. • Express thoughts and emotions to build a trustful relation with learners and at the same time maintain professional boundaries, establishing a connection with the learner. • Set up an effective learning environment integrating relevant methodologies and techniques for enhancing planning skills.

Competence Matrix 7 | Entrepreneurship competence

Competence Matrix 7 Entrepreneurship competence	
SUBJECT TITLE	
Definition of the Entrepreneurship competence	
Relevance of developing the Entrepreneurship competence in learners	
Competence oriented approach for teaching and learning	
What makes an entrepreneurial teacher?	
Practical entrepreneurial experiences – definition	
The 3 competence areas of the Entrepreneurship Competence Framework: Ideas & Opportunities, Resources and Into Action	
CONTACT HOURS (Total)	12
WORKLOAD	24

LEARNING OUTCOMES “Entrepreneurship competence”	
KNOWLEDGE	<p>Factual and theoretical knowledge of the principles and applicability of:</p> <ul style="list-style-type: none"> - Entrepreneurship competence according to Key Competences for LLL - Competence oriented approach for teaching and learning - Definition of an entrepreneurial teacher <ul style="list-style-type: none"> o Active methods of engaging learners to release their creativity and innovation o Cooperation and partnerships with colleagues, businesses and other stakeholders - Practical entrepreneurial experiences
SKILLS	<ul style="list-style-type: none"> • Recognise EntreComp Framework and its three competence areas to organise and prioritise action in an Entrepreneurship competence-oriented approach • Define what makes a teacher an entrepreneurial one, recalling practical entrepreneurial teaching experiences to prove the efficacy of renewed practices • Design pedagogical improvement strategies aligned with the WELDONE way for teaching STEM topics based on a clear understanding of its strengths/advantages and weaknesses/disadvantages, to improve learning results • Discuss the need for investing time in embedding entrepreneurship key competence development in the subjects, inspiring relevant stakeholders, to get the support needed to implement the WELDONE way • Prepare an action plan to get the resources needed to turn ideas into action, selecting the material, non-material and digital resources needed • Weigh the risks and benefits of embedding entrepreneurship key competence development strategies in training, reflecting on failures (own and other people's) and identifying their causes • Define priorities in uncertain circumstances, with partial or ambiguous information deciding when it is not worth continuing with an idea • Develop a vision and a strategy to embed entrepreneurship key competence development in teaching practices • Set long, medium and short-term goals to embed entrepreneurship key competence development in own training/teaching activity.

4. Competence Units | Contents

This section focuses on each Competence Unit (CU) part of the ToT Curriculum, developed in line with the respective Competence Matrices elaborated by WELDONE Partners, addressed in the previous section. Therefore, for each CU, information is provided on the following sub-sections:

a. Context

- *What is this Competence Unit about?*

Explanation about the matters addressed by the CUs

- *Why is it important?*

Includes impact of the CU towards trainees' skills and competences and how they can include what they learn in their own work with learners

- *Relation with key competences' development and/or other Competence Units?*

Connection between the CUs and the key competences they address, in line with WELDONE purposes. In case there is a connection between other CU of the ToT Curriculum, that information is also provided, including how they connect.

b. Competence Unit | Workshop Session

This sub-section provides information about the pedagogical approaches and assessment tools developed and recommended by WELDONE to be implemented with the CUs during the workshop sessions, as well as their purposes and application, focusing on:

- Number and duration of the workshop sessions (aligned with the CUs' contact hours/workload);
- Topics addressed in each session (aligned with the Subject Titles of each CU),
- Pedagogical approach;
- Human and/or materials resources needed;
- Exercises to carry out during the session(s), including description of their purposes and operationalization;
- Assessment tools to implement to assess trainees' achievement of the Learning Outcomes established to that specific CU.

Competence Unit 1 | Multiple Intelligences and Learning Styles

A. Context

What is this Competence Unit about?

The focus of this Competence Unit is on the theory of Multiple Intelligences (MI) and the theory of Learning Styles (LS) as well as on their practical integration in curriculum development, in assessment and in the classroom itself. The following contents will consider all implications of the two theories in the educational and learning process.

The Theory of Multiple Intelligences (MI)

Howard Gardner is a developmental psychologist best-known for his theory of Multiple Intelligences. Gardner's theory was originally intended for the field of psychology but has received a great deal of attention in the field of education. He believed that the conventional concept of intelligence was too narrow and restrictive and that measures of Intelligence Quotient (IQ) often miss out on other "intelligences" that an individual may possess. He argued there are seven (later on eight) discrete "intelligences" in human beings, explained in his book *Frames of Mind* (Gardner, 1989) as follows:

1. Bodily-kinaesthetic: control of one's bodily/physical motions and the capacity to handle objects skilfully.
2. Interpersonal: interactions with others, including recognising and understanding other people's moods, feelings and motivation.
3. Intrapersonal: introspective and self-reflective capacities (understanding one's own emotions, ideas and motivation).
4. Logical-mathematical: having to do with logic, abstractions, reasoning, numbers, and critical thinking.
5. Musical: rhythmic and harmonic-sensitivity to sounds, rhythms, tones, and musical rhythm.
6. Naturalistic: nurturing relating information to one's natural surroundings (added later on).
7. Verbal-linguistic: displaying a facility with words and languages, including the ability to analyse information).
8. Visual-spatial: deals with spatial judgment and the ability to visualise objects and spatial dimensions.

The theory of Learning Styles

Understanding and applying specific types of multiple intelligences in the learning process is beneficial for the learners. However, learning styles are just as important. The term "learning styles" speaks to the understanding that every learner learns differently. Technically, an individual's learning style refers to the preferential way in which the learner absorbs, processes, comprehends and retains information.

Though the concept of learning styles is relatively recent, having gained ground in the 1970s, it has become an important process in the modern education, especially on matters concerning how teachers use it in the curriculum deployment and how it is used in the development of the curriculum. It has been found out that if teachers understand the learning styles of their learners, they can adapt their strategies and methods and make the process of learning interesting to their learners. Therefore, it has been found quite important to integrate the various learning styles of learners in the curriculum to ensure that the curriculum meets the needs of the various learners, who are taught using the same curriculum. (Wang and Nagy, 2007).

One of the most accepted understandings of learning styles is that learners' learning styles fall into four categories. These learning styles are found within educational theorist Neil Fleming's VARK model of Student Learning. VARK is an acronym that refers to the four types of learning styles: Visual, Auditory, Reading/Writing Preference, and Kinaesthetic. (The VARK model is sometimes also referred to as the VAK model, eliminating Reading/Writing as a category of preferential learning.) The VARK model acknowledges that learners have different approaches to how they process information, referred to as "preferred learning modes." The main ideas of VARK are outlined in *Learning Styles Again: VARKing up the right tree!* (Fleming & Baume, 2006).

Visual

- Visual learners prefer the use of images, maps, and graphic organizers to access and understand new information.

Auditory

- Auditory learners best understand new content through listening and speaking in situations such as lectures and group discussions. Aural learners use repetition as a study technique and benefit from the use of mnemonic devices.

Read & Write

- Students with a strong reading/writing preference learn best through words. These students may present themselves as copious note takers or avid readers, and are able to translate abstract concepts into words and essays.

Kinesthetic

- Students who are kinesthetic learners best understand information through tactile representations of information. These students are hands-on learners and learn best through figuring things out by hand (i.e. understanding how a clock works by putting one together.)

(Figure retrieved from <https://teach.com/what/teachers-know/learning-styles/>)

David Kolb published his learning styles model in 1984 from which he developed his learning style inventory. Kolb's experiential learning theory works on two levels: a four-stage cycle of learning and four separate learning styles. Much of Kolb's theory is concerned with the learner's internal cognitive processes. He states that learning involves the acquisition of abstract concepts that can be applied flexibly in a range of situations. In Kolb's theory, the impetus for the development of new concepts is provided by new experiences.

Knowing a person's (and your own) learning style enables learning to be orientated according to the preferred method. That said, everyone responds to and needs the stimulus of all types of learning styles to one extent or another - it's a matter of using emphasis that fits best with the given situation and a person's learning style preferences. Here are brief descriptions of the four Kolb learning styles:

Diverging (feeling and watching)

People with a diverging style can look at things from different perspectives. They are sensitive. They prefer to watch rather than do, tending to gather information and use imagination to solve problems. They are best at viewing concrete situations from several different viewpoints.

Kolb called this style 'diverging' because these people perform better in situations that require ideas-generation, for example, brainstorming. People with a diverging learning style have broad cultural interests and like to gather information.

They are interested in people, tend to be imaginative and emotional, and tend to be strong in the arts. People with the diverging style prefer to work in groups, to listen with an open mind and to receive personal feedback.

Assimilating (watching and thinking)

The assimilating learning style involves a concise, logical approach. Ideas and concepts are more important than people.

These people require good clear explanation rather than a practical opportunity. They excel at understanding wide-ranging information and organizing it in a clear, logical format.

People with an assimilating learning style are less focused on people and more interested in ideas and abstract concepts. People with this style are more attracted to logically sound theories than approaches based on practical value.

This learning style is important for effectiveness in information and science careers. In formal learning situations, people with this style prefer readings, lectures, exploring analytical models, and having time to think things through.

Converging (doing and thinking)

People with a converging learning style can solve problems and will use their learning to find solutions to practical issues. They prefer technical tasks and are less concerned with people and interpersonal aspects.

People with a converging learning style are best at finding practical uses for ideas and theories. They can solve problems and make decisions by finding solutions to questions and problems.

People with a converging learning style are more attracted to technical tasks and problems than social or interpersonal issues. A converging learning style enables specialist and technology abilities.

People with a converging style like to experiment with new ideas, to simulate, and to work with practical applications.

Accommodating (doing and feeling)

The Accommodating learning style is 'hands-on,' and relies on intuition rather than logic. People with this learning style use other people's analysis, and prefer to take a practical, experiential approach. They are attracted to new challenges and experiences, and to carrying out plans.

They commonly act on 'gut' instinct rather than logical analysis. People with an accommodating learning style will tend to rely on others for information than carry out their own analysis. This learning style is prevalent within the general population.

Both Kolb's learning stages and cycle could be used by teachers to critically evaluate the learning provision typically available to learners, and to develop more appropriate learning opportunities (more on Kolb's experiential learning cycle can be found in section 2.1 of this Curriculum, pages 8-9).

If a teacher is having difficulty reaching a learner in the more traditional linguistic or logical ways of instruction, the theory of multiple intelligences suggests several other ways in which the material might be presented to facilitate effective learning.

Educators should ensure that activities are designed and carried out in ways that offer each learner the chance to engage in the manner that suits them best. In other words, teachers should get to know their learners right at the beginning and discover which multiple intelligence is best developed with them and which learning style suits them most and design the activities accordingly.

Although some teachers see themselves as the giver of knowledge, the supporters of the Theory of Multiple Intelligences are more careful and see themselves as guides or facilitators. They are there to help children discover resources and to support their curiosity in productive ways.

Ideally, teachers should investigate the efficiency of Theory of Multiple Intelligences to accurately implement this theory as it was intended to be used. It must be properly researched and assessed regularly. It is important to know the materials and their intended purpose. In other words, understand the theory and an understanding of its implementation and its implications. Because there is not a prescribed way to put Gardner's theory into practice, teachers, to a large degree, need to use their creativity. This is not a scripted structure, but an idea that can be incorporated to varying degrees.

Gardner also argued that culture plays a large role in the development of the intelligences. All societies value different types of intelligences and the cultural value placed upon the ability to perform certain tasks provides the motivation to become skilled in those areas. So, this is another aspect for teachers to bear in mind.

Why is it important?

Learners who do not retain or understand information presented in the traditional format are often labelled or thought of as incapable, inadequate, or struggling learners, in some cases, causing them to develop a sense of low self-esteem.

The theory of Multiple Intelligences (MI) is there to help learners in the classroom who do not respond productively to rote memorization and direct instruction. The MI theory can draw learners back into

learning. Using the different intelligences to teach a concept allows each of your diverse learners a chance to succeed at learning.

Everyone who is involved in education will agree that there is a relationship between a teacher's instructional style and learner success.

Teachers should use the most effective and efficient methods of teaching to engage the learners, who need to feel at ease, comfortable, supported, and valued to thrive.

The materials can act as resources and support while also contributing to the encouragement of the classroom. When the MI theory is used correctly, learners thrive, become confident, explore, feel safe to try new things, and believe in themselves.

Modern approaches to education call for allowing learners to receive information in numerous ways other than direct instruction. By alternating the delivery method of instruction, the teacher increases the likelihood of making connections with more learners. Having a single way of teaching is narrowing the prospective audience considerably, which limits the amount of learning within a classroom. The teachers need to be flexible with their instructional style. While it is not reasonable to expect we can teach to all the intelligences, it is completely reasonable to assume we can teach to more than one. It is, therefore, crucial that teachers assess the learning that takes place in different domains, and by different cognitive processes.

Gardner asserted that intelligences are not fixed; they are growing and expanding constantly. The MI theory holds that all learners can become smarter across all the intelligences, although this does not mean that learners should or must excel in all areas. While all humans possess all intelligences, each of us also possesses our own array of strengths and preferences... The implications for the classroom, then, are found in both curriculum and assessment. By recognizing in what areas an individual is strong, they might better be able to strengthen areas of great skill or choose to focus on areas of need.

Incorporating MI Theory in a Classroom/Assessment

For this incorporation to be done effectively and efficiently, the teacher must be able to first identify the learner's strengths correctly in these fields of intelligence. To accurately introduce the MI theory into curriculum planning, the teacher must feel confident in identifying the intelligences that their learners possess. They are not likely to implement it if they are not confident that they will do so correctly.

One of the biggest challenges with incorporating this in modern schools is the question of how to best assess its results. Everyone involved in education will admit that current assessments do not portray a learner's true knowledge.

So, the vital question is: How do we find out what learners know? And what is more important - how do we assess it? Many teachers are not comfortable incorporating a system into schools that does not come with prescribed assessments and measurable results.

There is a certain resistance and concern among critics of the MI theory. They stress the importance of understanding that intelligences work in combination, not isolation. No intelligence works in isolation in the real world.

There is also confusion of how these intelligences are inter-related. We all possess each of these intelligences, but to differing levels of strength and weakness. We also use them in harmony with each other; it is not using them in isolation.

Gardner also pointed out both a potential benefit and a drawback of identifying one's current "intelligences profile". Although knowing one's strengths and weaknesses can be helpful, it can also lend people permission to set limits on themselves and others - both consciously and unconsciously (Chipongian, 2000). This further supports the notion that MI theory must be fully understood by teachers to properly incorporate it into their classroom and curriculum planning. While there are numerous types of intelligences, we must be careful to not confuse these with interests which can overlap significantly if not properly assessed.

Since no single approach to teaching and assessment can possibly work best for every learner, teachers face a challenge: What's the best way to match assessments to learners' learning styles?

Of course, assessment should fit the diversity of intelligences and learning styles in the classroom. In fact, traditional testing methods are inherently biased in favour of learners with strong linguistic and mathematical skills. Advocates of MI theory suggest that teachers supplement their traditional assessment methods with assessment strategies that evaluate learners' progress in an inclusive, meaningful way. All this speaks in favour of the importance of knowing your learner's learning style. A learning style is an individual's approach to learning based on strengths, weaknesses, and preferences. And knowing it is important if you want to achieve to the best of your ability. When it comes to processing information, the brain is the most important part of someone's body. This notion of individualized learning styles has gained widespread recognition in education theory and classroom management strategy. Individual learning styles depend on cognitive, emotional and environmental factors, as well as one's prior experience. In other words: everyone's different. It is important for teachers to understand the differences in their learners' learning styles, so that they can implement best practice strategies into their daily activities, curriculum and assessments. Identifying your learners as visual, auditory, reading/writing or kinaesthetic learners, and aligning your overall curriculum with these learning styles, will prove to be beneficial for your entire classroom. Allowing learners to access information in terms they are comfortable with will increase their academic confidence.

Both the special education and gifted education literature call for a differentiated curriculum to cater for the wide range of learner differences in any classroom. Gardner's theory of multiple intelligences can be integrated with the revised Bloom's taxonomy to provide a planning tool for curriculum differentiation.

The teachers should broaden their curriculum and cater for different learners' strengths across the multiple intelligences and intellectually challenge the learners using first the original and then the revised taxonomy. The modern educational context calls for inclusion of learners with disabilities and learning difficulties in the regular classroom. The gifted education movement has long claimed that gifted children are unchallenged and are underachieving in the mixed ability classroom. Both movements call for a differentiated curriculum that acknowledges learners' diverse strengths rather than their deficits and provides flexibility in terms of content, processes, and products to cater for learners' individual learning needs.

Relation with key competences development and/or with other Competence Units

CU1 is connected to all other CUs as it applies to all of them. Whenever someone engages in a learning process, they are bound to use their preferred learning style(s) and make use of the type(s) of MI that are most developed in their specific case. Competence Unit 1 is also in direct connection with Competence Unit 6 - Personal, Social and Learning Competence as it addresses topics such as self-awareness, effective communication, constructive teamwork and learning to learn. All these are closely connected to the theory of MI and LS since one's academic success is dependent on their implementation and application in the educational context.

B. Competence Unit 1 | Workshop Session

Number of Sessions & Duration

1 session (4 hours); 2 sessions (3 hours each - 10 hours total)

List of topics to cover in the Workshop sessions

- ✓ Types of Multiple intelligences
- ✓ Types of Learning styles

- | | |
|---|--|
| ✓ | How to use MI theory and learning styles in curriculum design and implementation |
| ✓ | How to use MI in testing and assessment |

Pedagogical Approach

Practical application of the multiple intelligences and learning styles theories in the classroom / learning environment;

This approach is applicable to the workshop model promoted by WELDONE as it allows trainees to choose the type of exercises that suit their MI and LS type the best, thus showcasing how giving learners a choice boosts their engagement.

Each workshop session consists of:

- Opening: The trainer indicates the purpose of the session and the LOs to be addressed
- Mini lesson: Lecture about the topics to be covered
- Work time: Activities/exercises developed for this CU
- Debriefing.

Required resources for Training

Material:

Whiteboard/flipchart
Hand-outs
Post-its
Markers
Laptop

WELDONE Exercises | CU1

Exercise 1.1 Multiple intelligence test
<p>Objective(s): To determine which type(s) of intelligence is/are best developed with each participant /trainee to adapt materials/exercises later.</p> <p>Operationalization: Each participant is given a MI test to fill out. There are many existing tests available, and they vary in length and way of interpretation. For this workshop, we have chosen two that take no longer than 20 minutes and the results are available within few minutes. This is not a scientific method to be taken very seriously, but rather a tool that facilitates the implementation of the general idea of this CU. The results of the test are available within few minutes. Each participant will brief the rest on their own result. Detailed information on the operationalization of this exercise can be found here.</p>

Exercise 1.2 Show your intelligence
<p>Objective(s): Practical application of test results through specific assignments/exercises.</p> <p>Operationalization:</p>

Assignments for all 7 types of MI will be prepared ahead to be ready for all possible test results. Depending on these results, the assignments will be carried out individually/in pairs/in small groups. The exercises will cover the STEM area where possible. Detailed information on the operationalization of this exercise can be found [here](#).

Exercise 1.3 Activities Across 8 Multiple Intelligences
<p>Objective(s): Give teachers/trainers the idea on how to use their learners' strengths in the classroom to their advantage (the topics are easily adaptable to learners' needs/preferences, these are only suggestions).</p> <p>Operationalization: This exercise lists possible assignments for all 8 types of multiple intelligences. As already stated, these serve only as inspiration for teachers/trainers and are to be adapted according to the structure of the course/learners and their type of MI. Detailed information on the operationalization of this exercise can be found here.</p>

Exercise 1.4 Multiple Intelligences Matching Quiz
<p>Objective(s): Apply the principles of MI theory.</p> <p>Operationalization: Each group is given a handout (can be found in attachment) a) Match the person with the intelligence at the right. b) Work with other learners in the group to give examples of other famous people for each of the MI types. One person from each group reports their findings. Detailed information on the operationalization of this exercise can be found here.</p>

Exercise 1.5 Multiple intelligence - Matching exercise
<p>Objective(s): How to learn to easily recognise which MI is most developed with your learners by matching the characteristics with specific types of MI.</p> <p>Operationalization: This exercise can be executed in paper form or as an interactive worksheet. a) Interactive mode: Create an interactive worksheet with a matching exercise. The worksheet should contain a table with 8 columns, each column representing 1 type of MI. Characteristics typical of the 8 respective MI types are listed above or below the table (depending on the preference). Trainees drag each characteristic to the corresponding column of the table. b) Paper mode: Give each pair/group of teachers/trainers one flipchart paper and cut out characteristics of MI types. They draw a table with 8 columns and distribute the cut-out characteristics across the table. Detailed information on the operationalization of this exercise can be found here.</p>

Exercise 1.6 Using Multiple Intelligences Theory in Choosing a Career
<p>Objective(s): Apply the principles of MI theory; Help trainees realise how they can guide their learners towards a career.</p> <p>Operationalization: Divide participants into small groups. Let them discuss and write down 3-5 occupations that are "typical" for each of the MI types according to their primary intelligence. Each group presents their answers, and the facilitator writes them down on the whiteboard/flipchart. Detailed information on the operationalization of this exercise can be found here.</p>

Exercise 1.7 What's your learning style?
<p>Objective(s): To determine which type(s) of learning style is best suited for each trainee/learner.</p> <p>Operationalization: Each participant is given a LS test to fill out. Just as with MI, there are many existing tests available, and they vary in length and type as there are several theories of LS in existence. In this CU, we have gone with the VARK model so the test we have chosen will cover the four learning styles within this model. Again, this is not a scientific method to be taken very seriously, but rather a tool that facilitates the implementation of the general idea of this CU. The results of the test are available within few minutes. Each participant will debrief the rest of the group on their own result. Detailed information on the operationalization of this exercise can be found here.</p>

Exercise 1.8 Learning Style Memory Exercise (15 items)
<p>Objective(s): This hands-on activity involves learners in learning and helps them to think about their learning style (in this case, participants of the ToT curriculum from the perspective of learners). It is a great way to introduce the idea of learning styles to learners. To begin, briefly introduce the concepts of visual, auditory and kinaesthetic/tactile learning.</p> <p>Operationalization: Bring 15 items to class. Choose items that can be seen, heard and touched. Make sure you have a variety of shapes, sizes and colours. Place all these items in a bag or a box. Bring each item out of the bag/box and pass it around in the class. Participants will have the opportunity to look at each item, feel it and hear it. Ask them to pass the items quickly. Tell participants that they will be asked to remember each of the items at the end of the exercise. When all the items have been passed around and returned to the bag/box, have participants see if they can recall all the items and write them down on a sheet of paper. To check the written lists, bring the items out of the bag/box again and set them on a table or desk. Then discuss the results asking questions to start a discussion. Detailed information on the operationalization of this exercise can be found here.</p>

Exercise 1.9 Paper Airplane Exercise (A Learning Styles Demonstration)
Objective(s): Demonstration of different learning styles.
Operationalization: Provide each trainee with 3 sheets of blank paper. Have them clear their desk except for 1 piece of paper oriented in the portrait position. This exercise consists of 3 rounds: Round 1 – Auditory Round 2 - Visual Round 3 - Kinaesthetic In each round, the instructions on how to make a paper plane are delivered in a different way. At the end, when all the planes have been made, have the trainees reflect on their work and tell which plane was the most successful and why. Detailed information on the operationalization of this exercise can be found here .

Exercise 1.10 Short Term Memory Variation: Learning Styles
Objective(s): Using different learning styles in memory exercises
Operationalization: This is a memory exercise. It is conducted using an activity sheet and telephone numbers. After the trainees go through all the 12 steps of the exercise, they answer the questions on the bottom of the page. A discussion of the results will lead to the characteristics of short-term and long-term memory. There are several variations to this exercise. Detailed information on the operationalization of this exercise can be found here .

Exercise 1.11 Learning Styles - Listening activity
Objective(s): Demonstration of different learning styles through a listening activity
Operationalization: This activity has three parts, each of which will demonstrate a different learning style. Part 1: Pass out the ear plugs and have everyone insert them. Then draw—without writing words or speaking—the introduction to a famous speech (e.g., „a small step for man, a giant leap for mankind”, etc.) on the drawing board. After you have drawn a sequence of the speech, have participants remove their ear plugs and ask them what you were communicating. Part 2: Stand and read aloud to the group another famous speech or poem (make sure it is not something already memorized by the participants). Instruct the group not to take notes. When you are finished, ask the group to reconstruct the speech or poem. Part 3: Write on the board another poem or speech (perhaps something by Dr. Seuss) while the group copies it word for word. When you are finished, have the participants put away their notes and as a group recite the poem or speech. Then generate a discussion by asking questions. Detailed information on the operationalization of this exercise can be found here .

WELDONE Assessment Tools |CU1

Assessment tool 1A Interview - unstructured (discussion using probe questions)
<p>Objective(s): This formative assessment method is made for exercise 1.9 - Learning Style Memory Exercise (15 items) The learning outcome that is covered by this assessment tool:</p> <ul style="list-style-type: none"> Illustrate the main characteristics of (each type of MI and) each type of learning style to better understand their practical application in the STEM learning environment. <p>Unstructured interviews are used when the interviewer wants to let the interviewee have complete control over the content of the interview. The interviewer usually prepares one or two questions to start off the interview. Only probe questions would then be used for the rest of the interview for further elaboration of a topic.</p>
<p>Operationalization: This assessment method is carried out at the very end of the exercise. The discussion/checking of the results proceeds by asking following questions:</p> <ul style="list-style-type: none"> What did you forget and why? How did you remember the items? What strategies did you use? Did it help you to remember the items because you could touch them? See them? Hear them? How many of you think you are kinaesthetic/tactile learners? Auditory learners? Visual learners? Was it more difficult to remember the unfamiliar items? <p>Interesting discussion about learning styles is generated by the above method. Many participants realize that they are kinaesthetic/tactile learners and can apply learning techniques related to this style, such as taking notes. More details about this tool can be found here.</p>

Assessment tool 1B Online/Paper Quiz
<p>Objective(s): This assessment method is made for exercise 1.5 - Multiple intelligence - Matching exercise The learning outcome covered by this method is:</p> <ul style="list-style-type: none"> Illustrate the main characteristics of each type of MI (and each type of learning style) to better understand their practical application in the STEM learning environment. <p>In other words - How to learn to easily recognise which MI is most developed with your learners/trainees by matching the characteristics with specific types of MI. This method can be used for both formative and summative assessment depending on what the teacher's/trainer's goal is.</p>
<p>Operationalization: This method can be executed in paper form or as an interactive worksheet.</p> <p>a) Interactive mode: Create an interactive worksheet with a matching exercise (quiz). The worksheet should contain a table with 8 columns, each column representing 1 type of MI (inputs can be taken from links below). Characteristics typical of the 8 respective MI types are listed above or below the table (depending on the preference). Trainees drag each characteristic to the corresponding column of the table.</p> <p>b) Paper mode: Give each pair/group of teachers/trainers one flipchart paper and cut out characteristics of MI types. They draw a table with 8 columns and distribute the cut-out characteristics across the table.</p>

More details about this tool can be found [here](#).

Assessment tool 1C Art
<p>Objective(s): This formative assessment method is made for exercise 1.3 - Activities Across 8 Multiple Intelligences targeting:</p> <ul style="list-style-type: none"> a) bodily/kinaesthetic learners (those enjoying dancing, crafts, or sports); b) visual/spatial learners (those enjoying drawing and painting). <p>This assessment method covers the following learning outcome:</p> <ul style="list-style-type: none"> • Develop learning activities for STEM subjects that are in accordance with and best suited for the preferred type of learner's intelligence.
<p>Operationalization: a) This method is cross-curricular, connecting biology and geography. Activity: Use the human body as a "map" for learning new information in different subjects. In geography, for example, the body might represent Europe. If the head is Scandinavia, then where is Italy? b) Play drawing games such as <i>Pictionary</i> or <i>Charades</i>. Have learners make rapid drawings to capture key points being discussed in a class lesson. More details about this tool can be found here.</p>

Assessment tool 1D Interview - structured
<p>Objective(s): This assessment method is made for exercise 1.2 - Show your intelligence targeting logical-mathematical learners. The learning outcome that is covered by this assessment tool is</p> <ul style="list-style-type: none"> • Develop alternative assessment tools and strategies for STEM learning outcomes. <p>The idea behind this method is to choose a slightly more complex topic/process from the STEM area, e.g., differences between a Diesel and an Otto engine.</p>
<p>Operationalization: There are different types of interviews that can be used for the purpose of assessment - casual chats with learners, five-minute interview assessments and structured/unstructured interviews. The same principle applies here, depending on what the teacher/trainer wishes to achieve. If the purpose is to simply find out whether the learner has grasped the basic differences between the two abovementioned concepts, then a short 5-minute interview works well. However, in depth "structured" interviews with a handful of carefully selected learners will enable the teacher/trainer to readily judge the extent of understanding the learners have developed with respect to a series of well-focused, conceptually related scientific ideas. It is important to note that the goal of the interview is to describe how a learner understands a scientific concept or phenomenon, and not simply to provide a measurement of the degree to which this understanding approximates the scientific explanation. More details about this tool can be found here.</p>



Assessment tool 1E Writing
<p>Objective(s):</p> <p>This assessment method is made for exercise 1.2 - Show your intelligence targeting verbal-linguistic learners.</p> <p>This assessment tool covers the learning outcome</p> <ul style="list-style-type: none"> Develop alternative assessment tools and strategies for STEM learning outcomes. <p>When using writing as an assessment method and assigning essays, one must bear in mind the purpose of the assignment and what one wants to achieve/what kind of feedback one is looking for. Accordingly, writing can be used both in a formative and summative way, always taking into consideration the (dis)advantages of the method.</p>
<p>Operationalization:</p> <p>Areas of application for this method are numerous just as the number of school subjects it can be applied in.</p> <p>Some of the possibilities are comment on a recent event or take an important event from the history, write a speech for a specific occasion, describe the working principle of a machine, give your opinion on a social matter, describe development of a product ... - the ones in bold being best suited for STEM area.</p> <p>Suggestions on how to prepare and assess an essay can be found here.</p>

Required resources for Examination

<p>Material</p> <p>Flipchart</p> <p>Markers</p> <p>Laptop and internet connection</p>
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Competence Unit 2 | Learner-Centered Didactics: Problem-Based Learning, Critical Thinking, and Collaborative Learning

A. Context

What is this Competence Unit about?

This Competence Unit (CU) addresses the Learner Centered Approach and its different pedagogical strategies, aiming to capacitate teachers/trainers to engage and encourage their learners' active involvement in the learning process and experience by using those strategies, hence replying to the growing need to stimulate active learning and to encourage learners to be creative and critical thinkers, able to work collaboratively with each other.

The Learner Centered Approach and its principles

This flexible and competence-oriented approach, with emphasis on learning outcomes, focuses on providing learners the best learning experience possible. Therefore, it is crucial for teachers/trainers to know how to engage their learners with the educational contents and pedagogical strategies set, promoting their interaction with teachers/trainers and with other learners in a dynamic and constructive way, which ultimately contributes for their academic achievements.

This approach has specific didactic principles which relate to four different, but interconnected, factors created by the American Psychological Association (APA, 1997)⁷, important for teachers/trainers to know:

- 1. Cognitive and Meta-Cognitive**
Connected to the nature and goals of the learning process, the process of constructing knowledge, strategic thinking, thinking about thinking and to the context of learning.
- 2. Motivational and Affective (connected to the goals of the learning process)**
Connected to motivational and emotional influences on learning, intrinsic motivations to learn and effect of motivation on effort.
- 3. Developmental and Social**
Linked to the impact individuals' development and their social interactions have on their learning.
- 4. Individual Differences**
Connected to the diversity of individuals' strategies and capabilities to learn and to the standards in place to assess their learning progress.

These principles can guide teachers/trainers to set strategies that will help their learners to adapt to this learner-centered learning environment, in accordance with their specific characteristics.

According to Mara, E.L. (2017)⁸, the Learner-Centered Approach aims at the development of learners' skills considering their personal characteristics, difficulties and achievements, tailoring the teaching methods to encourage and motivate learners to organize their own learning process and to be actively involved in its development.

Teachers/trainers assume the role of facilitators of the learning process, not just creating a suitable learning environment but also guiding learners towards seeking meaning from the materials used in

⁷ American Psychological Association, Board of Education Affairs (1997). *Learner- Centered Psychological Principals – A Framework for School Reform & Redesign*. Retrieved from <https://www.apa.org/ed/governance/bea/learner-centered.pdf>, in July 2020

⁸ Mara, E. L. (2017). *New perspective of learner-centered education in nowadays didactics*. MATEC Web of Conferences 121. Retrieved from DOI: 10.1051/matecconf/2017121, in July 2020

the learning process and integrating their knowledge with previous materials and/or experiences (McCabe, A., 2014).⁹

Hence, the focus of the Learner-Centered Approach is on learning rather than just on teaching, a paradigm shift that has significant impact on the way teachers/trainers manage the learning environment and prepare their learners for their future success as active, autonomous and responsible citizens.

However, shifting from traditional teaching practices into the Learner-Centered Approach imposes challenges to teachers/trainers as it requires preparation and collaboration from other staff and also from learners, who sometimes are reluctant to change.

Nevertheless, this approach has clear benefits both for teachers/trainers and for learners. With the Learner-Centered Approach, teachers/trainers guide learners into understanding the world around them and to think critically about what and how they learn, fostering their ability to solve problems and to make decisions.

Collaborative Learning

One of the pedagogical strategies that are part of the Learner-Centered Approach, also addressed by this CU, is collaborative learning.

This strategy aims to enhance learning by engaging learners into working together in groups to share their ideas and points of view to solve a problem and/or to learn new concepts.

Teachers/trainers can foster this interaction between groups of learners by following the necessary steps to plan a collaborative learning environment:

- Define a purpose: What collaboration skills must be acquired by learners? By defining a purpose, teachers/trainers will be able to plan what to do to achieve it.
- Promote learners' equitable work: For a collaborative working environment, it is important that learners work together by dividing their work for equal thinking opportunities, ensuring all ideas and suggestions towards a solution are taken in consideration. This will motivate them to continue working in groups.
- Assess learners' participation in working groups: It is important that teachers/trainers are aware of the interactions between learners of the same group. This will allow teachers/trainers to address issues or difficulties, provide feedback and help those in need for collaboration skills and, at the same time, improve the group dynamic.

By guiding learners in a collaborative learning environment, teachers/trainers help them to exploit the group's strengths to address its learning needs, manage time, divide a large project into smaller tasks, cooperate, resolve conflicts and reach a consensus, which are valuable skills in today's working environments.

To ensure an effective group work, teachers/trainers must carefully structure the task at hand, and clearly define learning outcomes to be achieved.

By providing constant support throughout the task, teachers/trainers help learners to work in groups and to learn the complexities of solving a problem collaboratively, thus promoting deeper learning through doing.

Problem-Based Learning

One clear task which can be implemented by teachers/trainers in a collaborative working environment is to find a solution for a specific problem related to the subject matter at hand and to real world problems. This can be done by using Problem-Based Learning (or PBL) assignments, a method addressed by this CU.

PBL uses real problems as context to allow learners to develop their thinking and problem-solving skills, as well as to obtain essential knowledge and concepts from the subject matter.

⁹ McCabe, A. (2014). *Student-Centered learning: "Letting Go", the role and responsibility of the lecturer*. Dundark Institute of Technology. Tourism and Hospitality Research in Ireland Conference – Cork Institute of Technology. Retrieved from https://www.researchgate.net/publication/273392686_Student-centred_learning_the_role_and_responsibility_of_the_lecturer, in September 2020

According to Ramadhani, R. et al. (2019)¹⁰, a PBL has several elements in education which are aligned with the above-mentioned principles of the Learner-Centered Approach. Those elements are:

- a. Integrated learning: Learners build thinking through direct experience, which comes from the fact that learners analyse the problems based on their previous experiences about the subjects addressed by those problems, as baseline for further investigation.
- b. Contextual learning: Connected to the benefits of learning from things that happen in learners' lives or in each context related to the topics being addressed in class.
- c. Constructivism learning: It relates to learning by doing. Solving a PBL requires learners to break down the problems into components in brainstorming sessions to propose possible solutions based on the required information to solve the problem.
- d. Active learning: Learners are actively involved in the learning process by determining, doing and evaluating. One of the steps of implementing a PBL relies on a plan to solve it, based on discussions, evaluations and hypothesis set by learners.
- e. Learning interest: Learners find more joy in learning if they are involved in the determination of the problems.

As previously mentioned, the implementation of a PBL has different phases that set the tone for the creation, by teachers/trainers, of PBL exercises. In a nutshell, these phases involve teachers/trainers and learners and are characterized by:

1. Submission of a problem by the teachers/trainer, in a way that requires several data/information and allows learners to think of different ways to solve it;
2. Analysis of the problem by learners, based on their previous knowledge about the subject as starting point for further investigating its issues;
3. After the analysis of the problem, the next phase is for learners to break down problems into components in a "brainstorming" session, allowing them to propose possible solutions based on the information needed to solve the problem, and how it can be obtained, which is also considered in this phase;
4. What to do next is what learners must focus on, discussing, evaluating and organising hypothesis towards a list of resources needed (human and/or material) and tasks to be carried out. This phase is characterized by the development of a plan to obtain the information needed to solve the problem;
5. After the previous phase is concluded, learners must then report and present their results, in a discussion held in the presence of other learners, describing the problem, the concepts contained in it, the work carried out by the group in the previous phases and the solutions found for the problem at hand;
6. The last phase is characterized by the development of material by teachers/trainers based on those results, to be further studied by learners.

PBL promotes a friendly working environment for teachers/learners and its impact on the learning process is measured by the benefits it brings to learners.

Overall, PBLs:

- Allow learners to apply the knowledge they already must solve the problem, making learning meaningful for them;
- Provide learners with the opportunity to think about concepts and to solve real problems related to materials presented by the teacher/trainer in class;
- Improve learners' motivation to learn and capacity to work with others in a working group environment, whilst improving their critical thinking skills.

Critical Thinking

A collaborative learning environment and the use of PBL are directly connected to another feature of the Learner-Centered Approach - Critical Thinking.

¹⁰ Ramadhani, R. et al. (2019). *Problem-Based Learning, Its usability and critical view as educational learning tools*. Journal of Gifted Education and Creativity, 6(3), pp.219-231

Teachers/trainers can promote this skill on their learners both in classroom and on online training contexts. To do so, teachers/trainers must challenge their learners to question ideas and facts and analyse them in a rational way, searching for logical connections.

No correct answer is requested; what matters is to make learners think about a given problem in a critical way.

Thus, critical thinking can be fostered by exercises rooted in the rational analysis of a given idea or argument.

Teachers/trainers provide an information (e.g., a quote) to learners and ask them to think about it in a critical way, through the following questions:

- Who said it?
- What was said?
- When was it said?
- Why was it said?
- How was it said?

These questions will allow learners to think about the importance they give to the person who provided the information, to think about the difference between facts and opinions, the importance of having all the information needed to formulate a conclusion, the context in which the information was provided, the reason behind the person's information/opinion and the mindset of that person in the moment the information was provided.

All these factors contribute to the way learners critically analyse information to reach a rational conclusion or to decide.

In addition, it is also important that learners articulate on what the most fundamental issues are when analysing a question/problem. They must be able to consider the following:

- From what point of view should I approach this problem?
- Does it make sense for me to assume this?
- From the provided data/information, may I infer this?
- What is the fundamental concept underlined?
- With what is it consistent?
- What makes this question complex?
- How could I check the accuracy of these data?
- If this is so, what else is it implied? Is this a credible source of information?

Moreover, teachers/trainers are also able to provide to their learners' specific online tools to help them presenting or organizing projects. Some examples of such tools are [LucidChart](#) or [Google Docs](#), crucial for learners' active role in their own learning process. By fostering the use of such tools in class, teachers/trainers promote their learners' ability to conceptualize, apply, analyze, synthesize and evaluate information, reaching their own conclusions.

One can say critical thinking is an empowering skill that allows learners to identify and solve complex problems, leading to their success, hence the importance of capacitating teachers/trainers to know how to foster critical thinking on their learners.

The Learner-Centered Approach and its strategies are the cornerstones of training and education that must be implemented by teachers/trainers of EWF Qualification System and educators from STEM fields. By implementing this approach/strategies, teachers/trainers will be able to help their learners develop the necessary transversal skills they need to be part of a successful future workforce.

Why is it important?

The importance of this CU is connected to the fact that teachers/trainers are faced with a transition from a traditional pedagogical approach, rooted on the development of core generic skills, into a learner-centered approach rooted on learning outcomes, in which learners can be drivers of their own learning process, whereas teachers/trainers assume the role of facilitators, guiding their learners into that process

In addition to this transition between approaches and roles in the learning process, teaching and learning methods are now different from the ones implemented by teachers/trainers in the beginning of the current century. They must consider that learners have now a different language and a different way of learning, based on the way they access and process the constant information that is provided using digital tools and social media. This reality requires teachers/trainers to apply new pedagogical methods that foster their learners' responsibility and motivation to learn and to develop knowledge and skills that, ultimately, will allow them to be active and responsible citizens and successful professionals.

These methods must be implemented by teachers/trainers having learners as the center of the learning process, which requires shifting training and education from a "trainer" to a "learner" perspective, providing emphasis not to what the teacher/trainer teaches, but on what the learner will be able to know and to do by the end of a learning process.

Therefore, CU2 focuses on capacitating teachers/trainers from EWF Qualification System and STEM educators to implement the learner-centered approach, providing them the information they need to plan a collaborative learning environment, using specific methods and tools that include Problem-Based Learning (PBL) assignments which, due to their features, allow learners to contact with real problems and solve them collaboratively, hence the importance of focusing on the features of a collaborative learning environment where teachers/trainers can challenge their learners to use their own knowledge and experience to work together towards a solution, helping them to develop their critical thinking ability in the process.

Relation with key competences development and/or with other Competence Units

Due to its broad scope and applicability, the subjects addressed by this CU can connect to all the other WELDONE CUs as they also address methods that are based on a learner-centered approach.

B. Competence Unit 2 | Workshop Session

Number of Sessions & Duration

3 sessions:

- 2 sessions with 3 hours each
- 1 session with 4 hours

List of topics to cover in the Workshop sessions

✓	Principles of Learner-Centered Didactics (LCD)
✓	Problem-Based Learning (PBL): impact on the learning process
✓	Critical Thinking (CT) and Learners' engagement with the learning process
✓	Collaborative Learning: Characteristics and benefits

Pedagogical Approach

Active learning approach, in line with WELDONE learner-centered approach, in which the trainees have a dynamic role in the teaching- learning process.

This approach is applicable to the workshop model promoted by WELDONE as it relies on activities that foster trainees' engagement and active involvement with the activities carried out during the sessions.

Each workshop session is comprised of:



- Opening: The trainer explains to trainees what the purposes of the session are, indicating the LOs of the CU to be addressed (those LOs are connected to the topics to be covered in each session).
- Mini lesson: Lecture about the topics related to the LOs set for the session.
- Work time: Hands-on activities (e.g., exercises developed for CU2) and discussions:
- Debriefing.

Required resources for Training

Material:

Computer,
Flipchart,
Markers,
Post-its,
Paper.

WELDONE Exercises | CU2

Exercise 2.1 Learner-Centered Didactics - Role Play
Objective(s): Help teachers/trainers identifying different learners' characteristics and adapting their teaching methods according to those characteristics, in line with the principles of Learner-Centered Didactics.
Operationalization: Several trainees are directly involved in the implementation of this exercise. The trainer decides on the roles that each trainee will have in the exercise, considering the need to have trainees playing the role of Teacher/Trainer and the role of Learner with a specific feature (e.g., with motivation and without motivation to learn, insecure but engaged in learning and agitated). The Teachers/Trainer will need to identify these characteristics and plan a classroom that suits each one to allow learners to develop their autonomy and motivate them to learn. Detailed information on the operationalization of this exercise can be found here .

Exercise 2.2 "True or False"
Objective(s): The purpose of the exercise is to get teachers/trainers to think about reality as it is known and to critically analyse it before answering the question "true or false". This exercise can be replicated in a real context, with their learners.
Operationalization: The trainer has a list of sentences related to real facts and ask trainees if that sentence is true or false. Those who are sceptical about the answer must look on the internet for it, to check for additional information: Detailed information on the operationalization of this exercise can be found here .

Exercise 2.3 "World Café meeting: How to ensure a learner-centered approach teaching environment?"
Objective(s): The purpose of the exercise is to promote the discussion between trainees about the best approach to implement to foster a learner-centered approach teaching environment, starting from specific questions prepared to foster a fruitful discussion.
Operationalization: This exercise requires at least three tables, and that all trainees are separated in small groups for each table. Each table has a moderator that asks specific questions to the group (previously prepared) related to aspects to consider regarding the learner centered approach, its advantages for learning and how it can be promoted in classroom with their learners. Detailed information on the operationalization and rules to carry out this World Café session can be found here .

Exercise 2.4 "Think-Pair-Chair"
Objective(s): The purpose of the exercise is to promote trainees' analysis, evaluation and synthesis abilities.
Operationalization: Trainees are separated into smaller groups.

The trainer asks a question to each group about the subject matter(s) at hand, demanding trainees to analyse the question, evaluate what must be addressed to answer to it and to synthesize the answer.

Detailed information on the operationalization of this exercise can be found [here](#).

Exercise 2.5

“Different types of Gas”

Objective(s): This is a Problem-Based Learning (PBL) exercise which purpose is the observation of macros obtained when welding with different types of shielding gas. More specifically, this exercise includes the identification of the weld characteristics associated with each type of protection gas used in welding (e.g., height and width of the weld, depths of welding, plus or minus projections of welding spatters, analysis of types of weld morphology).

Operationalization:

To conduct this PBL, it will be necessary to have 3 macros of fillet welding joints, fabricated with different types of shielding gas.

Detailed information on the steps for implementing this PBL is available [here](#).

Exercise 2.6

“Paper Tower”

Objective(s): This exercise aims to have trainees working collaboratively and to communicate with each other towards achieving the goal of the exercise, which is to build a free-standing tower out of newspaper and tape.

Operationalization:

Trainees are separated into groups of 2 or 4 elements (depending on the size of the class) and the trainer must provide them the necessary materials for building the tower – newspapers and tape. The tower must be well structured and stand still at the end of the time provided for trainees to conclude the exercise – 15 minutes.

Detailed information on the implementation of this exercise can be found [here](#).

Exercise 2.7

“Synthesize information”

Objective(s): The purpose of this exercise is that trainees work collaboratively to prepare a short presentation explaining, in their own words, the information provided during the mini lesson conducted, in a synthetic way.

Operationalization:

Trainees must work in pairs.

They will compare the notes they took during the mini-lesson and prepare a short presentation, explaining to the remaining trainees the contents of that lesson, using their own words.

Detailed information on the implementation of this exercise can be found [here](#).

Exercise 2.8

“Designing a PBL”

Objective(s): This exercise will allow trainees to put into practice what they learned regarding Problem Based Learning (PBL) assignments and how they are built, in a collaborative way. It will also foster critical thinking by having all trainees discussing about possible solutions for the created PBLs.

Operationalization:

To implement this exercise, trainees must consider the steps to create a PBL, as explained during the mini lesson. Detailed information on the implementation of this exercise can be found [here](#).

WELDONE Assessment Tools | CU2

Assessment Tool 2A “Interview”
<p>Objective(s): An interview is a brief, structured discussion between the trainer and a trainee (or group of trainees), with a specific purpose and conducted under a given environment (i.e., calm, friendly, secure) that fosters trainees’ active participation, or willingness to speak. During interviews, open-ended questions allow trainees to be creative and provide an array of possible answers, and allow trainers to understand what trainees know, feel or understand about the topics addressed by the questions.</p> <p>Operationalization: This formative assessment tool can be implemented at the end of the workshop session dedicated to the principles of Learner Centered Didactics (LCD). The replies can be provided by trainees:</p> <ol style="list-style-type: none"> a. In an anonymous way, i.e., the trainer makes the question and then asks trainees to write their reply in a paper or post it and to deliver it to the trainer. The trainer then reads each reply out loud and promotes discussion among trainees: b. In an “open” way, i.e., the trainer can ask trainees to reply to each question out loud, by providing a different answer from the previous trainee, thus ensuring all trainees reply in a constructive way. <p>For more information on the questions to be asked to trainees and on what is being assessed, please access to the tool here.</p>

Assessment Tool 2B “Essay”
<p>Objective(s): This summative assessment tool focuses on assessing trainees’ achievements in terms of CU2 Learning Outcomes:</p> <ul style="list-style-type: none"> • Use LCD strategies in classroom to adapt the learning environment to learners’ characteristics. • Create Problem-Based Learning (PBL) exercises for welding/STEM in accordance with the steps, resources and criteria needed for its implementation. • Select tools to foster Critical Thinking in learners, integrating them in the learning environment. • Plan a Collaborative Learning environment following its three-steps process to improve learners’ group dynamics. • Use Collaborative Learning experiences to promote communication and cooperation between learners. <p>Operationalization: The question for this Essay is: <i>Based on the development of the PBL (an activity conducted during the workshop), please elaborate on the following topics:</i></p> <ul style="list-style-type: none"> - <i>What were the steps and criteria you used to design the PBL;</i> - <i>How did that activity promote collaborative learning? What were the steps followed to improve the group dynamic? Would you plan the activity in another way to promote collaborative learning and, if so, how would you do it?</i>

- *To what level did the activity promoted critical thinking?*

Additional information on the operationalization of this summative assessment tool can be found [here](#).

Assessment Tool 2C “Journaling”

Objective(s):

This summative assessment tool focuses on all learning outcomes of the CU:

- Use LCD strategies in classroom to adapt the learning environment to learners’ characteristics.
- Create Problem-Based Learning (PBL) exercises for welding/STEM in accordance with the steps, resources and criteria needed for its implementation.
- Select tools to foster Critical Thinking in learners, integrating them in the learning environment.
- Plan a Collaborative Learning environment following its three-steps process to improve learners’ group dynamics.
- Use Collaborative Learning experiences to promote communication and cooperation between learners.

Operationalization:

At the end of each workshop session, trainees are asked to write in one sheet:

- The concepts addressed in the session,
- What were the skills acquired during the session regarding those concepts?
- What was the knowledge acquired during the session regarding those concepts?
- How will they implement the acquired skills/knowledge in their own classes?
- How will their acquired skills/knowledge on the concepts addressed in training improve the learning environment and foster a learner centered approach in class.
- What will be the advantages to learners?

After completing his/her assessment of each journal, the trainer must provide the trainee the results of the assessment made to the journal so that the trainee understands whether he/she achieved the LOs of CU2.

Additional information on what must be assessed by trainers with this tool can be found [here](#).

Assessment Tool 2D “Matching Quiz”

Objective(s):

This formative assessment tool focuses on the main concepts related to the matters addressed by this CU:

- Learner centered didactics approach,
- The use of Problem-Based Learning assignments in class,
- Promotion of a collaborative learning and of a critical thinking in learners.

As such, it aims to allow trainees to assess their own knowledge about those concepts and to understand what they need to further explore.

Operationalization:

This, formative assessment tool must be applied to trainees in the beginning of the third workshop session, as at that time all the above-mentioned concepts were already addressed, and there is still time to adjust the contents of the following sessions to allow trainees to acquire knowledge about those concepts.

This quiz must be done individually. Trainees are given two lists: one containing a given concept and the other containing its description or definition, which trainees must match correctly.

The trainer has the solutions, i.e., correct match between words and descriptions.
Please access the list of Concepts, to the list of Descriptions/Definitions and to the solutions, [here](#).

Assessment Tool 2E “Multiple Choice (MQC)”
<p>Objective(s): This summative assessment tool aims to assess trainees’ acquisition of all Learning Outcomes of this CU:</p> <ul style="list-style-type: none"> • Use LCD strategies in classroom to adapt the learning environment to learners’ characteristics. • Create Problem-Based Learning (PBL) exercises for welding/STEM in accordance with the steps, resources and criteria needed for its implementation. • Select tools to foster Critical Thinking in learners, integrating them in the learning environment. • Plan a Collaborative Learning environment following its three-steps process to improve learners’ group dynamics. • Use Collaborative Learning experiences to promote communication and cooperation between learners.
<p>Operationalization: This tool must be applied at the end of the last workshop session, providing trainees 45 minutes to 1 hour to complete. Each of the 10 questions has a score of 10%, and the total score must be of 80% to PASS. This assessment counts for 60% of the learner’s final grade. Please access the questions, options and solutions, here.</p>

Required resources for Examination

Material:
Flipchart
Markers
Laptop and internet connection

Competence Unit 3 | Gamification

A. Context

What is this Competence Unit about?

Gamification is the application of game design principles in non-gaming contexts to increase motivation by entertaining users.

Gamification is everywhere in the last decade:

- If an online social network (Facebook for example) asks the user to provide the missing personal data because it is on 75% in progress, this is gamification.
- If a fitness application encourages you to reach the 10.000th step and you will gain a virtual badge to share on the internet, this is gamification.
- If Duolingo, a company offering online language courses makes their students compete against each other, sets daily goals, or shows weekly progress, this is gamification.

Gamification is when games are used in a process as an element. It is crucial to understand how gamification can be used in vocational education. There are challenges to design, implement, manage, and optimize gamification strategies.

In the Gamification Competence Unit, these challenges are in focus. Our objective is that the trainee of the TOT programme will be encouraged and keen to create games or gaming environment in welding education.

To exploit the advantages of gamification we mention here a simple and powerful model coming from game designing research (Hunicke, LeBlanc and Zubek, 2004)¹¹. The model has three categories:

- **Mechanics** of a game covers the rules, boards or any environment the game takes place.
- **Dynamics** consists of all the possible actions by the players or game masters, and
- **Emotions** (or Aesthetics) generated by participating or just by observing a game.

With these three aspects (MDE model), a trainer or teacher can approach game design using common sense. The trainee of the Train of the Trainer (ToT) programme will get acquainted with developing a gamified exercise, tools or events that can be used in training situations such as developing motoric skills, memorizing materials, increase motivation in learner groups to achieve better results.

We would like to broaden the view how we see gamification: game like activities not only in classroom but in assessment or in doing homework or any kind of activities connected to the learning process. One solution using low-cost methods such as Multiplayer Classroom¹² (described below). The other way is to use computerized solutions such as mobile application driven learning solutions or virtual reality and extended reality solutions.

The virtual computer aided solutions are expensive and very different. To show all of them is beyond the possibilities of the Gamification Competence Unit, but it is very useful to know about using simulators. Gamification differs from applying games in a teaching process. However, if trainers have no willingness to consider introducing gamification, games are still useful to keep education entertaining. The short description of Multiplayer Classroom, as a comprehensive approach to Gamification is summarized below:

Fundamentals

- The core concept of Multiplayer classroom is that the class itself is the game and the classroom is the game board.

¹¹ Hunicke, R., LeBlanc, M. és Zubek, R. (2004): MDA: A Formal Approach to Game Design and Game Research. In: *Proceedings of the Challenges in Games AI Workshop, Nineteenth National Conference in Artificial Intelligence*. AAAI, San José, CA. Retrieved from <http://www.cs.northwestern.edu/~hunicke/MDA.pdf> in April 2022

¹² Lee Sheldon: *The Multiplayer Classroom – designing coursework as a game* (CRC PressTaylor & Francis Group6000 Broken Sound Parkway NW, Suite 300Boca Raton, FL 33487-2742)

- The learners in the class are Players in a multiplayer game. The teachers will be the Game Masters. Ideally, the game will run throughout the whole semester, but it may cover shorter periods or just a workshop. (This choice may depend on various factors such as timeframe for preparations, the general attitude of the school, the layout of the classrooms. Some schools may prefer to run a pilot program covering a month or a week instead of a whole semester.)
- These new concepts flip traditional roles and hierarchy and opens the door into the game world.

Motivation and Measuring achievements

- Instead of using letter grades (A, B, C ..., F) or number grades (1, 2 ... 5) to assess achievements or progress, experience points (XP-s) are used to measure achievement.
- Players only level up through the addition of XP. XP is never deducted. Doing so players are positively motivated instead of scared of downgrading. The XPs provide a solution to keep the learners in the learning process since they can be obtained each day and each workshop.
- XPs are transferred or mapped into grades at the end of the teaching period.
- The multiplayer classroom uses the language and principles of video games to engage learners. They may have Avatars for example, and they free to choose their avatar names. They may have raids; they may have Player versus Environment quests (PvE) or Player versus Player quests (PvP).
- The tasks are renamed as Quests. The quests can be done by teams renamed as 'Guilds'. Also, there are quests intended to complete by individuals ('Solo').
- Since players gather XP-s through the semester, designers of the game should provide many more different opportunities to gather XP-s than the number of opportunities to get letter grades in the traditional education. The players will have a chance to form different strategies to win (get enough XPs to complete the semester).
- Beside experience points, tokens can be used as virtual money. Tokens can be gained by exceptional achievements, completing extra quests or completing a quest remarkable faster than others. They could be the possession of the guild or an individual. These tokens can be used in different ways later in the game. Extra help (information) can be bought by tokens from other guild members or even the Game Master in completing a quest. In a challenging situation giving a few tokens to the Game Master will give extra time or can be transformed into "Health points" to survive (passing the exam). It depends on the design of Mechanics, Dynamics and Emotions.

Principles in the design process

- First, the teacher should design a game that resembles a game she or he knows and enjoys. If the trainer does not feel comfortable with the game, the whole gamification process is just a waste of time.
- When creating a teaching game, teachers and game designers should collaborate. In the progress of design, they must compromise, so that both have an opportunity to reach their goals: teaching and entertaining. A good balance should be kept between fun and learning.
- Role play games (RPGs) are a good example for a multiplayer classroom, as they do both multiplayer gameplay and storytelling.
- The multiplayer classroom must be flexible enough to give students freedom to make choices in the class if those choices don't disrupt learning.
- Since the classroom is the gameboard, it should provide flexibility: movable chairs instead of fixed tables to make zones, stages, presentations, markets.
- The planning phase requires a lot more effort at the beginning than in traditional systems and pays off later in the game part of the teaching process. In the game, players will work a lot and the Game Master just controls the process steps in and gives hints if necessary.
- Introducing new knowledge is much like when an avatar buys a new tool in a video game. The avatar learns beginner level competences in the beginning and improves step by step before the tool is used in fight or other activity. He or she must present his/her progress time to time

to get XPs and sometimes must face a challenge by an opponent (other Avatar) or the Game Master himself.

By describing the Multiplayer Classroom concept and the MDE model above we would like to help forming good and easy-to-use games in education. We would like to give a refreshment to spice up well proven training elements or give a hand to design and implement new methods to increase creativity and motivation to teach and have fun.

The curriculum covers:

- **Designing fundamentals.** Mechanics Dynamics and Emotions are used to establish a comprehensive and flexible framework. An exercise to create multiplayer classroom is also listed.
- **Application strategies in welding.** We bring exercises to demonstrate small gamification elements if receptiveness of gamification as a whole concept is low. Also, we give an exercise and a demonstration for a heavily gamified simulator solution.
- **Briefing, debriefing and giving feedback.** We embed rules of effective communication into exercises that may help teachers and trainers to maintain a positive relationship with learners.

To access these exercises and materials please follow the link: https://www.weldone-project.eu/assets/howtoget_weldone/res_cu3_gamification.html or find the corresponding exercises below.

Why is it important?

Gaming is engaging and funny. Recently, gamification is becoming increasingly popular and is widely used in various settings, such as education, industry, commerce, environment, government, and marketing.¹³ Besides the expected increase in effectiveness by gamification on these fields, gamification offers a solution for making education more interesting. Learners are getting more passive and depend too much on cellular phones. This phenomenon is remarkably described in Sir Ken Robinson's TED Talk, "Changing Education paradigms" where he highlights that "old-school" education formats cannot compete with the enormous press of the huge amount of interactive content the students consume on daily basis¹⁴.

Implementing proportions of gamified teaching and experiential learning is probably the most effective way to meet this challenge. Good gamification increases motivation that leads to an increase in performance. According to a comprehensive publication¹⁵ on gamification in education, number of studies reported positive impact on performance, however they conclude that designers and instructors ought to take into account the profiles of the learners, and mitigate resistance by learners who might have negative attitude towards gamified learning environments. Giving feedback on performance with the help of a gamified learning environment also becomes more fluent – a gamified feedback makes giving and receiving non-positive feedback more easily.

In short, gamification makes education more enjoyable and effective – if designers and instructors consider and mitigate negative attitudes that might occur.

Relation with key competences development

When compared to other competences, gamification is more adequate for the development of personal, social and learning to learn competences.

¹³ Hanus, M. D., & Fox, J. (2015). *Assessing the effects of gamification in the classroom: a longitudinal study on intrinsic motivation, social comparison, satisfaction, effort, and academic performance*, *Computers & Education*, vol. 80 (80), pp.152-161. Retrieved from <https://doi.org/10.1016/j.compedu.2014.08.019> on March 2022

¹⁴ https://www.youtube.com/watch?time_continue=1&v=zDZFcdGpL4U&feature=emb_logo

¹⁵ Meaghan C. (2015). *Lister: Gamification: The effect on student motivation and performance at the post-secondary level*. In: *Issues and Trends in Educational Technology Volume 3, Number 2*

The presence of distracting digital contents might force teachers and trainers to find new and appealing ways to keep engagement high. Gamification approaches put emphasis on tailoring the content according to different needs.

Also, it supports creating and strengthening community in classes. As in the case study ¹⁶ on a gamification of VET setting in Brazil, the trainer says: “My goal with this class is going to depend on what each of you understand, on your interests, on your knowledge and your culture, but above all, our goal must be to have your class worth it.”

B. Competence Unit 3 | Workshop Session

Number of Sessions & Duration

Three sessions with 14 contact hours
1 session: How to gamify: approx. Approx. 240 minutes.
2 sessions: Application in Welding. Approx. 240 minutes
3 sessions: Assessing, debriefing and feedbacks. Approx. 240 minutes

List of topics to cover in the Workshop sessions

✓	Introducing the MDE framework
✓	Using a game to detect and ease aversion to gamification
✓	Designing quick games from scratch
✓	Using a design syllabus to gamify
✓	A useful briefing approach
✓	Debriefing and providing feedback
✓	Examples of short games developed in welding

Pedagogical Approach

The Workshop Model is a framework that supports trainers in motivating trainees to take charge of their own learning process, becoming active and engaged in their work and development of understanding.

This model is used as the teaching model with the idea “Minimize Lecture, Maximize Learning”. The implementation is an easy to follow four step method that can be used in different education and training systems for teachers and trainers with the qualification consistent of level 5 in EQF.

The model helps to organize and schedule teachable core skills and knowledge the Competence Unit (CU) focuses on.

Trainers in CU’s are encouraged to provide and edit their content in smaller units suitable for focused **sessions** in the model. The predefined Learning Outcomes (LO) are the starting points that each session can be built up.

Our Workshop Model consists of sessions. Each session implementation is composed of four elements: Opening – Mini lesson – Work time – Debriefing.

It is supplemented with extra topics such Preparations and Helpful Hints. Our approach is also based on the principles of Experiential learning (EL) – detailed in WELDONE IO1 Training Guideline.

¹⁶ Oliveira, A.M. (2018). *Gamification as a Concrete Strategy for Teaching in a Vocational Education Setting*. Psychology, International journal for innovation education and research

Required resources for Training

Material:

Despite that gamification can be thought of as an activity that is strongly bond to computers or cellular phones, gamification is much more about learning the gamification framework. Using our creativity to learn to gamify requires only a few materials such as paper, pen, chairs, post its sticks.

Flipchart or whiteboard, projector, A4 sheets, markers and pens and pencils, empty cards with standard play cards size and weight. Specific prints according to the specific exercises (not decided yet). Flipchart or whiteboard, projector, A4 sheets, markers and pens and pencils, empty cards with standard play cards size and weight. Specific prints according to the specific exercises (not decided yet).

WELDONE Exercises | CU3

Exercise 3.1 Mechanics, Dynamics, and Emotions
Objective(s): Learning to apply Mechanics, Dynamics, and Emotions model.
Operationalization: The participants will see a photo of two female welders using electrodes. Based only this information participants will develop different game strategies to teach cooperation when welding a section of a pipe. In the planning phase they learn details of the MDE framework and challenges each other knowledge by answering questions. Click here to find the detailed exercise.
Exercise 3.2 Speedy Gonzales
Objective(s): Clarifying expectations on gamification
Operationalization: In this exercise we learn the broad definition of gamification then we formulate questions regarding gamification on a funny and quick way. The exercise may help to identify core motivating and demotivating factors. Besides that, we see MDE Framework in action. We are going to interview ourselves about our expectations towards gamification. Click here to see the full exercise.
Exercise 3.3 Briefing
Objective(s): Learn a quick and easy method of briefing.
Operationalization: In this exercise the trainees learn a 5-step method to brief straightforwardly. The exercise is short, but full of improvisation and fun. Click here for details.

Exercise 3.4 Games out of nothing
Objective(s): Learn to improvise gamified solutions quickly
Operationalization: In "Games out of nothing" we learn how to use a straightforward method to invent new gamified solutions quickly. The core elements are: Being specific, Using developing cycles repeatedly, Being fast and preferring time to finding the very best solution (small steps approach). Click here to access to more details about the exercise.

Exercise 3.5 Syllabus for gamification
Objective(s): Learning design from scratch using a syllabus.
Operationalization: "Let us suppose we have an empty green field nearby and we know there are at least 10 seniors who want to build a garden there. You do not know much about gardening neither do the seniors. You will have only one contact hour a week in 8 weeks in a row. Still, you are able to design a game that will result a nice garden with happy and very motivated builders. There are two objectives: have fun in the community and learn the basics of gardening." In this exercise trainees of the ToT programme will learn the necessary steps to design a multiplayer classroom game then they apply it in welding situations. Click here to find the exercise in the toolkit.

Exercise 3.6 Keeping travel angle: motor coordination
Objective(s): Learning the right body positions with relaxed muscles to keep travel angle at welding a horizontal seam.
Operationalization: In this exercise participants learns how to teach relaxing muscles and transferring body weight point without shaking hands. The exercise is supported a video demonstration. Please find detailed information here .

Exercise 3.7 Debriefing
Objective(s): Learn a gentle, quick method of debriefing.
Operationalization: Since gamification focuses on emotions, after a game or a quest or a task you may face people in very different sates of mind. Some are happy, some are in full of despair. It is almost certain that they are not capable to analyse what they have done and what are the areas to be developed in their skills set. Using right questions are very important in debriefing and giving feedback instead of saying what went well and what went wrong. In this exercise the trainees learn the concept of leading by questions. The exercise will focus on skills using open questions. It provides the necessary questions to conduct a good debriefing session.

Click [here](#) for details.

Exercise 3.8 Cracks in welded joints

Objective(s):

Serves as a raw material to a gamification session. Useful for Syllabus for Gamification, and Mechanics, Dynamics and Emotions exercises.

Operationalization:

This is a detailed high-quality presentation with full of useful information on welding.
More information about this exercise [here](#).

Exercise 3.9 Deviations of welded joints

Objective(s):

Best practice in developing games for collaborative thinking, improving memory.

Operationalization:

Using upside down approach to make learners to plan examination tests instead of forcing them into exams.
Details about this exercise are available [here](#).

Exercise 3.10 The essence and history of MIG-MAG welding (applied best practice – optional)

Objective(s):

Learning a gamified solutions on memorizing the units of the welding machine.

Operationalization:

Learners watch a short video on MIG MAG welding. The teacher tells additional information. Learners try to summarize what they remember. They write their result on a A3 size page on the wall. Share: After sharing their results, they correct the answers, and the teacher asks new questions to deepen their understanding.
Click [here](#) for details.

Exercise 3.11 Gamified solution to identify MMA defects

Objective(s):

Learning basic information about MMA including typical defects

Operationalization:

1) Introducing MMA
2) The trainees receive a set of photos with typical MMA defects
3) They identify the discrepancies on the photos. (2-4 trainees with one photo with rounding but not naming the defect try to figure out the reason of the defect).
Click [here](#) to find the detailed exercise in the toolkit.

Exercise 3.12 Planning Welded Joints
Objective(s): Learn to insert identification games in recognising welded joints
Operationalization: 1) Learners play a pairing game. They try to connect the names of the types with the corresponding photos. The game is played individually or in small groups. (with drawings on the first series of the photos attached to this document); 2) In new small groups the learners are given the second photo series. The trainer challenges the groups by insisting them to tell how to make the joints on the photos. For more information, please click here .

Exercise 3.13 Electricity and TIG welding
Objective(s): Basic knowledge on TIG Welding, power supplies and igniting the welding arc
Operationalization: This is an exercise what includes a raw material to be gamified. The raw material is a classic tig welding class. The raw material includes a presentation . The structure of the presentation can be used to build a gamified workshop. A short but self-explanatory description can be found here .

WELDONE Assessment Tool | CU3

Assessment tool 3.A : Debating topics

A. BACKGROUND OF THE ASSESSMENT METHOD

1) Name of the tool: Debate Assessment
2) What is the objective? 1. Make a complex assessment on a vocational skill where problem-based learning method, critical thinking, decision making, or ethics are to be taught. 2. Debates have been used effectively to stimulate interest, promote active class participation, and enhance presentation.
3) Operationalization: Debates, defined as “a formal discussion on a particular matter in a public meeting or legislative assembly, in which opposing arguments are put forward and which usually ends with a vote.” Debates can be used in core courses and in electives. They also are incorporated in core social and administrative sciences courses, for example ethics and social care. Different debate formats, live or online, individual, or team-based, and different assessments of the utility of this active learning tool have been described in the literature. In a train the trainer program, skills of complex decision making or the method of forming opinions can be assessed. Level of knowledge can be assessed too. Also, preparedness of applying different pedagogical methods to real situations can be assessed. At last, but not at least comprehensive thinking, empathy and rhetoric skills can also be assessed. Sometimes they are questions - mostly a choice between two options, sometimes they are thought provoking questions. Please find details here .

Assessment tool 3.B: Game Based assessment

A. BACKGROUND OF THE ASSESSMENT METHOD

1) Name of the tool: Game Based Assessment
2) What is the objective? 1. Make a complex assessment on a vocational skill where problem-based learning method, critical thinking, decision making is to be taught. 2. The tool should be used in teams even online. 3. Find a useful and entertaining method to assess skills
3) Operationalization: Game Based Assessment originally come from the territory of recruitment. Gamified assessments can vary from simple games examining your cognitive skills in an interactive format, to immersive job simulation experiences that analyse your personality traits. Game Based assessment is an excellent and peaceful tool in the classroom and there are funny and useful ideas on the internet. One good example is to design an escape room on a given subject. Please find details here .

ASSESSMENT TOOL 3.C

Process oriented guided learn inquiry – POGIL

1) Name of the assessment tool: Process Oriented Guided Inquiry Learning (POGIL)
2) What is the objective? 1. Promoting students' ability to learn in teams and to assess themselves .
Operationalization Process Oriented Guided Inquiry Learning (POGIL) is both a philosophy and a strategy for teaching and learning where the learners learn by assessing themselves. To support learning environment, POGIL uses learning teams, guided inquiry activities to develop understanding, questions to promote critical and analytical thinking, problem solving, reporting, metacognition, and individual responsibility. A POGIL learning activity engages students, promotes restructuring of information and knowledge, and helps students develop understanding by employing the learning cycle in guided inquiry activities. The learning cycle consists of three stages or phases: <i>exploration</i> , <i>concept invention or formation</i> , and <i>application</i> . Please find details here .

ASSESSMENT 3.D

Using Rubrics

A. BACKGROUND OF THE ASSESSMENT METHOD

Name of the Tool: Use Rubrics
Objective(s): Objective(s): Improve outcomes by assessing factors of the process of the achievement.
Operationalization: Assessing method in which a teacher observes and makes a judgment about the student's demonstration of a skill or competency in creating a product, constructing a response, or making a presentation. The emphasis is on student's ability to perform tasks by producing their own work with their knowledge and skills. Examples: singing, playing a piano, performing gymnastics, or completed paper, creating an artifact. Assessment can help us understand which students learn best under what conditions which such knowledge comes the capacity to improve the whole of their learning. Process-oriented assessment

is with the actual assessment concerned **task performance** rather than the output or product of the activity.
Please find details [here](#).

ASSESSMENT TOOL 3.E

WorldSkills Complex Assessment

A. BACKGROUND OF THE ASSESSMENT METHOD

Name of the Tool: WorldSkills Complex Assessment

Objective(s): To assess comprehensive skills such as mastering a skill on a final exam.

Operationalization: **WorldSkills**¹⁵ organizes the world championships of vocational skills and is held every two years in different parts of the world. Assessment methods used in the competition has process oriented and product-oriented parts.
WorldSkills has a unique system for designing assessment methods that provides fairness and comparability and distil and embrace a whole vocational skill in one product or process within four days. To achieve these goals the competition developed a marking system with simple rules to follow 8 steps.
Please find details [here](#).

Required resources for Examination

N.A.

Competence Unit 4 | Digital Competence and using digital resources

A. Context

What is this Competence Unit about?

People are changing. Technology is changing. Economy is changing. Society is changing. In the fourth industrial revolution, the digitalisation is one of the main pillars of the society change. All the applied and ready to apply technologies receive digital components, because of the rapid development of ICT. The involvement of ICT assures higher precisions in fabrication, higher productivity, less waste and less pollution.

The use of ICT requires digital literacy and, subsequently, digital competence from the workforce, and that has been a concern of national or international decision makers for the last two decades. And the last important European decision was to introduce into the Digital Education Action Plan, which was issued by the EU Commission: a set of recommendations on how education and training systems can make better use of innovation and digital technology and support the development of relevant digital competences needed for life and work in an age of rapid digital change. Those recommendations are specifically focused on initial education and training systems and cover schools, vocational education and training (VET) and higher education.

The concept of Digital competence covers all the necessary knowledge and skills required to give to a person the capability to operate, in specific conditions, any equipment which has digital components, to solve professional tasks. Moreover, the concept means the ability to understand and use the communication via internet, to understand and use media, to be able to search for information and select it, and to be able to use different digital tools for personal and professional improvements, as well. It should be seen as a complex compound of knowledge and skills, which is constantly transforming and continuously evolving as new technologies appear.

The digital competence can be obtained by specific education and training, in formal and non-formal systems, but requires teachers and trainers to be well trained. The new information to be taught, which is brand new for a teacher or trainer who used to discuss about the traditional technologies, forces the teacher/trainer to keep updated with the new technologies. This means that this trainer/teacher should gain new competences related to the digital transformation, equipment, technology and personnel involved in operating digital equipment.

Within the last four years, several initiatives in EU and US were adopted to set a better introduction of the teachers/trainers in the field of digital world or to update their competences with new knowledge and skills. Even with those initiatives, the pandemic situation which started in the beginning of 2020 showed that the education and training providers, at any level, were not prepared to use the digital tools in bulk. The main reasons were less than necessary digital equipment for teaching and learning and, secondly, the capability of teachers / trainers to use the digital equipment, the specific digital tools (software, simulators, Learning Management Systems, etc.) for teaching.

A direct conclusion here is that the teachers / trainers should be updated with new competences regarding the digital technologies which can be used for the teaching / training process, in specific conditions. The use of digital technology will help the teachers / trainers to learn from their own experience; moreover, they will be able to give learners greater and better learning support, while not increasing their workload overall. Technology can also facilitate the development of up to date and compelling open learning materials.

Digitally literate learners (trainers who are subjects of training sessions) learn to become independent, confident and wise users of digital technology and/or digital tools, such as:

1. **Learning Management Systems** - a virtual space that provides the platform for organizing and combining the content (which should be taught) into a sleek, intuitive learning path; it gives the opportunity to the trainers and trainees to learn, collaborate and test specific knowledge.
2. **Learning Experience Platforms** – these are interactive learning hubs that place the learner at the center of their own learning experience; they are combined with gamification, collaboration and social features that make content easy to find and use.
3. **Video Training Tools** - these training tools (video and audio-conferencing) live stream the topic to be taught using a platform that allows trainer and learners to connect. The interaction between the trainers and the learners is limited, but the learners have the possibility to ask questions and offer comments, ideas and opinions.
4. **Microlearning Platforms** - these are platforms that offer tools to facilitate the editing of contents to be taught.
5. **Mobile Tools** - mobile phones can be effective for consuming knowledge that is most relevant by enabling trainees to learn in parallel with other action (on the go by bus or train or plane, on waiting for a process or action to start or to develop, ...).
6. **Project Management and Planning Tools** – these are tools built for the organizing of the training process.
7. **Content Creation Tools** – these are tools for the elaboration of the content in specific format, offering the trainer different types of written notes, graphics, slides, templates and training videos.
8. **Content Management Tools** – these are tools which offer the trainer space and tools to manage the information to be taught (specific online datastores).
9. **Communication Tools** – e-mail, social communication application (WhatsApp, FB, LinkedIn, ...).
10. **Simulators and XR tools** – are tools which offer the trainer space and tools to manage actions in specific scenarios.

Moreover, trainers/trainers should be able to prove critical and analytical attitudes to appropriately choose the right digital tools according to specific needs raised by the training process.

CU 4 provides digital literacy education to trainers, which means an improvement of the specific competencies (knowledge, skills and attitudes) dedicated to the using of specific online and offline digital technology and digital tools to implement integrated technology practices for the improvement of the learning process.

Analysis of different and distinct teaching and training situations revealed the topics which should be updated: detailed knowledge on the digital data and on digital information, basic knowledge on the digital devices and equipment to be used in training, knowledge on the online environment and how to use in secured conditions, online and offline digital tools dedicated to learning process, digital communication and networking and digital media.

Why is it important?

This CU comes from the necessity of the educational and training system to evolve in parallel to the development of the new technologies which should be taught, and which can be used for teaching. Digitalisation is a component of the society's transformation process. The teachers/trainers work in a digital environment and there are multiple types of digital tools to be used for teaching at their disposal, collect-analyse-transmit different types of data, communicate using virtual environment and other. Due to all these, they should be able to use the digital resources and an update of their set of competences is required. Gaining the necessary digital competences according to this CU, the teacher/trainer builds own amount of knowledge and skills, amount which can easily be delivered to the students/trainees. Moreover, the teacher/trainer can recognize and access and customize and,

finally, use the main digital tools dedicated to education and training, the virtual environment in which data is simple to put in specific form, to be easily accepted by the students/trainees. The user can create its own virtual classroom, in which to act independently and with maximum benefit for the auditorium. It can use the specific digital teaching devices, which can be independent or connected via LAN or via internet to terminals which are in the possession of the learners. It can use all these digital devices and tools to send the information to a specific group of students / trainees, to receive reactions from them, to cooperate in applications and finally, to create assessment tasks to evaluate the evolution of the students / trainees.

These tools, technology and procedures can be used for any teaching method and for any strategy used to improve the competences of the students by education and training. They can be used in the conditions of having learners in the centre of the learning process, by applying experiential based learning, or problem-based learning, or laboratory-based learning or any other possible to use learning strategy.

Relation with key competences development and/or with other Competence Units

The CU offer access to the environment and tools which can be used in different teaching and learning strategies, so it connects to all ToT CUs.

B. Competence Unit 4 | Workshop Session

Number of Sessions & Duration

It is organized 3 sessions of 4 hours each, total 12 hours:

1. Session 1: Virtual environment (online and media)
2. Session 2: Data and information to communicate
3. Session 3: Digital tools for teaching and learning

List of topics to cover in the Workshop sessions

✓ Digital data and digital information
✓ Digital devices and equipment
✓ Online environment
✓ Online and offline digital tools dedicated to learning processes
✓ Digital communication and networking
✓ Digital Media

Pedagogical Approach

Each workshop will have two sections: a section of presentations based on the pro-active engagement of the participants and a section consisted in the discussion of specific study cases and problem-based learning, which will be with full participation, as well.

In the second section, the students will be organized in small groups of 3-5 persons, each group receiving a study case or a problem to solve. In the end the proposed solutions will be discussed with all participants. In the end, a short debriefing activity will be set.

Required resources for Training

Material:

- Specific sheets containing information from the teaching session,
- Specific templates for both sessions,
- Images and videos.

WELDONE Exercises | CU4

Exercise 4.1

“How to recognize a fake information and the potential risks within virtual environment”

Objective(s):

Provide information on how to evaluate an online information from the reality/possibility/probability points of view.

Provide information on how to recognize electronic threats.

Operationalization:

The evaluation will be done by inviting the trainees to comment on the risks related to their browsing on the internet for a specific topic. The comments will be divided in two parts: harmful viruses' action and returning of fake information. The trainer will take notes on the most important statements of the trainees, individually. The trainer will give the opportunity to the workgroups of 5 to organise internal discussions on the risks and to present statements of the group. The trainer will compare the individual statements with the groups' statements and conclude on the competences acquired by the trainees.

Please find details [here](#).

Exercise 4.2

“Choosing the appropriate digital tool for teaching specific information”

Objective(s):

Provide information and examples on how to compare the use and the results of using of different digital tools.

Operationalization:

The questionnaire and the assessment itself should be designed taking care of the learning activities and the competences and should cover all educational materials.

1. Improve the ability to self-assess, to optimize the teaching and training work.
2. Improve the courage and ability to identify options and to choose among options.

When designing a new assessment or revising an old one, “the most important component is to be sure there is a match between the objectives of the unit/course/lesson being assessed, the teaching / learning activities used, and the assessment tool.

Please find details [here](#).

Exercise 4.3

“How to prepare content for LMS”

Objective(s):

Provide information on the structure of an LMS.

Provide information on how to choose the information for the LMS.

Provide information on the main methods to present the information inside of a LMS.

Operationalization:

The application of STM consists of a combining the learning process with the assessment process. The learning is divided in volumes that can be individually accepted by the trainer and, after each such kind of volume of information, assessment on the evolution of learning is applied. The number of the volumes depends on the amount of information to be learned. The assessment sessions should be the same, using the same questions. Generally, the questions are related to the evolution of learning and to the method of learning, but questions related to the learned information could be, also asked. Please find details [here](#).

Exercise 4.4

“Simulators and Simulation of processes”

Objective(s):

Provide basic information on AR, VR and XR.

Provide information on the structure and functionality of a simulator.

Provide information on how to use a simulator and the simulation of a process in the teaching/ training sessions.

Operationalization:

The evaluation is related to the capability of the trainer to introduce the simulator, as digital too, within the teaching and the assessment activities, in a class. The welding simulators are digital tools offering scenarios of welding, with different processes and different kind of joints. A simulator can be introduced several times in a class if the subject to be taught is related to welding technology. The trainer will be verified if knows how to implement the simulator in specific moments of the teaching activity.

Please find details [here](#).

WELDONE Assessment Tool | CU4

Name of the Tool:

Product-oriented performance assessment

Objective(s):

Highlighting the fact that the trainee/learner is informed and understands what skills related to the recognizing and avoiding of virtual risks he must have after the implementation of the training process. Highlighting the existence of competencies of recognizing and avoiding risks when access virtual environments at the level of the trainee/learner.

Checking that the new skills created are in line with what was wanted through the training process, which is safety use of virtual environments

Operationalization:

The evaluation will be done by inviting the trainees to comment on the risks related to their browsing on the internet for a specific topic. The comments will be divided in two parts: harmful viruses' action and returning of fake information. The trainer will take notes on the most important statements of the trainees, individually. The trainer will give the opportunity to the workgroups of 5 to organise internal discussions on the risks and to present statements of the group. The trainer will compare the individual statements with the groups' statements and conclude on the competences acquired by the trainees.

Steps:

- Designing the structure and the contents for a workshop containing a micro lesson, an exercise, an analysis and conclusions.

- Delivering of the micro lesson to the participants; the contents should be focused on the using of a welding simulator as a tool for the training on specific aspects of the welding domain
 - Dividing the number of the trainees in groups of 5
 - Starting of the exercise: searching different topics on the internet; analysing the returned information; analysing the threats related to the search; potential solutions to avoid fake information and viruses; concluding on the results of analysis.
 - Using any type of browser, open the internet, as the most available digital resource of information, and search for „welding of aluminium”;
 - Each trainee is invited to comment the action from the risks point of view
 - The groups are invited to organise intrinsic discussions for 3 minutes; statements (regarding the risks related to the browsing) of the groups will be required.
- Please find details [here](#).

Name of the Tool:

Product-oriented performance assessment

Objective(s):

Highlighting the fact that the trainee/learner is informed and understands on how to use a simulator when prepares the teaching process.

Highlighting the existence of competencies of using a simulator for teaching at the level of the trainee/learner.

Checking that the obtained skills of using a simulator in a teaching process are in line with what was wanted through the training process

Operationalization:

The evaluation is related to the capability of the trainer to introduce the simulator, as digital too, within the teaching and the assessment activities, in a class. The welding simulators are digital tools offering scenarios of welding, with different processes and different kind of joints. A simulator can be introduced several times in a class if the subject to be taught is related to welding technology. The trainer will be verified if knows how to implement the simulator in specific moments of the teaching activity.

Steps:

- Designing the structure and the contents for a workshop containing a micro lesson, an exercise, an analysis and conclusions.
- Delivering of the micro lesson to the participants; the contents should be focused on the using of a welding simulator as a tool for the training on specific aspects of the welding domain
- Dividing the number of the trainees in groups of 5
- Starting of the exercise: identify in the information to be taught the elements that can be better presented by using a simulator dedicated to welding; elaborate short scenario with the information to be taught and how to involve the simulator; analysing the new system of training (which includes the simulator); concluding on the results of analysis.
- Using any subject (from the welding domain) to be taught and any type of welding simulator that can be used, design a class in which specific elements are taught by using the simulator;
- Each trainee is invited to comment the action of involving the simulator from the advantages and disadvantages (technical and economical) points of view
- The groups are invited to organise internal discussions on how to teach using the simulator, for 3 minutes; statements (regarding the involvement of the simulator within the class structure) of the groups will be required.

Please find details [here](#).

Name of the Tool:
Essay
Objective(s):
Encouraging the trainees to freely present what they learned about the use of existent digital tools dedicated to teaching and learning processes to manage training strategies and assess learners' performances. Preparing the trainees to deal with specific conditions of using specific digital tools dedicated to teaching and learning.
Operationalization:
An Essay is a presentation with declared level of detailing, in which the trainees present what they already learned about a topic: history, characteristics, processes, phenomena, Each trainee will receive the task; the task is explained Each trainee will receive the conditions; The trainees are invited to present their essays in the specified time The essays are read by the trainer and scores are provided. Please find details here .

Name of the Tool:
Matching Quiz
Objective(s):
The questionnaire and the assessment itself should be designed taking care of the learning activities and the competences and should cover all educational materials. 1. Improve the ability to self-assess, to optimize the teaching and training work. 2. Improve the courage and ability to identify options and to choose among options.
Operationalization:
When designing a new assessment or revising an old one, "the most important component is to be sure there is a match between the objectives of the unit/course/lesson being assessed, the teaching/learning activities used, and the assessment tool. identification of the available digital tools and the digital environment types that can be used to teach a specific information. Steps: - Dividing the amount of information to be taught in several modules or more, depending on the total amount of information. - Defining specific performance criteria as reference for the assessment - Starting the teaching and after each module prepare the self-assessment - Assuring that all trainees have access to appropriate digital tools for the assessment implementation (Computer, phone, applications, etc.) - Implementation of the assessment - Trainer delivers the first amount of information using 1-2 digital tools; - Trainer creates an interactive questionnaire, having enough questions to cover almost all topics presented during the learning activity. - Each question will receive a maximum number of points for the correct answers. - A minimum limit of points for passing the assessment should be set in the beginning and presented to the trainees before the assessment session; - A discussion on the results and comments on the correct answers will be done with the trainees. Each trainee is encouraged to make comments on the tools and to choose according to the best performance it might have. Please find details here .

<p>Name of the Tool: Successive Transformation Model (STM)</p>
<p>Objective(s): Assure better control of the learning process related to the use of digital resources for online and offline information. Improves the responsibility of the learner, who knows that continuous surveillance is applied.</p>
<p>Operationalization: The application of STM consists of a combining the learning process with the assessment process. The learning is divided in volumes that can be individually accepted by the trainer and, after each such kind of volume of information, assessment on the evolution of learning is applied. The number of the volumes depends on the amount of information to be learned. The assessment sessions should be the same, using the same questions. Generally, the questions are related to the evolution of learning and to the method of learning, but questions related to the learned information could be, also asked. Prepare the total information to be learned in specific amounts that can be considered independent Prepare the questions to ask Apply assessment integrated into the teaching session valueate what the student is doing wrong and orient it to correct its manner of learning Define a particular model of learning for the student and show what is it doing wrong Apply the personalized method of learning for the next amount of information to be learned. Please find details here.</p>

Required resources for Examination

<p>Material: Computer/Laptop/Tablet/Smartphone, Flipchart, Markers, Simulator, Internet connection, Paper.</p>

Competence Unit 5 | New Media Didactics: The use of social media & Micro-learning

A. Context

What is this Competence Unit about?

As the title itself says, CU5 deals with design of a new didactics appropriate for welding classes, but also for the whole STEM areas based on two pillars: social media and micro-learning. The basic objective is to have the teachers/trainers in welding and STEM areas acquiring knowledge and skills that will enable them to be equal in the teaching process with the new digital generations of learners to achieve their primary goal, leading the teaching process. Their role will change with the application of the constructivist paradigm.

The constructivist paradigm suggests that learning is accomplished best using a hands-on approach. Learners learn by experimentation, and not by being told what will happen, and are left to make their own inferences, discoveries and conclusions.

Teachers/Trainers will not be instructors, sources and transferors of knowledge anymore. Through CU5 they will acquire competences to organize the learning activities, share the learning experience and create the learning environment. The acquired competences will be directed towards satisfying the learning needs of today's generations (Gen Z) which are: fewer lectures, use of multimedia, relaxed atmosphere, cooperation with peers, informal communication and well explained objectives and assignments.

What does this mean?

This means that through CU5, the learning process will be reversed. Micro-learning will take place in the environment of social networks. It is an optimal environment in which both "digital natives" (pupils / learners) and "digital immigrants" (teachers / trainers) feel good. This environment, moreover, has great potential to reduce differences and connect these two groups through non-formal learning. In doing so, didactic design through the selection of micro-learning topics, rhythm and timing of activities will be built on the paradigm of constructivism.

By building specific links between social networks, an architecture with great possibilities for collaborative work is obtained. The didactic possibilities provided by this architecture in interactions are unlimited:

- group - teacher
- learner - teacher
- learner - learner
- teacher - teacher

And what is very important to emphasize is that the whole learning process can take place in an area of 24/7 (24 hours a day, 7 days a week), without any restrictions.

Why is it important?

We live in the Industry 4.0 era, where Internet and social media we visit have a significant impact on social development, and at the same time on development of everyone.

Social media today is an important tool for interaction among people. They enable sharing and exchanging of content of different formats, commenting, debating and creating information and knowledge. Here, it is important to mention the possibility of creating open and closed groups (interest groups) that make it possible for users to be, always, in a virtual environment that suits them most.

The abovementioned interactive tools make the communication landscape more dynamic. It is possible today, on social media, to create high quality multimedia teaching material using a whole range of apps and programs that make it easier to develop an idea.

Secondary, learning characteristics will be changed through the constructivist approach. Active instead of passive learning (absorption of knowledge), learning by research, exploration and problem solving instead of consistent reproduction and repetition of memorized facts and individualised learning. And thirdly, micro-learning and micro-training - development of teachers' competences in creation of short-targeted information that hits the point. Such information will relate to the current culture and objectives tied to achievement of relevant learning outcomes and activities. These pieces of information will make it possible for the learners to get the gist and, if they wish to do so, expand their knowledge by researching new detailed information.

A dominant paradigm in today's education are curricula models based on modules and units of learning outcomes - even in e-learning that stress the need for teaching a subject and transferring the knowledge, not creating it. In CU5, that paradigm will be changed to learning with technology. Technology as a way of thinking and learning, and consequently, as a way of creating the knowledge. Here it is important to stress out that it is perfectly clear to everybody that today's teachers were once learners in an environment where all these modern tools were not available.

On the other hand, the learners today possess much greater knowledge in using digital technologies than they are allowed to use in the classroom.

Therefore, the paradigm needs to be shifted in educational institutions. First, the education needs to be moved to the 24/7 zone, which is a comfort zone for today's learners. Teachers in educational institutions need to realize what to do with new digital technologies and possibilities of learning on social media and move from transfer of knowledge to constructivist teaching. Within this change they need to think of new ways of learning with technology and micro-learning, without having experienced it themselves. Through it, all they need to bear in mind is that the gap between what learners are able to do and what they are allowed to do in the classroom is getting bigger by the day and that it needs to be reduced as much as possible.

So, it is extremely important that teachers learn how to learn and learn how to learn in a new way using the technology. To do so, they need to have the courage, imagination, intellect and be creative.

Relation with key competences development and/or with other Competence Units

Through CU5, the teachers will have the chance to improve or acquire a new set of skills such as teamwork and communication skills, analytical skills, critical thinking and problem solving and foster creativity and intercultural skills that are part of the key competences.

All the eight key competences are intertwined in CU5, but the emphasis is definitely on competences in technology as a way of thinking and learning, i.e., learning with technology, digital competences, personal and social competences and entrepreneurship.

Only a teacher possessing such competences can meet the expectations of digital generation learners. These expectations being help in applying the information that is important to them, being competent in explaining the objectives and assignments, securing a relaxed atmosphere in the classroom and on social media with informal communication between the teacher and the learners as well as among the students themselves. In such an environment, the students will be ready to follow the set learning outcomes.

To sum up, the new didactic and micro-learning are a framework for creation of positive environment for learning with technology that have an immediate impact on all other CUs.

B. Competence Unit | Workshop Session

Number of Sessions & Duration

Session No 1 – 2 hours
Session No 2 – 4 hours
Session No 3 – 4 hours

List of topics to cover in the Workshop sessions

- | | |
|---|---|
| ✓ | Introduction to didactic design of micro teaching, training and learning in the environment of social networks. |
| ✓ | The role of social media in teaching, training and learning of welding (and in the STEM field). |
| ✓ | Micro-learning in the STEM area. |

Pedagogical Approach

An active learning approach, in line with the WELDONE student-centered approach, in which learners play a dynamic role in the teaching and learning process.
This approach is applicable to the workshop model promoted by WELDONE.
In this case, the two introductory exercises are based on the WELDONE workshop, and all other exercises on the modified workshop by introducing a micro-lesson instead of a mini lesson.

Session No 1:

Workshop model:

- opening
- mini-lesson - initial lecture
- work time - hands-on activities and discussions
- debriefing

Max. 10 learners

Session No 2 and 3:

Workshop model:

Application of flipped classroom with micro-learning on social media and constructivism with cognitive scaffolding.

The first phase - preparation of the workshop:

- opening
- mini-lesson / micro-lesson - initial lecture

Micro lesson on Facebook group 5 to 7 days beforehand. Group discussion: student - student, teacher - student, teacher - group.

Second phase – Teaching hour:

- work time - hands-on activities and discussions
- debriefing / evaluation

Max. 10 learners

Required resources for Training

Material:

Computer/Laptop/ Tablet/Smartphone
Flipchart,
Markers,
Post-its,

Paper.

WELDONE Exercises | CU5

Exercise 5.1 “Didactic potential of social networks”
Objective(s): Discover the didactic potential of social media as a quality environment for micro-learning.
Operationalization: WORKSHOP: Exploring the didactic potential of some social media (Facebook, Twitter, YouTube, etc.) Teaching hour: <ol style="list-style-type: none"> 1. opening 2. mini-lesson - initial lecture 3. work time - hands-on activities and discussions 4. Evaluation. Quiz - multiple choice questions Detailed information on the operationalization of this exercise can be found here .

Exercise 5.2 “Micro teaching, training and learning with technology”
Objective(s): Get familiar with the basics of the micro-learning with available technology.
Operationalization: WORKSHOP: Possibilities, advantages and disadvantages of micro teaching, training and learning with technology Teaching hour: <ol style="list-style-type: none"> 1. opening 2. mini-lesson - initial lecture 3. work time - hands-on activities and discussions 4. Evaluation. Quiz - multiple choice questions Detailed information on the operationalization of this exercise can be found here .

Exercise 5.3 “Popular social media and social media services. Possibility, advantages and disadvantages”
Objective(s): Get acquainted with the possibility, advantages and disadvantages of popular social media and services from the aspect of their didactic potential.
Operationalization: WORKSHOP: Ranking of social media according to their didactic potential Preparation: The teacher uploads the micro lesson to the Facebook group 5 to 7 days before the lesson. The student works on the material. In addition, the topic can be discussed in groups or individually learner - learner, teacher – learner and teacher - group. Teaching hour: <ol style="list-style-type: none"> 1. Synthesis of micro lesson preparation.

2. Work on topics. Individually, in pairs or in a group.
 3. Presentation of the topic.
 4. Evaluation. Quiz - multiple choice questions
- Detailed information on the operationalization of this exercise can be found [here](#).

Exercise 5.4 “Advanced communication tools and their capabilities”
Objective(s): Get to know and use new communication tools for quality interaction of all participants in the teaching process. Raise the quality of the teaching process.
Operationalization: WORKSHOP: Advanced communication tools Preparation: The teacher uploads the micro lesson to the Facebook group 5 to 7 days before the lesson. The student works on the material. In addition, the topic can be discussed in groups or individually learner - learner, teacher – learner and teacher - group. Teaching hour: <ol style="list-style-type: none"> 1. Synthesis of micro lesson preparation. 2. Work on topics. Individually, in pairs or in a group. 3. Presentation of the topic. 4. Evaluation. Quiz - multiple choice questions Detailed information on the operationalization of this exercise can be found here .

Exercise 5.5 “The role of teachers and trainers in a constructivist approach and work on social media”
Objective(s): To recognize the changed role of the teacher in the new didactic model. Formal and informal, personal and group communication in the classroom and on social networks. Relaxed work atmosphere. Quality and concise presentation of goals and tasks. Pragmatic application of useful information.
Operationalization: WORKSHOP: Minimum requirements for good teaching in the new didactic paradigm Preparation: The teacher uploads the micro lesson to the Facebook group 5 to 7 days before the lesson. The student works on the material. In addition, the topic can be discussed in groups or individually learner - learner, teacher – learner and teacher - group. Teaching hour: <ol style="list-style-type: none"> 1. Synthesis of micro lesson preparation. 2. Work on topics. Individually, in pairs or in a group. 3. Presentation of the topic. 4. Evaluation. Quiz - multiple choice questions Detailed information on the operationalization of this exercise can be found here .

Exercise 5.6 “Creating a didactic design for teaching, training and learning based on available online social media resources”
Objective(s): Design a didactic model using social media of your choice.
Operationalization: WORKSHOP: New didactic design of the teaching process in the environment of social media Preparation: Micro lesson on Facebook group 5 days beforehand. Group discussion: student - student, teacher - student, teacher - group. Teaching hour: <ol style="list-style-type: none"> 1. Synthesis of micro lesson preparation. 2. Work on topics. Individually, in pairs or in a group. 3. Presentation of the topic. 4. Evaluation. Quiz - multiple choice questions Detailed information on the operationalization of this exercise can be found here .

Exercise 5.7 “Flipped classroom: Main features and resources”
Objective(s): Get acquainted with the basics of flipped classroom, its features and benefits.
Operationalization: WORKSHOP: Defining a realistic framework for a flipped classroom Preparation: The teacher uploads the micro lesson to the Facebook group 5 to 7 days before the lesson. The student works on the material. In addition, the topic can be discussed in groups or individually learner - learner, teacher – learner and teacher - group. Teaching hour: <ol style="list-style-type: none"> 1. Synthesis of micro lesson preparation. 2. Work on topics. Individually, in pairs or in a group. 3. Presentation of the topic. 4. Evaluation. Quiz - multiple choice questions Detailed information on the operationalization of this exercise can be found here .

Exercise 5.8 “STEM literacy from learning to application”
Objective(s): Master a vision that allows us to evolve from focusing on learning for STEM literacy to using STEM literacy for continued learning.
Operationalization: WORKSHOP: STEM literacy. Change of outcomes from “learning to know and learning to do” to “learning to live together and learning to be”. Preparation: The teacher uploads the micro lesson to the Facebook group 5 to 7 days before the lesson. The student works on the material. In addition, the topic can be discussed in groups or individually learner - learner, teacher – learner and teacher - group. Teaching hour: <ol style="list-style-type: none"> 1. Synthesis of micro lesson preparation. 2. Work on topics. Individually, in pairs or in a group. 3. Presentation of the topic.

4. Evaluation. Quiz - multiple choice questions
Detailed information on the operationalization of this exercise can be found [here](#).

Exercise 5.9 “Three steps for quality micro teaching, training and learning”
<p>Objective(s): Create microlearning content and environment in three steps:</p> <ol style="list-style-type: none"> 1. Break down the content 2. Time the Activities 3. Focus on a Single Learning Goal <p>Learn to learn with technology</p>
<p>Operationalization: WORKSHOP: Creating a micro-lesson in three steps for a specific teaching unit. Preparation: The teacher uploads the micro lesson to the Facebook group 5 to 7 days before the lesson. The student works on the material. In addition, the topic can be discussed in groups or individually learner - learner, teacher – learner and teacher - group. Teaching hour:</p> <ol style="list-style-type: none"> 1. Synthesis of micro lesson preparation. 2. Work on topics. Individually, in pairs or in a group. 3. Presentation of the topic. 4. Evaluation. Quiz - multiple choice questions <p>Detailed information on the operationalization of this exercise can be found here.</p>

Exercise 5.10 “Micro STEM - case studies and good practice examples”
<p>Objective(s): Creating comprehensive micro-learning content in social media environment including a learning vision for STEM literacy.</p>
<p>Operationalization: WORKSHOP: Application of a new didactic model on realized case studies or examples of good practices Preparation: The teacher uploads the micro lesson to the Facebook group 5 to 7 days before the lesson. The student works on the material. In addition, the topic can be discussed in groups or individually learner - learner, teacher – learner and teacher - group. Teaching hour:</p> <ol style="list-style-type: none"> 1. Synthesis of micro lesson preparation. 2. Work on topics. Individually, in pairs or in a group. 3. Presentation of the topic. 4. Evaluation. Quiz - multiple choice questions <p>Detailed information on the operationalization of this exercise can be found here.</p>

WELDONE Assessment Tools | CU5

Assessment Tool A5 “Online quizzes – True or False/Testmoz”
<p>Objective(s): Apply this formative assessment tool aimed at gaining, refocusing and expanding students' attention. Apply the tool while working on topics of new media didactics that is imbued with micro-learning in the environment of social networks, a new pedagogical approach in STEM teaching and teaching welding. The aim is to emphasize the importance of providing quality individualized assessment and feedback to learners that will improve and maintain their engagement in the learning process. The application of quizzes in the teaching process achieves the goal of encouraging students' critical thinking and acquiring habits of innovative learning. This quiz integrates “play” into the learning process and thus helps learners understand weaker areas with instant feedback.</p> <p>Operationalization: At the end of each workshop, learners solve online quizzes. Example 1: Online quiz True or False The goal is to get feedback on the progress of each individual learner and the level of quality of the workshop.</p> <p>Procedure: 1. Design questions. 2. Access the digital tool Testmoz: https://testmoz.com/ 3. By selecting the Make a Test field, teachers and users begin to build the Test. 4. Enter and format questions. 5. Completion of test design For more information on the questions to be asked to trainees and on what is being assessed, please access to the tool here.</p>

Assessment Tool B5 Online quizzes - Multiple-Choice Questions/Testmoz
<p>Objective(s): Apply this formative assessment tool aimed at gaining, refocusing and expanding students' attention. Apply the tool while working on topics of new media didactics that is imbued with micro-learning in the environment of social networks, a new pedagogical approach in STEM teaching and teaching welding. The aim is to emphasize the importance of providing quality individualized assessment and feedback to learners that will improve and maintain their engagement in the learning process. The application of quizzes in the teaching process achieves the goal of encouraging students' critical thinking and acquiring habits of innovative learning. This quiz integrates “play” into the learning process and thus helps learners understand weaker areas with instant feedback.</p> <p>Operationalization: At the end of each workshop, learners solve online quizzes. Example 1: Multiple-Choice Questions The goal is to get feedback on the progress of each individual learner and the level of quality of the workshop.</p> <p>Procedure: 1. Design questions. 2. Access the digital tool Testmoz: https://testmoz.com/</p>

3. By selecting the Make a Test field, teachers and users begin to build the Test.
 4. Enter and format questions.
 5. Completion of test design
- For more information on the questions to be asked to trainees and on what is being assessed, please access to the tool [here](#).

Assessment Tool C5 “Online quizzes – Fill In the Blanks/Testmoz”
<p>Objective(s):</p> <p>Apply this formative assessment tool aimed at gaining, refocusing and expanding students' attention.</p> <p>Apply the tool while working on topics of new media didactics that is imbued with micro-learning in the environment of social networks, a new pedagogical approach in STEM teaching and teaching welding. The aim is to emphasize the importance of providing quality individualized assessment and feedback to learners that will improve and maintain their engagement in the learning process.</p> <p>The application of quizzes in the teaching process achieves the goal of encouraging students' critical thinking and acquiring habits of innovative learning. This quiz integrates “play” into the learning process and thus helps learners understand weaker areas with instant feedback.</p> <p>Operationalization:</p> <p>At the end of each workshop, learners solve online quizzes.</p> <p>Example 1: Fill In the Blanks</p> <p>The goal is to get feedback on the progress of each individual learner and the level of quality of the workshop.</p> <p>Procedure:</p> <ol style="list-style-type: none"> 1. Design questions. 2. Access the digital tool Testmoz: https://testmoz.com/ 3. By selecting the Make a Test field, teachers and users begin to build the Test. 4. Enter and format questions. 5. Completion of test design <p>For more information on the questions to be asked to trainees and on what is being assessed, please access to the tool here.</p>

Assessment Tool D5 “Paper: Short Answer Type Test”
<p>Objective(s):</p> <p>Assess basic knowledge and understanding of topics from STEM teaching and welding teaching before asking questions of deeper assessment on these topics,</p> <p>Assess learners' ability to integrate what they have learned in lectures, readings and discussions and how they apply this knowledge.</p> <p>Provide opportunities for learners to demonstrate higher level skills and knowledge through the ability to develop answers in a limited way.</p> <p>Operationalization:</p> <p>Design a good Short Answer Question.</p> <ul style="list-style-type: none"> - Design short answer - The content of the short answer question measures knowledge - Express the questions with clear wordings

- Consider efficient scoring
- Write the instructions
- Set the questions explicitly and precisely.
- Prepare a structured assessment sheet

For a positive assessment of the short answer paper results, it is necessary to achieve 60% correct answers

For more information on the questions to be asked to trainees and on what is being assessed, please access to the tool [here](#).

Assessment Tool E5 “Alternate method/PowerPoint”
<p>Objective(s): Assess the integrated knowledge and skills acquired by learners during STEM classes and welding classes.</p>
<p>Operationalization: The topic that will be covered for the final assessment is the Preparation of teaching hour (workshops) using the WELDONE methodology applied in the exercises for the CU course. Work out the topic in seven steps The summative assessment will verify:</p> <ul style="list-style-type: none"> - Ability for safe and critical use of information and communication technology for work on social media, in personal and social life and in communication. - Ability to analyze needs and goals, create curricula, develop resources and micro-teaching activities, implementation through learning on social media (self-learning, collaborative learning, support and management), for formative and summative evaluation of the micro-learning process. - The level of all eight key competencies (according to the EQF) of teachers will be assessed <p>For more information on the questions to be asked to trainees and on what is being assessed, please access to the tool here.</p>

Required resources for Examination

Class: group of trainees (5 to 10 trainees)
Classroom: 10 places + trainer
Trainer: Laptop/Tablet/Smartphone
Trainees: Laptop/Tablet/Smartphone

Competence Unit 6 | Personal, Social and Learning Competence

A. Context

What is this Competence Unit about?

This competence unit aims at the enhancement of strong personal, social and learning competences to make the individual able to effectively cope with the growing competition in educational and professional environments.

Since 2018, the former 'Learning to Learn' competence has been labelled by The Council of the European Union "Personal, Social, and Learning to Learn" competence. Personal, social and Learning to learn competence is defined as *"the ability to reflect upon oneself, effectively manage time and information, work with others in a constructive way, remain resilient and manage one's own learning and career"* and it is emphasized that it *"includes the ability to cope with uncertainty and complexity, learn to learn, support one's physical and emotional wellbeing, to maintain physical and mental health, and to be able to lead a health-conscious, future-oriented life, empathise and manage conflict in an inclusive and supportive context"* (Council of the European Union, 2018). It is one of the key competences for the Adult Learning Process and it addresses, above others, several transversal skills from the 2006 Framework, such as critical thinking, creativity and problem solving, as well as some new ones such as resilience, ability to deal with uncertainty and complexity (European Commission, 2018)¹⁷. The *European Framework for Personal, Social and Learning to Learn Key Competence* (LifeComp) regards "Personal, Social, and Learning to Learn" competences as applying to all spheres of life, and can be acquired through formal, informal, and non-formal education (European Commission, 2020). The three dimensions competence includes a personal aspect that involves self-awareness, physical and mental well-being, a social aspect, covering interpersonal interactions and working with others and a learning aspect, focusing on lifelong learning strategies and career management skills. Career management skills are crucial because they include self-knowledge and more specifically, the knowledge of personality traits such as interests, vocational skills, values and self-evaluation. It additionally includes the capacity to: (i) well organize a plan, (ii) engage and commit to learning, (iii) analyse information about educational and professional opportunities and making the best possible decisions.

According to the Reference Framework, that sets out eight key competences, this competence refers to the ability to reflect upon oneself, to effectively manage time and information, to work with others in a constructive way, to be resilient and manage one's own learning process and career. Additionally, according to the European Commission (2019), Personal, Social and Learning to Learn competence requires knowledge of the components of a healthy mind, body and lifestyle. It includes the knowledge of learning strategies that best suit the individual. Additionally, it is related to the understanding of one's needs in competence(s) development and thus understanding how to navigate through a variety of ways for developing competences and finding one's path in education, training and career opportunities.

Focusing on adult learning it is important to understand its relationship with the three dimensions competence: Adult learning is based on being able to work both in groups and autonomously, to self-evaluate and effectively manage one's social interactions. All these aspects are included and enhanced through the three-dimension competence.

¹⁷ European Commission (2018). *Proposal for a Council Recommendation on Key Competences for Lifelong Learning*. Commission Staff Working Document accompanying the document

Enhancing this competence will assist individuals to identify and set both professional and personal goals, to be self-motivated, resilient and more confident to pursue and succeed at the lifelong learning process throughout their lives.

Why is it important?

Personal, social and learning competence is one of the key competences for the Adult Learning Process and it addresses several transversal skills from the 2006 Framework, as well as some new ones such as resilience, ability to deal with uncertainty and complexity (European Commission, 2018). Given the focus on adult learning of the project, it is important to aim on the personal, social and learning competence since it can have great impact on the individual's both personal and professional aspects of life.

Nowadays, due to the growing competition both in educational and professional environments, there is an increasing need for individuals to enhance their personal, social and learning competences. By doing so, they can enhance their soft skills and as such to have a competitive advantage in both learning and professional environments. For example, when defining the different aspects of the personal, social and learning competence, it includes time management, emotional regulation, self-awareness and planning (on the personal aspect), effective communication, conflict management and constructive team working (on the social aspect) and learning to learn and interculturality are parts of the learning aspect. All these are prerequisites for a safe and respectful environment, both during the learning process but also for a successful professional life.

For this reason, personal social and learning competence is of a high importance in competence-based learning to make individuals capable of controlling their emotions, resolving conflicts and coexisting harmoniously during all stages of the learning process.

The link between the three aspects of the competence, personal, social and learning aspects lies in the decisive role of emotions and relationships in learning (Cefai C.; Bartolo P. A.; Cavioni V.; Downes, P.; 2017). In the context of any learning environment, the role of emotions and trusted relationships can be very crucial since they promote the smooth and successful implementation of the educational process for youngsters but also adults. The three dimensions competence is very important in the learning process because it includes a wide range of traits and as such it is cross-curricular and includes new teaching/learning and assessment approaches.

The role of Personal, Social and Learning Competence is crucial not only for the learning process but also for the whole society and economy. According to European Commission (2020) *"Personal, Social, and Learning to Learn" is intertwined with other key competences (i.e. Literacy; Multilingual; Mathematical, science, technology and engineering; Digital citizenship; Entrepreneurship; and Cultural awareness and expression); it spans relevant competences which all citizens should develop to empower them to actively participate in society and the economy, in the context of the increasing importance of 'soft skills' in a fast-changing global context"*.

Relation with key competences development and/or with other Competence Units

CU6 Personal, social and learning competences addresses several transversal skills, such as resilience, and the ability to deal with uncertainty and complexity. We can consider personal, social and learning competence to be particularly related to CU7 Entrepreneurship Competence, especially if we consider that creativity and the ability to plan and manage processes which are thought to be aspects of the three dimensions competence are also considered to be essential dimensions of an entrepreneurial mind-set. What is more, the fact that the ability to work both individually and collectively aligns both with entrepreneurship competence and personal, social and learning competence and makes us relate

to an extent the two competences. Nonetheless, this is a CU that boosts success in all other CUs of the curriculum.

B. Competence Unit | Workshop Session

Number of Sessions & Duration

The total duration of the sessions will be 11 hours and there will be implemented three sessions.

1st session: 4 hours

2nd session: 4 hours

3rd session: 3 hours

List of topics to cover in the Workshop session

✓	Personal Competence
✓	Social Competence
✓	Learning Competence

Pedagogical Approach

A **"learner-centered" approach** will be used including practices that focus on learners individually, their talents, their interests, their experiences, their background, their capabilities and needs as well as didactic practices that are most effective for high motivation, meaningful learning and success for all learners aiming to provide the basis for personal development so that learning can continue for life in a self-directed way.

During the sessions, **Group and cooperative learning strategies** will be integrated to enhance the communication and cooperative learning skills of the participants.

In the end of each session, Assessment & Evaluation tools will be provided including reflection questions, checklists, etc. to assist the self-assessment and self-reflection of individuals and motivate them for further learning.

For this specific Competence Unit, the following key competences will be addressed:

- The three dimensions of Personal, Social and Learning Competence and the main elements included in this specific concept
- Creating a positive and encouraging climate of diversity for learning.
- Engaging participants in cooperative learning and addressing social and emotional issues.
- Applying strategies, such as ice-breakers activities and introductions, to build trust among participants and to establish a positive learning environment.
- Self – awareness and Self-management techniques
- Problem solving and decision-making techniques

Required resources for Training

Material:

There will be needed printed papers of the exercises, pens, flipchart, post-it, whiteboard and board pens. Chairs should be in a circle to encourage participants to have eye contact and interact easier with one another.

WELDONE Exercises | CU6

Exercise 6.1 "Bucket List"
<p>Objective(s):</p> <p>The ultimate target is that the beneficiaries will be able to set some goals for themselves, understanding their priorities and what they really want from their lives.</p> <p>This exercise covers the following learning outcomes:</p> <ul style="list-style-type: none"> • Self-awareness and Self-management techniques • Time Management • Maintain awareness of one's own identity to foster inner balance • Critically reflect
<p>Operationalization:</p> <p>A "bucket list", is a list with things that we want to do before we die. The aim is to practice prioritizing and organization skills. It is very important for the trainers to explain to the participants that having plans can be achievable if the individuals can handle the variables money and time more efficiently within the planning process. Also, the limited leisure time is a psychological barrier that affects the management skills of the participants. Thus, if the participants pose long-terms goals, calculating and managing their time correctly, then the levels of self-confidence will increase, and the management procedure will be more understandable and achievable for them. This fourth step exercise is very important, because through this, the goal planning procedure will begin, but this time according to the requirements of daily life and adding some extra thoughts about how the individual can satisfy some of these deepest and personal needs, which sometimes are the reason why people are not happy in their daily life routine. If participants can plan their time more efficiently daily and be satisfied with their daily routines, then they will be able and more confident in posing long-term goals.</p> <p>Duration: 35-45 minutes (it depends on the number of participants)</p> <p>Detailed information on the operationalization of this exercise can be found here.</p>

Name of the Exercise 6.2 "Classroom scenarios"
<p>Objective(s):</p> <p>This problem-solving activity can bring a group together and assist the members to successfully solve a problem that may occur at their working life as teachers and trainers. By working together to solve the problem it is expected that the participants will also enhance their communication and teamworking skills as well as their planning skills. All these skills play an important role in the development of personal, social and learning to learn competence.</p> <p>This exercise covers the following learning outcomes:</p> <ul style="list-style-type: none"> • Effective Communication principles (assertiveness, active listening etc.) • Conflict Management • Building trust and teamwork in a constructive way • Expressing thoughts and emotions to build a trustful relationship
<p>Operationalization:</p> <p>This problem-solving activity can bring a group together and assist the members to successfully solve a problem that may occur in their working life as teachers and trainers. By working together to solve the problem it is expected that the participants will also enhance their communication and teamworking skills as well as their planning skills. All these skills play an important role in the development of personal, social and learning to learn competence.</p> <p>Detailed information on the operationalization of this exercise can be found here.</p>

Duration: 120 minutes

Exercise 6.3

“Define Personal Social and Learning to Learn Competences”

Objective(s):

The aim of this activity is to make participants familiar with the concept of Personal, Social and Learning to learn Competence, to gain functional and theoretical knowledge of the three dimensions of Personal, Social and Learning Competence, as well as the main elements that are included in this specific concept.

This exercise covers the following learning outcomes:

- The three dimensions of Personal, Social and Learning Competence, as well as the main elements that are included in this specific concept
- Effective Communication and teamwork

Operationalization:

By brainstorming on what comes to mind when hearing the phrase “Personal, Social and Learning to learn Competence” the participants are asked to create their own definition. The participants will explore on their own the concept of “personal, social and learning to learn competence” and its elements. It is important for the trainer to let the participants explore themselves the knowledge provided without interfering but of course any help provided during this “exploration” is welcomed.

Detailed information on the operationalization of this exercise can be found [here](#).

Duration: 60 minutes

Exercise 6.4

“Knowing my capacity”

Objective(s):

Reflecting about previous sessions and skills developed and assessing one’s performance as a trainee. Gaining self-awareness.

This exercise covers the following learning outcomes:

- Self – awareness and Self-management
- Emotional regulation
- Maintain awareness of one’s own identity to foster inner balance

Operationalization:

An assessment process gives the opportunity to reflect about previous sessions and skills developed, and to assess their own performance as trainees. This activity should be implemented individually, and, at the end, the facilitator will sum up the key points (common elements and significant remarks) of this process and present them to the plenary.

Detailed information on the operationalization of this exercise can be found [here](#).

Duration: 60 minutes

Exercise 6.5

“Learning Log”

Objective(s):

The aim is for the individuals to plan their assessed skills and reflect on their own learning.

This exercise covers the following learning outcomes:

- Learning to Learn
- Recognize the importance of lifelong learning to keep up with educational trends and personal and professional development

- Update existence knowledge while maintaining its consistency

Operationalization:

This exercise should be used to support planning for the assessed skill. It should be used to reflect on the learning that has taken place and the progress being made. It is important to explain to the participant that it is of a high significance to be consistent and not to skip writing down the activities that seen as less important, as he/she can also learn something from these ones.

Detailed information on the operationalization of this exercise can be found [here](#).

Duration: There is no specific duration. It can be used by the individual daily.

Exercise 6.6

“Resilience”

Objective(s):

The aim of this activity is for the participants to gain knowledge of the meaning of resilience and how they can increase this characteristic. They are also expected to enhance self-awareness skills by assessing their own resilience.

This exercise covers the following learning outcomes:

- Self – awareness and Self-management
- Emotional regulation
- Reflecting on acceptance of ambiguity and change to be able to deal with it
- Maintain awareness of one’s own identity to foster inner balance and stability to regulate and cope with undesirable emotions that may arise during the educational process
- Critically reflect and distance oneself from one’s own perceptions, biases, and stereotypical constructions of reality to promote an effective learning

Operationalization:

It is very important that the trainers can use this type of activity through all the training process. Especially, they can use the questionnaires every week and follow the progress of the participants. Also, they should mainly focus on the personal needs of each participant and try to create, if possible, in collaboration with them, an action plan that aims to strengthen and empower the element of resilience. Thus, every week the individual will be able to rate his/her progress and focus less or more to specific areas of her everyday routine, which must empower.

The element of resilience it’s a personality characteristic and it is very important for the trainers and the trainees to understand that its acquisition happens gradually. An evaluating exercise, which promotes self-awareness and a better understanding about the meaning of resilience aiming to promote strong personal skills.

Detailed information on the operationalization of this exercise can be found [here](#).

Duration: 1h 15 min

Exercise 6.7

“Self-management”

Objective(s):

This Challenge will help individuals think about how they can identify what they are good at, become more confident and really sell themselves to an existing or future employer.

This exercise covers the following learning outcomes:

- Self – awareness and Self-management
- Maintaining awareness of one’s own identity to foster inner balance
- Reflect and use diverse ways and methods to increase self-awareness and manage self-limiting beliefs, recognizing unconscious thinking, personal boundaries and external and internal conflicts.

Operationalization:

Self-management is an important skill in various contexts of individuals' life. Employers want staff who are confident, believe in themselves and can be trusted. During the implementation of this activity the participants recognize the things you have achieved and have had to overcome. In that way they are assisted to gain self-awareness, to believe in themselves and grow in confidence as well as to enhance their active listening skills as they need to listen carefully to their mate.

Detailed information on the operationalization of this exercise can be found [here](#).

Duration: 1h 30 min

Exercise 6.8
"Team being reliable"

Objective(s):

The aim is for the learners to think about reliability and loyalty and their importance in the classroom. The activity aims to assist in the building of a trustful relation between teacher and learners and to establish this way a strong connection that will create a positive learning environment

This exercise covers the following learning outcomes:

- Building trust and teamwork in a constructive way
- Critically reflect and distance oneself from one's own perceptions, biases, and stereotypical constructions of reality
- Self-awareness

Operationalization:

Reliability is an important factor that can affect the relationship between the trainer and the trainees and the whole learning process. This activity aims to assist both sides to realize the importance of reliability in a learning environment. It is important for the participants to realise the significance of reliability and loyalty and try to enhance these qualities in their working life as teachers and trainers to establish a positive and trustful relation with their learners.

Detailed information on the operationalization of this exercise can be found [here](#).

Duration: 60 minutes

Required resources for Examination

Material:

For the assessment tools, there will be needed printed papers of the self-assessment quiz, pens, flipchart, post-it, whiteboard and board pens to write feelings and thoughts.

WELDONE Assessment Tools | CU6

ART BASED ASSESSMENT

A. BACKGROUND OF THE ASSESSMENT METHOD

1) What is the method about (the background)?

Art can be used as a means of expression, not only for children but also for adults, enabling communication between the inner world and the outer world (French & Klein, 2012). When used as part of the assessment process, art can help individuals establish new goals, measure progress, and compare outcomes. Metaphor can be used as a way of exploring concepts and ideas that might be difficult or uncomfortable to communicate in other ways.

Based on the definition of Betts, arts-based assessment can be defined as an objective (standardised or non-standardised) measure that incorporates artistic experience or artistic materials into the assessment process. This method uses creative activities as a way of expressing thoughts, knowledge, points of view and feelings. It can assist the more introvert and shy learners to express themselves and reflect on what they have learned and how they feel about themselves (Betts D., 2006).

This assessment method can be used at all stages of a course to help the participants and facilitators to assess how the learning process is going, how participants are feeling, and what might need to change. At the beginning of a training course, for example, it can provide participants with an opportunity to express their expectations, concerns and feelings about what will be done during the course.

It can offer diverse information for the learner that can be gained by a high degree of interaction and provides the teacher/trainer with a well-rounded picture of the impact of the course for participants. As a way of exploring concepts and ideas, it can also be a good alternative to be used for learners with a higher degree of special needs who cannot be tested by traditional test methods.

2) What is the objective?

- ✓ Encourage multiple ways of expression.
- ✓ Encourage participants to share their feelings.
- ✓ Express complex ideas.
- ✓ Self-assessment through creative ways.
- ✓ Lay the ground for more in-depth discussion.

3) How to present and use it

This method is preferably to be used in groups, as it provides a more interactive way to assess the knowledge, skills and competences gained during the learning process. The teacher/trainer uses artistic ways such as music, theatre, painting, role playing, dancing, etc. to assess the impact of the course for learners and help them reflect on what they have learned and what skills they need to enhance more.

ART BASED ASSESSMENT

B. ASSESSMENT METHODS/TOOLS IN THE WORKSHOP MODEL

Competence Unit (CU)	Personal, social and learning to learn competence
Assessment type	Summative
Assessment method/tool	Art based assessment: My lyrics
Operationalisation (what is being assessed and why, how to conduct it)	<p>The aim of this assessment tool is to help learners to reflect on their learning and their feelings about the learning through a more entertaining, funny and creative way.</p> <p>Through the specific tool the following learning outcomes will be assessed:</p> <ul style="list-style-type: none"> ✓ Self – awareness ✓ Effective Communication ✓ Constructive Team working <p>Why to use it? Benefits for participants and trainers:</p> <ul style="list-style-type: none"> ✓ Encourage multiple ways of expression. ✓ Encourage participants to share their feelings. ✓ Express complex ideas. ✓ Self-assessment through creative ways. ✓ Lay the ground for more in-depth discussion. <p><u>STEP 1</u></p> <p>In pairs, the learners discuss with each other about how they feel about the course and reflect on what they think they have accomplished. Do they think they have gained self-awareness? Do</p>

	<p>they feel that they are now more able to work in teams and efficiently communicate with each other? Is it something that they would like to change or something that they feel it should have been done in a different way? They exchange points of view, and they talk about the pros and cons and how they feel about themselves after the course.</p> <p><u>STEP 2</u> After the discussion, they remain in pairs but this time they are asked individually to write down lyrics from a song that represents their thoughts and feelings about the course. They can use their phones to search for songs and lyrics.</p> <p><u>STEP 3</u> After everyone has finished, they show their pair the lyrics and they try to mix and incorporate their lyrics to create a new song. Detailed information on the operationalization of this exercise can be found here.</p>
Remarks	<p>This assessment tool can offer diverse information for the learner that can be gained by a high degree of interaction and provides the teacher/trainer with a well-rounded picture of the impact of the course for participants. Specifically, the teacher/trainer can assess:</p> <ul style="list-style-type: none"> ✓ how the learning procedure is going ✓ how participants are feeling ✓ what might need to change <p>The learners should be free to search and pick whatever lyrics they want to, and they can create combinations. Nevertheless, it is important that they should focus on the assessment of the learning process and knowledge and skills acquired.</p>

ART BASED ASSESSMENT

B. ASSESSMENT METHODS/TOOLS IN THE WORKSHOP MODEL

Competence Unit (CU)	Personal, social and learning to learn competence
Assessment type	Formative
Assessment method/tool	Art based assessment: Assessment collage
Operationalisation (what is being assessed and why, how to conduct it)	<p>This tool aims at helping participants to reflect on what they have accomplished in a more creative way. It can offer diverse information for the learner that can be gained by a high degree of interaction and provides the teacher/trainer with a well-rounded picture of the impact of the course for participants. As a way of exploring concepts and ideas, it can also be a good alternative to be used for learners with a higher degree of special needs who cannot be tested by traditional test methods.</p> <p>By this tool the following will be assessed:</p> <ul style="list-style-type: none"> ✓ Knowledge gained regarding The three dimensions of Personal, Social and Learning Competence, as well as the main elements that are included in this specific concept ✓ Reflect and use diverse ways and methods to increase self-awareness and manage self-limiting beliefs ✓ Listen actively to gain an insight into one's needs and strengths <p>Objectives:</p> <ul style="list-style-type: none"> ✓ Encourage multiple ways of expression. ✓ Encourage participants to share their feelings.

	<ul style="list-style-type: none"> ✓ Express complex ideas. ✓ Self-assessment through creative ways. ✓ Lay the ground for more in-depth discussion. <p><u>1st step:</u> The group is divided into pairs and each pair is given pages of magazines or newspapers (or both).</p> <p><u>2nd step:</u> The participants are asked to reflect for 10 minutes on the knowledge and skills they have gained during the training as well as what they would like to develop more. They discuss it with their partners.</p> <p><u>3rd step:</u> Each pair cuts images/words/sentences from the magazines/newspapers that demonstrate the knowledge and skills they have gained during the training regarding the Personal, Social and Learning to learn competence and creates a collage. They can also draw or write on it.</p> <p><u>4th step:</u> Each pair presents its collage to the whole group. They explain what they have created and what their thoughts and feelings are, and they try to connect each result to the three dimensions of the personal, social and learning to learn. For example, do they feel they have gained team working skills? They connect it to the social dimension.</p> <p><u>5th step:</u> After everyone has presented, all the collages are put together and a larger one is created, composed by the individual collages, that represents the whole group. Detailed information on the operationalization of this exercise can be found here.</p>
Remarks	The learners should be free to express themselves in any way they want to, but it is important that they should focus on the assessment of the learning process and knowledge and skills acquired. The teacher/trainer can be provided with a well-rounded picture of the impact of the course for participants.

INTERVIEW

B. ASSESSMENT METHODS/TOOLS IN THE WORKSHOP MODEL

Competence Unit (CU)	Personal, social and learning to learn competence
Assessment type	Formative
Assessment method/tool	Interview: Group Interview
Operationalisation (what is being assessed and why, how to conduct it)	<p>The interview could be defined as a brief structured discussion between the learner and the teacher or a group of learners and a teacher (Clark & Moss, 2010). Today, it is considered one of the most important methods widely used in various scientific fields to explore learner's thinking and assess learning (Dunphy, 2010).</p> <p>The interview process as opposed to the open discussion requires organization, planning and specific purpose. Based on this, the teacher/trainer should design the questions, the order in which they will be presented to the group, the management of possible reactions of the individuals and the environment in which the interview will take place (Clark & Moss, 2010). Closed ended questions activate the memory more than the thinking and</p>

	<p>judgment of the learner and they are capable of only one correct answer. Instead, open-ended questions are open to many kinds of answers.</p> <p>In any case, the trainer/teacher should be flexible, and it is important that the interview takes place in a calm environment, in a friendly atmosphere that inspires confidence, security and willingness to speak.</p> <p>The interview as an assessment tool can be used individually or with small groups. It is important that it takes place in a calm environment, in a friendly atmosphere that inspires confidence, security and willingness to speak. Open ended questions will preferably be used so that the learners can answer based on their complete knowledge, feeling, and understanding.</p> <p>Objectives:</p> <ul style="list-style-type: none"> ✓ Reflection on the learners' feelings about the learning process ✓ Assessment of the acquired theoretical and factual knowledge ✓ Realisation of the skills enhanced ✓ Expression of doubts and need for more information <p>The teacher/trainer gives the learners the questions that are listed below. Everyone needs to think and shortly write anonymously the answers in different post-it. After everyone has finished, the facilitator asks them to put the post-it on a board or a wall. The teacher/trainer reads aloud all the answers or some of them. A conversation follows.</p> <p>Open ended questions for reflection:</p> <ul style="list-style-type: none"> - What skills/knowledge did you gain during the session(s)? - Are there new skills you can learn? - If you could go back in time, what would you do differently during the sessions? - On a scale from 1 to 10, where do you think you are standing right now regarding the skills and knowledge you were expected to gain in this unit? <p>Detailed information on the operationalization of this exercise can be found here.</p>
Remarks	<p>This procedure can also be done individually with the learners, one by one, but it will be more time consuming and the dynamics of the team will not be easily seen.</p>

QUIZ

B. ASSESSMENT METHODS/TOOLS IN THE WORKSHOP MODEL

Competence Unit (CU)	Personal, social and learning to learn competence
Assessment type	Summative
Assessment method/tool	Quiz: Matching quiz
Operationalisation (what is being assessed and why, how to conduct it)	<p>Tests and quizzes are often a preferred method for a teacher/trainer because they are fast, easy, efficient, and can cover a lot of content (Suskie, 2009). It can be an extremely powerful method, easily to be used in a variety of situations aiming to provide opportunities for reflection, assessment and feedback about the knowledge gained.</p>

	<p>The knowledge of the three dimensions of Personal, Social and Learning Competence, as well as the main elements that included in this specific concept will be assessed with this tool.</p> <p>Objectives:</p> <ul style="list-style-type: none"> ✓ Assess learners' knowledge of the subject ✓ Evaluate learning progress and outcomes ✓ Evaluate the quality of work done ✓ Improve Knowledge Retention <p>This quiz should be done individually. Each learner is given two lists including words and they should match the words of the one list with the appropriate words of the other list. One word can be matched with more than one words of the other list.</p> <p>The teacher/learner can assess the knowledge gained by the learners.</p> <p>A list of key words is provided, along with a list of other words. The learner should "match" the words that correspond to each other. Detailed information on the operationalization of this exercise can be found here.</p>
Remarks	This can also be used as a self-assessment tool.

C. LINKS/ATTACHMENTS

Personal area	Digital
	Self-regulation
Social area	Problem solving
	flexibility
Learning area	empathy
	Critical thinking
	communication
	Entrepreneurship
	Resilience
	Managing learning

WRITING/ESSAY

B. ASSESSMENT METHODS/TOOLS IN THE WORKSHOP MODEL

Competence Unit (CU)	Personal, social and learning to learn competence
Assessment type	Summative
Assessment method/tool	Writing an essay
Operationalisation (what is being assessed and why, how to conduct it)	An essay assessment is an assessment method that allows the learner to prepare and write down in his/her own words an extended text regarding a theme following a question presented. This method can reveal much information about the learners' progress and the learning process as it requires them to apply what they have learned in the context of the learning unit and so the

	<p>teacher/trainer can see what has worked properly during the training and what needs to be changed.</p> <p>It is important that the question(s) given to the learner is clear, specific and connected to a specific objective or a learning outcome. Learners will be able to express freely their feelings and opinions about a specific issue and negotiate.</p> <p>Objectives:</p> <ul style="list-style-type: none"> ✓ Assess learners' knowledge of the three dimension competence- Personal, Social and Learning Competence- and its importance as far as lifelong learning is considered. ✓ Evaluate the learners' ability to come up with new ideas ✓ Work more on learners' critical thinking ✓ Evaluate the quality of work done <p>This method is to be used individually. Learners are provided with the topic of the essay written in a simple and clear language. The structure of the essay should be framed in a way that the learner will be guided about what he/she should include.</p> <p><u>Introduction</u></p> <p>The learners introduce the topic, briefly summarize the points they will make in the paragraphs that follow and state their thesis.</p> <p><u>Body paragraphs (two to three)</u></p> <p>The learners support their thesis statement with facts and arguments.</p> <p><u>Conclusion</u></p> <p>The learners summarize the points they made and bring their argument to its logical conclusion.</p> <p>The learners should individually write a sort text (approx. 400-600 words) about the following topic:</p> <p>"Nowadays, key competences have gained an increasingly attendance. Why is personal, social and learning to learn competence considered to be important for lifelong learning?"</p> <p>After everyone has finished, whoever wants to can read aloud their essay. Detailed information on the operationalization of this exercise can be found here.</p>
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Required resources for Examination

For the assessment tools, there will be needed printed papers of the self-assessment quiz, pens, flipchart, post-it, whiteboard and board pens to write feelings and thoughts.

Competence Unit 7 | Entrepreneurship Competence

A. Context

What is this Competence Unit about?

“The entrepreneurship competence is increasingly recognised as a competence for life, relevant to personal development and fulfilment and finding and progressing in employment, as well as initiating new ventures ranging from community campaigns, social enterprises to new start-up businesses.” (EntreComp 2016)

In the past, when talking about the Entrepreneurship competence, usually management skills came to our minds, although we know already that there is much more to it than that. So, in this competence unit we propose to deconstruct this idea, showing that entrepreneurship involves a wider range of abilities beyond the commercial entrepreneurship.

Entrepreneurship competence refers to the capacity to act upon opportunities and ideas, and to transform them into values for others, managing risk, uncertainty and ambiguity. It is founded upon creativity, critical thinking and problem solving, taking initiative and perseverance and the ability to work collaboratively to plan and manage projects that are of cultural, social or financial value.¹⁸ It also involves the ability to plan and manage both processes and resources. Entrepreneurship translates in understanding economics and the social and economic opportunities and challenges facing an employer, organisation or society, so real entrepreneurs are aware of ethical principles and challenges of sustainable development and have self-awareness of their own strengths and weaknesses.

It is true that entrepreneurship education evolved following this approach and now addresses an alternative path through innovative teaching methods, contents and scope, particularly promoting skills rather than specific management knowledge.

Vocational Education and Training needs creative and innovative trainers that consider themselves entrepreneurs and it should prepare a flexible and resilient work force, well equipped with the necessary skills and key competences to face the real-world challenges.

Entrepreneurial trainers/teacher have a critical role to play, as they are facilitators of learning and multipliers of ideas. They are responsible to shape learning processes and can help learners improve their entrepreneurship competence, responding to concrete learning outcomes — knowledge, skills and attitudes.

To develop the entrepreneurship competence, we believe it is required to apply active methods for engaging learners, such as problem-based learning or project-based learning and allow them to release their creativity and innovation potential, acquiring or building on hands-on and real-life learning experiences.

We hope this competence unit will constitute a further step in trainers’ understanding of key competences for lifelong learning and an inspiration for their own teaching practices, leading to the future application of in the tools and ideas presented here in their classrooms, being then able to inspire their learners to become increasingly entrepreneurs in their own learning and in their lives, to better shape both their future and personal paths.

A competence-oriented education, training and lifelong learning refers to a teaching and learning approach, that aims at developing key competences including relevant knowledge, skills and attitudes. It is learner focused and it refers to a necessity of an integrative approach of learning experiences beyond the traditional way of delivered training, it supports an educational approach focused on

¹⁸ Key Competences for Lifelong Learning, EC 2019

competencies, as it is transversal to all school subjects, thus integrating learning experiences, connecting skills, abilities and knowledge in an efficient way for a proper task performing.

This approach works naturally with independent study and with the trainer in the role of facilitator. It is best understood if compared with knowledge-based teaching and learning, which focuses on the knowledge aspect only.

Summing up, "an entrepreneurial attitude is characterised by a sense of initiative and agency, pro-activity, being forward-looking, courage and perseverance in achieving objectives. It includes a desire to motivate others and value their ideas."¹⁹ People with an entrepreneurial attitude needs to know and be conscious of ethical principles and the responsibility related to their actions, be empathetic towards others, be prepared to face some challenges of sustainable development and knowing themselves to be aware of what they can accomplish and the limitations they'll face.

Why is it important?

Confucius said: "I hear, and I forget. I see and I remember. I do and I understand."

Emphasis in the definition of entrepreneurship competence lies on the broad understanding of turning ideas into action and creating value, both as something that happens over time and that involves people and things (resources). Social, commercial and cultural processes and outcomes refer to activity that makes a positive contribution to individuals' lives and to the sustainable development of society. This contribution is also reflected in the skill of 'negotiating with others with empathy' and the attitude of help others and be conscious towards the environment. Whereas 'creativity' and 'innovation' are sometimes thought of as discrete skills (alongside risk-taking) within entrepreneurship competence, they are more accurately understood as processes that entrepreneurship skills play a part in.²⁰

A clear reinforcement was made in the Entrepreneurship key competence regarding the perception of risk as part of making informed decisions, rather than looking at the ability to take risks as a discrete skill. This comes, together with the important skill of coping with uncertainty and ambiguity, reflecting in a strengthened attitude of perseverance and a sense of initiative and agency in trainees – the latter referring to their confidence in their own capabilities.

Teachers cannot teach how to be entrepreneurial without themselves being entrepreneurial!

So, what is an entrepreneurial teacher?

Entrepreneurial teachers have a passion for teaching. They are inspirational, open-minded and confident, flexible and responsible — but also, when needed, rule-breakers. They have a good active listening ability, knowing when a new idea should be rethought or planted in the trainees' heads. They are team players and have a good network.

We consider that the entrepreneurship competence is a tool that can support citizens to be more entrepreneurial. This learning process is about developing a general set of competences applicable in all dimensions of life, which are impacted by all forms of learning, education and training, and contributes to the development of an entrepreneurial spirit, competence and behaviour.

EntreComp, the Entrepreneurship Competence Framework, recognises the opportunity to be entrepreneurial in any situation: from school curriculum to innovating in the workplace, from community initiatives to applied learning at university.

Entrepreneurship, as the capacity to not only start companies, but also to think creatively and ambitiously, is very important to be included in the daily life of trainees. It helps people from all

¹⁹ EC (2019). *Key Competences for Lifelong Learning*

²⁰ EC (2018) *Proposal for a Council Recommendation on key competences for Lifelong learning, Commission Staff Working Document*

socioeconomic backgrounds to think outside the box and nurture unconventional talents and skills. It creates opportunities, ensures social justice, instils confidence and stimulates the economy.

To inspire citizens and to help them develop an enterprising attitude, in this CU trainers are provided with a wide range of competences related to creativity and entrepreneurship, some ideas on how to transform the school environment in a place where creativity and risk-taking are encouraged, and mistakes are valued as a learning opportunity.

We have developed this unit with practical concepts to support STEM trainers in developing entrepreneurial skills. To achieve this objective, we will reflect on the design of pedagogical strategies aligned with the WELDONE way for teaching STEM topics based on a clear understanding of its strengths/advantages and weaknesses/disadvantages, to try to promote the improvement learning results. Discuss on how to embed entrepreneurship key competence in the subjects, inspiring relevant stakeholders, to get the support needed to implement the WELDONE way. Take the necessary reflection and steps to prepare an action plan to get the resources needed to turn ideas into action, selecting the material, non-material and digital resources needed to embed entrepreneurship key competence development in teaching practices.

As trainers have a central role and a strong impact on the accomplishment of learners, we want to support them in being more reflective to keep their practice under a constant review and adjust it in light of the individual needs of trainees and of the desired learning outcomes.

Relation with key competences development

Entrepreneurship as a key competence for lifelong learning is an essential part of WELDONE Competence Units. The development of an entrepreneurial mindset is very important and transversal to all the competence units of WELDONE ToT Curriculum, it can influence one's learning in a very positive way.

For a maximized experience in doing the WELDONE ToT course, we recommend firstly going through CU1 - Multiple Intelligences and Learning Styles, this is a "must do" unit, essential for a trainer to know its learners and to understand their learning interests and priorities, as well as their choices regarding learning, this acknowledgment will make trainers more able to shape their training habits and methods according to their learners' specificities. We consider that this Competence Unit works as a fundamental base for the rest of the training course, and all trainers are invited to experiment and go through this training module as a start.

Before engaging in the Entrepreneurship Competence Unit, we suggest going through CU2 - Learner Centred Didactics: Problem Based Learning, Critical Thinking and Collaborative Learning and CU6 - Personal, social and learning competence, as these units complement each other together with CU7 - Entrepreneurship competence, and will prepare trainers' mind set to take risks by promoting the use of alternative pedagogical approaches and challenge them to embed in their own educational resources the development of key competences in trainees, being then ready to go through the rest of the Competence Units of the WELDONE program.

B. Competence Unit | Workshop Session

Number of Sessions & Duration

3 sessions * 4 hours each

Session 1: Mini-lesson part I + Exercise 7.1

Session 2: Mini-lesson part II + Exercises 7.4 & 7.5

Session 3: Exercises 7.6 & 7.7

Exercises 7.2 and 7.3 are available as alternative options to Exercise 7.1.

All the assessment tools included in this section were designed to be used together, to demonstrate the operationalization of such tools and to evaluate achievement in the CU7 workshop, the indicative/suggested weight of each of them being the following:

- Ditch the numbers 10%
- Process Oriented Project 20%
- Product Oriented Project 20%
- Art 25%
- Quiz 25%

Nonetheless, there is always the option to select just a couple of these, if it is possible for trainees to demonstrate they have achieved all learning outcomes set for the CU7.

List of topics to cover in the Workshop sessions

✓	Definition of the Entrepreneurship competence
✓	Relevance of developing the Entrepreneurship competence in learners
✓	Competence oriented approach for teaching and learning
✓	What makes an entrepreneurial teacher?
✓	Practical entrepreneurial experiences – definition
✓	The 3 competence areas of the Entrepreneurship Competence Framework: Ideas & Opportunities, Resources and Into Action

Pedagogical Approach

The Workshop Model is the model adopted for the implementation of the WELDONE curriculum, thus being also the model adopted in CU7. The idea is to use short presentations at the beginning of sessions one and two and continue with the exercises prepared for the skills development – work time. Each exercise already foresees a debriefing stage at the end. Session three feeds from the two previous sessions and allows for a consolidation of the topics covered before, promoting a more advanced work and the development of the remaining skills foreseen to be developed in the CU. Using the workshop model allows teachers to be actively engaged in their own learning, working individually or in small groups.

Regarding the assessment tools prepared for this CU, the idea is not only to demonstrate their potential, but also their operationalization.

Workshop model:

- Opening
- Mini-lesson - initial lecture
- Work time - hands-on activities and discussions
- Debriefing

Required resources for Training

Material:

Templates (if applicable)
Paper sheets
Black/whiteboard
Markers, pens
Coloured pen
Post its

WELDONE Exercises | CU7

Exercise 7.1 “Designing your own EntreComp”
<p>Objective(s):</p> <p>In pairs or individually, this activity allows trainees to get a glance at EntreComp, its areas and competences. It also prompts trainees to start designing their own vision on how to use EntreComp, in the sense that they will select the competences and respective learning outcomes they see as most fit for their target groups (their own trainees) and their practice.</p> <p>Trainees will create a tailor-made version of EntreComp, develop a vision and communicate it to others, this vision being the big picture of what they think things ought to be. Once they have a vision, they’ll tell people about it and use it to lead people.</p> <p>Sharing a vision is critical, as it gives people a bigger picture of what things can be like, helping people raise their hopes and expectations and inspiring them. When people are inspired, they are more likely to work on something.</p> <p>This exercise covers the following learning outcomes:</p> <ul style="list-style-type: none"> • Recognize EntreComp Framework and its three competence areas to organize and prioritize action in an Entrepreneurship competence-oriented approach. • Discuss the need for investing time in embedding entrepreneurship key competence development in the subjects, inspiring relevant stakeholders, to get the support needed to implement the WELDONE way.
<p>Operationalization:</p> <p>This exercise will work better for people who work in the same organisation, preferably in pairs or in groups of three.</p> <p>Trainees will have to develop their own vision on how to embed entrepreneurship key competence development in their organization’s teaching practices. Afterwards, the trainer will lead trainees to reflect, write, speak and listen.</p> <p>Duration: About 2 hours</p> <p>Detailed information on the operationalization of this exercise can be found here.</p>

Exercise 7.2 “Presenting EntreComp”
<p>Objective(s):</p> <p>Trainees will learn about the competences while preparing their part, and will also learn from the other colleagues, when they present their own.</p> <p>This exercise covers the following learning outcomes:</p> <ul style="list-style-type: none"> • Recognize EntreComp Framework and its three competence areas to organize and prioritize action in an Entrepreneurship competence-oriented approach.
<p>Operationalization:</p> <p>This is a group activity that promotes teamwork and creativity in finding a strategy to present the 15 competences of EntreComp. Each group of five elements will be responsible for one of the three EntreComp areas – Ideas and Opportunities, Resources, and Into Action. Each group will have to find a coherent strategy and format to have each group member presenting a competence from the EntreComp area the group is responsible for. This will require each group to develop creative ideas, combine knowledge and resources to select one, and work together under pressure to achieve a goal.</p>

Duration: About 2h

Detailed information on the operationalization of this exercise can be found [here](#).

Exercise 7.3 “EntreComp card game”

Objective(s):

Being entrepreneurial is no longer just about being an entrepreneur. Entrepreneurial skills, including creativity, sense of initiative, understanding of risk and teamwork are skills much sought after by employers. Entrepreneurship is a key competence in the European Framework and this exercise will introduce EntreComp.

This exercise covers the following learning outcomes:

- Recognize EntreComp Framework and its three competence areas to organize and prioritize action in an Entrepreneurship competence-oriented approach

Operationalization:

This exercise has two parts: the first part will introduce the different competences, descriptors and hints within EntreComp; the second part will promote the hunting for good practices related to entrepreneurial learning.

The trainer will have to prepare card in advance, with the competences, descriptors and hints of EntreComp.

Duration: About 1h30

Detailed information on the operationalization of this exercise can be found [here](#).

Exercise 7.4 “Definition of an entrepreneurial teacher”

Objective(s):

This activity allows participants to think about the characteristics that are necessary to be an entrepreneurial teacher in the classroom. It will also allow them to be empathic and to put themselves in the “shoes” of another person (a trainee, a member of the administration board...).

This exercise covers the following learning outcomes:

- Define what makes a teacher an entrepreneurial one, recalling practical entrepreneurial teaching experiences to prove the efficacy of renewed practices.

Operationalization:

At the beginning of the exercise, the trainer will promote a discussion on the DOs and DON'Ts that make an entrepreneurial teacher. Afterwards, trainees will be divided in small groups and design a roleplay on “What makes a teacher an entrepreneurial one?” to be performed in front of the class. This exercise will finish with a group discussion.

Duration: About 2h

Detailed information on the operationalization of this exercise can be found [here](#).

Exercise 7.5 “The 6 guiding principles for teachers”

Objective(s):

Reflect on the working practices and develop new ideas on how to embed entrepreneurship key competence development in own training/teaching activity, set goals and weigh the risks and benefits of embedding entrepreneurship key competence development strategies in training.

This exercise covers the following learning outcomes:

- Define what makes a teacher an entrepreneurial one, recalling practical entrepreneurial teaching experiences to prove the efficacy of renewed practices
- Weigh the risks and benefits of embedding entrepreneurship key competence development strategies in training, reflecting on failures (own and other people's) and identifying their causes
- Set long, medium and short-term goals to embed entrepreneurship key competence development in own training/teaching activity

Operationalization:

This is a collaborative and sharing exercise that should be conducted in small groups, allowing teachers/trainers to reflect on their working practices and on how to embed entrepreneurship key competence development in their own training/teaching activity.

The exercise begins with the presentation of the six guiding principles followed by the question: "Which of the six guiding principles do you already include in your teaching?".

Duration: About 1h30

Detailed information on the operationalization of this exercise can be found [here](#).

Exercise 7.6

"Active methods of engaging learners"

Objective(s):

Learn about five active methods for engaging learners: project-based learning, active learning, independent learning, real-life situations, and challenge-based learning.

This exercise covers the following learning outcomes:

- Design pedagogical improvement strategies aligned with the WELDONE way for teaching STEM topics based on a clear understanding of its strengths/advantages and weaknesses/disadvantages, to improve learning results

Operationalization:

The class will be divided into 5 small groups and each group will research one of the five active methods of engaging learners.

This exercise should be presented to the class at the end of session 2, to allow for "homework", and continue in the beginning of session 3.

Duration: About 1h

Detailed information on the operationalization of this exercise can be found [here](#).

Exercise 7.7

"Plan EntreComp vision implementation"

Objective(s):

Learn how to make a vision concrete by describing the strategies that an organisation will use to meet its goals and objectives. In this exercise, learners will design an Action Plan to embed Entrepreneurship key competence in their organisation/practice.

This exercise covers the following learning outcomes:

- Discuss the need for investing time in embedding entrepreneurship key competence development in the subjects, inspiring relevant stakeholders, to get the support needed to implement the WELDONE way;
- Prepare an action plan to get the resources needed to turn ideas into action, selecting the material, non-material and digital resources needed;
- Define priorities in uncertain circumstances, with partial or ambiguous information deciding when it is not worth continuing with an idea;
- Set long, medium and short-term goals to embed entrepreneurship key competence development in own training/teaching activity.

Operationalization:

The group will be divided into pairs and create an Action Plan to embed Entrepreneurship key competence in their practice, with three basic types of objectives: process, behavioural and community level outcome.

With the scrip that will be provided by the facilitators, the trainees will be able to prepare an action plan composed of concrete action steps with concrete actions that address all the proposed changes.

Duration: About 2h

Detailed information on the operationalization of this exercise can be found [here](#).

WELDONE Assessment Tools | CU7

Assessment tool 7A

“Ditch the numbers”

Objective(s):

Formative and summative assessment

The **goal** of this online “journal” is to create an online debate forum linked with the course and follow the issues and discussions raised, allowing the sharing of perspectives, questions, resources, doubts, ideas, feelings about a topic, obstacles, learning experiences, etc. In this way, the teacher/trainer can use it to check what are the topics that need reinforcement, what misconceptions there might be, what is the level of understanding of students on a specific topic, who needs support, and to provide that support, resources, guidance and even answers.

If you initiate the journal by posting about the learning outcomes set for the course/class and asking trainees to rate each of the learning outcomes according to what they feel they already know or are able to do, you will be able to discover the characteristics of the trainees you will have in the class and this will give you an indication on what to focus, or on which resources to choose from the set of resources available, and also what are the learning outcomes that perhaps don't require such a big effort because students say they are already familiar/proficient.

The journal will also be used as an additional element to evaluate a student, based on the understanding and interest expressed both in the posts and comments this student publishes.

Operationalization:

We will use a closed **Facebook group** to keep this online learning journal. If you already have one, use it.

Suggestion: The day before the course starts, publish this question: “Do you think you are an entrepreneurial teacher/trainer? Why?”

After you have worked the topic of what an entrepreneurial teacher/trainer is, go back to this post and its comments and discuss it.

There are assessment criteria set to support you in the evaluation of the trainees.

Additional information on the operationalization of this assessment tool can be found [here](#).

Assessment tool 7B

“Art”

Objective(s):

Summative assessment

Can trainees demonstrate the learned concepts beautifully? Provocatively? Creatively? In a funny or silly way? Can they force a conversation about their learning just by creating something? Role play or drama can recreate real life situations with DOs and DON'Ts in a situation that either the trainer or the trainees choose to simulate.

The objective is to check if trainees can prove at least the achievement of one of the CU's learning outcomes.

Operationalization:

Trainees will have to show/prove they achieved one of the skills set for this CU – there is a specific list in the tool matching some of the learning outcomes set in this CU - through one of the different art options provided in the tool.

This assessment tool provides a list of rules and criteria for the assessment of the presentations performed by trainees. Trainees will need to comply with all the criteria to PASS this evaluation.

Clear and detailed information on the operationalization of this assessment tool can be found [here](#).

Assessment tool 7.C
“Process-Oriented Projects”

Objective(s):

Summative assessment

This assessment tool is to be applied when using the exercise “The 6 guiding principles for teachers”. Trainees’ learning will be assessed not for their outputs or products, but for the processes which the trainees underwent to arrive at the required products or outputs.

This assessment tool will be used to evaluate the following learning outcomes:

- Define what makes a teacher an entrepreneurial one, recalling practical entrepreneurial teaching experiences to prove the efficacy of renewed practices
- Weigh the risks and benefits of embedding entrepreneurship key competence development strategies in training, reflecting on failures (own and other people’s) and identifying their causes
- Set long, medium and short-term goals to embed entrepreneurship key competence development in own training/teaching activity

Operationalization:

This assessment tool indicates clearly what learning outcomes are meant to be assessed and what assessment criteria to use when evaluating trainees.

The trainer will carefully observe each student performance in the process.

Clear and detailed information on the operationalization of this assessment tool can be found [here](#).

Assessment tool 7.D
“Product Oriented Project”

Objective(s):

Summative assessment

This assessment tool is to be applied when using the exercise “Planning an EntreComp Vision Implementation” to evaluate the Plan developed by trainees.

This assessment tool will be used to evaluate the following learning outcomes:

- Define what makes a teacher an entrepreneurial one, recalling practical entrepreneurial teaching experiences to prove the efficacy of renewed practices
- Develop a vision and a strategy to embed entrepreneurship key competence development in teaching practices
- Prepare an action plan to get the resources needed to turn ideas into action, selecting the material, non-material and digital resources needed

Operationalization:

This assessment tool is to be used when implementing the exercise “Planning an EntreComp Vision Implementation” and it encompasses a grid with the criteria to evaluate the plan.

Only the final product, the Action Plan to embed Entrepreneurship key competence in trainers’ organisation/practice, will be evaluated.

Clear and detailed information on the operationalization of this assessment tool can be found [here](#).

Assessment tool 7.E “Quiz”
<p>Objective(s): Summative assessment This assessment tool is to be applied when using the exercise “Planning an EntreComp Vision Implementation” to evaluate the Plan developed by trainees. This assessment tool will be used to evaluate the following learning outcomes:</p> <ul style="list-style-type: none"> - Define what makes a teacher an entrepreneurial one, recalling practical entrepreneurial teaching experiences to prove the efficacy of renewed practices - Develop a vision and a strategy to embed entrepreneurship key competence development in teaching practices - Prepare an action plan to get the resources needed to turn ideas into action, selecting the material, non-material and digital resources needed
<p>Operationalization: This tool encompasses a quiz that constitutes an exam at the end of the Entrepreneurship workshop. It will count for 60% of the final grade of the Competence Unit. This single choice exam can be available in an online or paper version. Clear and detailed information on the operationalization of this assessment tool can be found here.</p>

Required resources for Examination

N.A.

5. Recommendations for Assessment & Evaluation

Assessment and Evaluation are very demanding, sensitive and responsible parts of a teacher's/trainer's work. Since the decisions that are important for the learner are made based on the results of assessment/evaluation, it demands a full professional integrity of the teacher/trainer and the use of objective information on learning and learner's achievements.

In education, how much a learner has succeeded in their aims can only be determined through assessment. Thus, there is a close relationship between assessment and those aims. This relationship helps to build an educational programme, assess the achievements of the programme and improve upon its effectiveness. It also provides valuable feedback on the design and the implementation of the programme.

Assessment plays an enormous role in the teaching-learning process. It helps teachers/trainers and learners to improve teaching and learning. It is a continuous process and a periodic exercise which is also part of the ToT Curriculum as an imperative moment of the implementation of the alternative approaches it promotes.

Evaluation is concerned with assessing the effectiveness of teaching, teaching strategies, methods and techniques. It provides feedback to the teachers about their teaching and the learners about their learning. In brief, evaluation is a very important requirement for the education system. It functions as quality control. And in an ideal situation, the teaching-learning process and the evaluation procedure go hand in hand.

Assessment always assumes that educational objectives have previously been identified and defined. This is the reason why teachers and trainers are expected not to lose sight of educational objectives while planning and carrying out the teaching-learning process, either in the classroom or outside it.

5.1 The assessment process and categories

In the assessment process, first step is to determine what to assess, i.e., to set down educational objectives. One should always ask the following questions:

- What kind of abilities and skills should be developed by learners when they study?
- What type of learning outcome is expected from a learner after they have undergone the teaching-learning process?

Trainers/teachers need to identify and state the objectives and while doing so, focus their attention on the final "product". Specific objectives determine the method to be employed to evaluate the learning experiences.

Assessment has several characteristics and functions, the most important being:

- A planned assessment helps a teacher/trainer deciding and developing the ways, methods, techniques of teaching.
- Assessment must diagnose the weak points in the learning programme as well as weakness of the learners.

- The aptitude, interest and intelligence are also to be recognised in each individual learner so that they can be directed accordingly.
- To discover potential abilities and aptitudes among learners.
- To motivate, to direct, to inspire and to involve the learner in the learning process.
- To reward their learning and thus to motivate them towards study.
- To give reinforcement and feedback to teacher/trainer, learners and the teaching-learning process.
- To assist in the modification and improvement of the teaching strategies and learning experiences.
- To communicate the results of progress to the learners, parents and the school.

Assessment can be classified into different categories in many ways. Depending on its purpose, we differentiate between the diagnostic, formative and summative assessment. There are also 3 approaches to assessment - assessment as learning, assessment for learning and assessment of learning. While the first two are of formative type and are carried out during the learning process, the third one is summative, i.e., it is done after the teaching process has finished:

a. Diagnostic Assessment

It is conducted to establish the quality and level of learner's previous knowledge and skills, i.e., before the education programme that is about to start. Based on the collected information, the teacher/trainer adjusts and plans the teaching/training process.

b. Formative Assessment

It is conducted during the teaching-learning process and is an inseparable part of it. Formative assessment is developmental in nature. The aim of this evaluation is to improve learner's learning and teacher's/trainer's teaching. Generally, teacher made tests are used for this purpose. The test items are prepared for limited content area. It helps to know to what extent the instructional objectives have been achieved and it provides feedback to the teacher to modify the methods and to prescribe remedial works, if needed.

Formative assessment examples:

- Impromptu quizzes or anonymous voting;
- Short comparative assessments to see how pupils are performing against their peers;
- One-minute papers on a specific subject matter;
- Lesson exit tickets to summarise what pupils have learnt -a tool that gives teachers/trainers a way to assess students' comprehension of a particular topic (more on <https://www.edutopia.org/practice/exit-tickets-checking-understanding>);
- Silent classroom polls (e.g., a free web-based tool [Poll Everywhere](#). It allows teachers to construct multiple choice and open-ended questions that can be used to pause a lecture to take a quick formative snapshot of how well the learners are understanding the material. The

questions are presented to the learners, through a web browser projected at the front of the class. Learners can respond on phones, tablets, or computers);

- Ask learners to create a visualisation or a map of what they learnt.

c. Summative Assessment

Summative assessment is used after the course completion to assign the grades. Its purpose is to evaluate learners' achievement. Generally, standardized tests are used for this purpose. The test items are prepared for the whole content area. It helps the teacher/trainer to know the effectiveness of the instructional procedure. It answers the question to which degree learners have mastered the course content.

While conducting summative assessment, one should always keep in mind assessment criteria and application of different summative assessment methods to give all learners the opportunity to showcase the acquired competences in a way that suits them best and get a fair grade.

5.2 Evaluation of the ToT course

Evaluation involves a final review of the effectiveness of the training programme. This evaluation is done by collecting data on whether the participants were satisfied with the outcome of the training program, how much they have learned from the training and are able to apply those newly gained skills at their workplace. There are different tools for the evaluation of a training programme, depending upon the kind of training conducted - in this case the ToT Course.

Evaluation acts as a check to judge the learning level. It focuses on grades and might reflect classroom components other than course content and mastery level.

Some of the benefits of the training evaluation are:

- Evaluation ensures accountability
- Feedback to the Trainer / Training - Evaluation also acts as feedback to the trainer or the facilitator and the entire training process.

There are many methods and tools available for evaluating the effectiveness of training programmes. Their usability depends on the kind of training programme that is under evaluation. Generally, most of the organisations²¹ use "Kirkpatrick's model for training evaluations" which evaluates training at four levels - reactions, learning, behaviour and results.

²¹ Andriotis, N. (2019). *How to evaluate a training program: The definitive guide to techniques & tools*. Retrieved from <https://www.talentlms.com/blog/evaluate-employee-training-program/> in November 2020

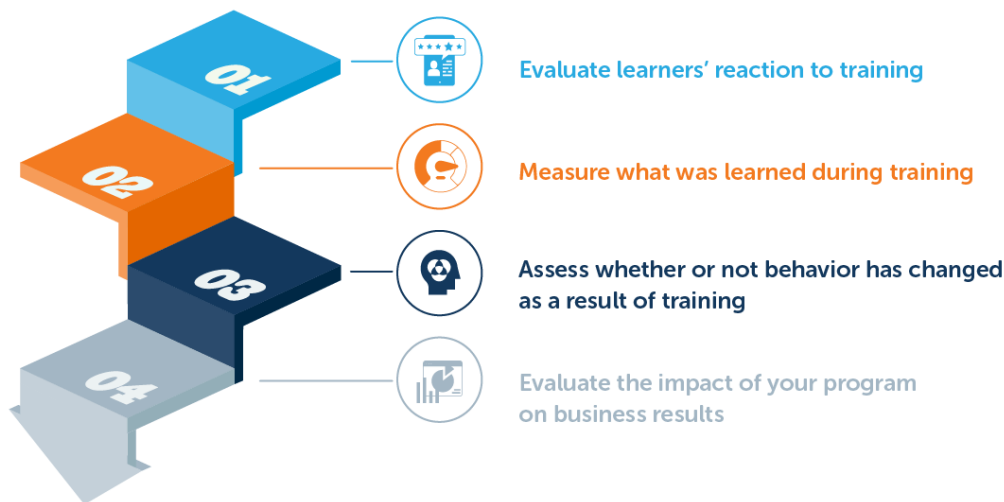


Fig. 3 Kirkpatrick's Four-level Training Evaluation Model ⁴

The four levels as described by Kirkpatrick are as follows:

1. Reaction of the Trainee - thoughts and feelings of the participants about the training
2. Learning - the increase in knowledge or understanding because of the training
3. Behaviour - extent of change in behaviour, attitude or capability
4. Results - the effect on the bottom line of the organisation because of the training.

The beauty of the model is that each level can only be predicted when the lower-level prediction is complete. Thus, evaluation at the level of behaviour may not be useful unless evaluation at the knowledge has been completed.

Whereas the four-level model works perfectly for companies, in the educational context such as the ToT Course, it is difficult to implement all the stages. Levels 1 and 2 are perfectly appropriate for this purpose, but levels 3 and 4 are barely possible to evaluate after such a short training programme such as this one.

Level 1 - Reaction

Reaction implies how favourably the participants have responded to the training. This evaluation is primarily quantitative in nature and is feedback to the training and the trainer. The most common collection tool is the questionnaire that analyses the trainer, methodology, facilities and the course content.

You want people to feel that training is valuable. Measuring how engaged they were, how actively they contributed, and how they reacted to the training helps you to understand how well they received it.

It also enables you to make improvements to future programs, by identifying important topics that might have been missing.

Identify how you want to measure people's reactions. Many people use trainee satisfaction surveys to do this. Analyse the feedback and consider the changes that you could make in response.

Level 2 - Learning

At the level of learning, the evaluation is done based on change in the ASK (Attitudes, skills and knowledge) of the trainees. The evaluation involves observation and analysis of the voice, behaviour, text.

Other tools used apart from the observation are interviews, surveys, pre and post-tests, etc. that have been previously mentioned in section 5.1. under Assessment.

Level 2 focuses on measuring what your trainees have and haven't learned. In the "New World" version of the Kirkpatrick's model, Level 2 also measures what they think they'll be able to do differently as a result, how confident they are that they can do it, and how motivated they are to make changes.

This demonstrates how training has developed their skills, attitudes and knowledge, as well as their confidence and commitment.

To measure how much your trainees have learned, start by identifying what you want to evaluate. Training sessions should have specific learning objectives, so make those your starting point.

You can measure learning in different ways, depending on the objectives, but it's helpful to measure these areas both before and after training.

Before the training begins, test your trainees to determine their knowledge, skill levels and attitudes. Then, when the training is finished, test your trainees a second time to measure what they have learned.

There are many other models that are unique in their own ways, but as mentioned earlier, the Kirkpatrick Model is the one that is accepted and used widely across all industries and with wider applications.

Learning experience

One measure of training effectiveness that's often overlooked, even when using the best types of training evaluation methods, is the learning experience. Why does this matter? Because when the learning experience is poor, trainees are less likely to engage with training content, which means that they're less likely to learn the skills that will make them better at their jobs.

So, be sure to measure trainees' perceptions of training delivery and content. Their feedback could be one of the best ways to measure training effectiveness, offering the best tips for improving your training.

The ToT course will be evaluated using a questionnaire consisting of three parts. Part 1 will cover the previous knowledge of all the partners taking part in the training sessions. Part 2 is to cover the learning aspect of the training, and Part 3 will showcase the general satisfaction of the participants.

Questionnaire

1. Previous knowledge of the partners participating in the workshops on the topics covered in the 7 CUs

- How knowledgeable were you regarding the topics covered in the specific CUs before the training sessions? (list all the CUs and mark the levels 1 - 5)

2. Learning

- How would you rate your knowledge regarding the topics covered in the specific CUs after the training sessions? (list all the CUs and mark the levels 1 - 5)
- What are the most important things that you have learned from this training?
- In which CUs did you make the most progress?
- From what you have learned, what do you plan to apply in your job?
- What do you think you'll be able to do differently because of what you have learned?
- How confident are you that you can do it?
- How motivated are you to make changes?
- What support might you need to apply what you learned?

3. General satisfaction

- Did you feel that the training was worth your time?
- Did you think that it was successful?
- What were the biggest strengths and weaknesses of the training?
- Did the training sessions accommodate your personal learning styles?
- Were the training activities engaging?
- What would you do differently?

WELDONE Assessment Methods

The change of mindset fostered by WELDONE requires alternative assessment methods which are key for a reformed performance assessment strategy, one that can allow trainees to assess their learners considering the Learning Outcomes to be achieved and to see assessment as an opportunity for learners to learn.

Only by having this perspective of assessment can it be considered a more positive aspect of the learning process and a chance to learners to show what they have learned in that process.

The following assessment methods were the basis for WELDONE partners to design and develop the formative and summative Assessment Tools to be used in the implementation of each CU of the ToT Curriculum (please see section 4 of this document).

The description of each assessment method addressed by WELDONE is provided below, focusing on:

- a. The background of the assessment method;
- b. What is its objective(s)?
- c. How to present and use that method.

Thus, the provided descriptions of the assessment methods addressed by WELDONE allow to contextualize the assessment tools prepared by the project's partners for each CU of the ToT Curriculum and to understand the importance of considering these alternative assessment methods for the success of the training and learning processes.

Paper/Online Quizzes

1) What is the method about (the background)?

Online assessment is one of the newer methods of examination and testing knowledge. The basic prerequisite for online testing is the use of a computer network for learners to access digitally designed tests and tasks for testing, solving and submitting papers via a web browser (according to Richter, 2006).

After the completed activities and submission of works, they are evaluated and processed with an automated approach. Richter (2006) concludes that online testing, like any other, should be valid, purposeful, reliable, accurate, objective, and designed according to expected learning outcomes.

Online quizzes are an integral part of online assessment. Their advantages include:

- Automatic correction;
- Establishing a permanent database with questions;
- Ongoing interactivity - instant feedback to the learner;
- Easy delivery of different versions as needed to each learner (random selection of questions);
- The possibility of changing not only the order of the questions, but also the order of the answers in each question.

Online quizzes are composed of many different types of question. The most used types of online quizzes are:

- Multiple-Choice Questions,
- True or False,
- Fill-In-The-Blanks.

Traditional exams and papers are already a somewhat outdated way of assessing knowledge and skills. Instead, Indiana University Bloomington - Center for Innovative Teaching and Learning proposes very acceptable alternatives organized based on the type of cognitive processes and skills required.

2) What is the objective?

- Evaluation of learners' knowledge - the teacher receives feedback information on student performance
- Assistance to learners in learning - learners receive feedback on how much they have learned the material using tests or quizzes for self-assessment
- Provide help learners assess their progress and identify areas for development
- Provide scalable solutions for assessment at scale.
- Checking the prior knowledge of the learner - before the start of learning, the teacher can implement a test that assesses the prior knowledge of learners.

The goal of alternative methods is to focus exactly on the skills and knowledge that the assessment should contain. The questions that will help us in this, are:

- Do you want to assess your learners' acquisition of specific content knowledge, or their ability to apply that knowledge to new situations (or both)?
- Do you want to assess a product that learners produce, or the process they went through to produce it, or both?
- Do you want to assess any of the following?
 - writing ability
 - speaking skills
 - creativity
 - use of information technology
- Is a visual component to the assessment necessary or desirable?
- Is the ability for learners to work in a group an important component of the assessment?
- Is it important that the assessment be time-constrained?

3) How to present and use it

This assessment method can be used for formative and summative assessment.

Formative assessment with online quizzes is used and presented through:

- Automated feedback on individual progress of value to both learners and teachers, and
- Opportunities to challenge learners to engage and interact with what they are learning

Summative assessment with online quizzes is used and presented through:

- flexible ways for learners to demonstrate their learning, and
- automated marking and grading at scale.

Alternative methods to multiple choice exams that can be used in many disciplines and contexts:

Alternatives that draw on learners' creativity:

- Advertisement
- Development of a product or proposal (perhaps to be judged by external judges)
- Diary entry for a real or fictional character
- Letter to a friend explaining a problem or concept
- Brochure
- Performance: e.g., a presentation to the class or a debate
- Poem, play, or dialogue
- Web page or video
- Work of art, music, architecture, sculpture, etc.
- Newspaper article or editorial

Alternatives that require analysis or evaluation:

- Analysis and response to a case study

- Analysis of data or a graph
 - Analysis of an event, performance, or work of art
 - Chart, graph, or diagram with explanation
 - Debate
 - Legal brief
 - Review of a book, play, performance, etc.
 - Literature review
 - Policy memo or executive summary
 - Diagram, table, chart, or visual aid
- Alternatives that require work like what is required for a term paper, but that result in shorter documents:
- Annotated bibliography
 - Introduction to a research paper or essay (rather than the full paper)
 - Literature review
 - Executive summary
 - Research proposal addressed to a granting agency
 - Scientific abstract
 - Policy memo or executive summary
 - Start of a term paper (the thesis statement and a detailed outline)
- Alternatives that require only those learners understand course material:
- Explanation of a multiple-choice answer (learners must explain why the answer they chose to a multiple-choice question is correct, or why the alternative answers are wrong)
 - Meaningful paragraph (given a list of specific terms, learners must use the terms in a paragraph that demonstrates that they understand the terms and their interconnections)
 - Short-answer exam (rather than asking multiple-choice questions, make some questions short-answer, to require learners to show their understanding of key concepts)
- Alternatives that require integration of many skills and types of knowledge:
- Poster (which could be presented to the class or a larger audience in a poster session)
 - Portfolio to demonstrate improvement or evolution of work and thinking over time
 - PowerPoint presentation
 - Reflection by learners on what they have learned from an experience

Process-Oriented Projects

1) What is the method about (the background)?

Process-oriented performance assessment is the way in which the person carrying out the evaluation process focuses on the activity or process of providing a service creating an output.

The two aspects, related to the performance of the implementation of the product development process and the intrinsic performance of that production process are in the focus. The result of the process may or may be not relevant in the evaluation depending on the nature of the skills or activity under assessment.

Process oriented assessment is a way that is concerned with criteria that demonstrates decisions during the learning or artmaking process, including material choice, engagement, innovation, and collaboration.

Process oriented assessment can be summative or formative.

Summative Assessment: The goal of summative assessment is to *evaluate student learning* at the end of an instructional unit by comparing it against some standard or benchmark.

Formative Assessment: Assessment that is concerned with gauging student understanding before, during, and sometimes after a lesson/unit to revise material before the lesson/unit is complete.

2) What is the objective?

Process oriented projects deals with designing criteria that evaluates decisions during the learning or artmaking process, including material choice, engagement, innovation, and collaboration. Its objective to present appropriate feedback - based on the criteria that gives relevant information to the learners to improve their skills or knowledge.

Process oriented Assessment can also help us understand which students learn best under what conditions to improve these conditions.

3) How to present and use it

As a general approach, the following 3 steps are necessary:

1. Identifying activities that would highlight the competencies to be evaluated.
2. Select appropriate activities that would entail the same sets of competencies.
3. Making sure, the activities would be interesting and enjoyable for the learners.

We offer five strategies to design a process-oriented project depending on the nature of the skills or knowledge to be assessed.

1. Using rubrics with predefined observable behaviour (such as paying attention to make a regular cleaning when working in a kitchen or in an artmaking workshop, etc.)
2. Using formal challenges such as preparing a debate on a hot topic (such as business ethics in negotiating with clients)
3. Teaching self-assessment through a collaboration teaching method that defines specific roles (leader, monitor, facilitator and evaluator) to assess collaboration.
4. Game based assessment wherein you design a game to assess a skill or a characteristic such as willingness to take risk by a game blowing balloons. We describe how to design escape rooms to observe teamwork and communication skills.
5. Skills assessing models used in the international skills competition called WorldSkills for very complex and comprehensive detailed assessment.

Interviews

1) What is the method about (the background)?

The word assessment carries a lot of baggage and can cause anxiety in both teachers/trainers and learners. However, the assessment doesn't have to be viewed in that way. One way to reframe the narrative of assessment is to use the conversational skills of educators to check for learner understanding. In fact, a conversation is often the best tool for doing that.

What is an Interview?

Interviewing involves the interaction in which the teacher/trainer collects information from learners with a sequence of questions and listens for answers. This kind of interaction can be a rich source of information to inform the teacher/trainer about how the learners understand concepts and use procedures they learned from the course and provides valuable information and directions for the teacher/trainer in modifying the course for improvements.

Structure of an Interview

Interviews are usually done face-to-face. There are two main types: Structured and Unstructured interviews.

Structured interviews are composed of a series of well-chosen questions which are designed to elicit a portrait of a learner's understanding about a concept or set of related concepts. To explore the topic more deeply, probe questions are commonly used to follow up those pre-planned 'main' questions. These probe questions are usually not formally designed ahead of the interview. Probe questions are usually formed according to the responses and answers given by the learner. Variations of structured interviews include Instances Interviews, Prediction Interviews, Sorting Interviews, Problem Solving Interviews etc.

Unstructured interviews are used when the teacher/trainer wants to let the learner have complete control over the content of the interview. The teacher/trainer usually prepares one or two questions to start off the interview. Only probe questions would then be used for the rest of the interview for further elaboration on a topic.

There are, however, other types of interviews that can be used in the teaching process to elicit feedback from learners. Casual chats with learners in the classroom can help them feel at ease even as you get a sense of what they know, and teachers/trainers often find that five-minute interview assessments work well. Five minutes per learner would take quite a bit of time, but it is not necessary to talk to every learner about every project or lesson.

It is also possible to shift some of this work to learners using a peer-feedback process called TAG feedback (Tell your peer something they did well, Ask a thoughtful question, Give a positive suggestion). When you have learners share the feedback they have for a peer, you gain insight into both students' learning.

2) What is the objective?

Advantages of an Interview

- In-depth information - In contrast to the set of fixed questions used in surveys, interviews allow the probing of deeper information from the learner, asking for elaboration and examples, discovering new relationships, and the teacher/trainer can modify questions as the interview proceeds.
- Rapport and trust – Good interviewers can establish rapport and trust with the interviewee, which can also elicit more honest and more sensitive information than surveys.
- Level of understanding by learners - Structured interviews enable teachers/trainers to examine the degree of understanding a learner has for a concept or closely related group of concepts, and to focus on how their instruction is interpreted and internalized by the learner.
- Guides improvement - When well-administered, interviews can be a powerful type of formative assessment to guide improvement in courses and teaching methods, as well as enabling teachers/trainers to understand the typical difficulties faced by learners in the course.

Disadvantages of an Interview

- Time consuming - Every interview would need to take approximately 30 to 90 minutes to finish. Also, as the nature and quality of probe questions and follow-up questions will determine the usefulness of the interview, teachers/trainers must take a certain amount of time planning and designing an informative interview.
- Bias from interviewers -It is possible that sometimes the interviewers might somewhat bias the nature of the interview data and thus the results, through their verbal and nonverbal reactions, and their choice of probe questions when interacting with learners during the interviews.

3) How to present and use it:

How to design a good Interview Assessment?

1. Try to make the learner feel relaxed and comfortable during the interview, because interviews can generate the most fruitful sharing when a trustful rapport is established.
2. Practicing can help to ensure that the interview can be finished in a reasonable amount of time (normally less than an hour).
3. Carefully select the sample of learners for interview so that the group can represent all learners who may have different levels of interest and ability.
4. Ensure all the necessary equipment for the interview are well-prepared, such as interview protocol, recording equipment, etc.
5. Try to make the interview group as small as possible or conduct it individually; this can best facilitate in-depth sharing of ideas.
6. Allow enough time for the learners to fully express their ideas; always wait for a few seconds before proceeding to the next question.

Marking Rubrics

1. Understanding of concepts of the student, misconceptions
2. Know how students can apply their knowledge in problem solving
3. Obtain feedback for improving teaching

Writing

1) What is the method about (the background)?

Writing assessment method focuses on assessing the way trainees present and idea or argument in written. An example of written test is the Essay.

An Essay is a type of formal and organised composition that allows the trainees to write, in their own words, a free and extended response to a question or a task provided by the trainers (directly connected to the intended Learning Outcomes to be acquired by trainees), by:

- Thinking about the question or task provided;
- Deciding on the response to provide;
- Convincing the trainer about the response provided by presenting it, supported by evidence on the research done.

Writing assessment methods are usually considered subjective, as there is usually an array of possible responses, hence the need to set specific assessment criteria, connected to the intended learning outcomes set for the training course (in terms of knowledge and skills).

2) What is the objective?

Writing/Essay assessment method allows to collect information on trainees' depth of learning (i.e., it is connected to Bloom's Taxonomy, which refers to the classification of different objectives that trainers set for trainees' learning, focused on specific domains – incl. Cognitive domain).

It can demonstrate trainees' level of understanding of the taught materials. It is a very time-consuming method, both for trainees (to write) and to trainers (to score), and it is also a subjective form of assessment.

However, it allows for the materialization of thoughts on paper, allows to organise, summarise and structure ideas, it allows to explore trainees' ability to read, interpret the provided instructions and to write accordingly.

Writing also promotes research, creative thinking and writing skills and, as such, it is also an important method of assessment.

3) How to present and use it:

To Trainers:

To **prepare an Essay**, trainers are requested to:

1. Select the intended Learning Outcomes that can be assessed through an Essay;
2. Request trainees to focus on hypothetical data, solve sample problems or compare concepts;
3. Phrase the Essay questions in a clear way to allow trainees to identify what is expected from their response;
4. Indicate the value of the question(s) and time suggested to reply to it;
5. Prevent the use of few questions involving long responses (long responses are difficult to assess).

To **assess an Essay** response, trainers must:

1. Previously decide on which factors will be considered in evaluating the responses, using a marking scheme;
2. Value only the significant and relevant aspects of the responses;
3. Apply uniform standards to all papers;
4. Hide the identity of the trainee to avoid the "halo effect";

5. Grade one question at the time for all papers, to minimise the halo effect, using the marking scheme.

To Trainees:

Regardless of the type of essay, its structure usually consists of:

- a. Introduction/Purposes, focused on the presentation of the subject or topic at hand, thus providing general information about the main points to be addressed by the Essay;
- b. Most important points and ideas, explained and summarised, i.e., body of the Essay with further elaboration of the main topics addressed in the Introduction part of the Essay;
- c. Results or other related points/ issues (depending on the topic of the essay), a summary of all ideas stated in the body of the Essay.

Art

1) What is the method about (the background)?

Art can be used as a means of expression, not only for children but also for adults, enabling communication between the inner world and the outer world (French & Klein, 2012). When used as part of the assessment process, art can help individuals establish new goals, measure progress, and compare outcomes. Metaphor can be used as a way of exploring concepts and ideas that might be difficult or uncomfortable to communicate in other ways.

Based on the definition of Betts, arts-based assessment can be defined as an objective (standardised or non-standardised) measure that incorporates artistic experience or artistic materials into the assessment process. This method uses creative activities as a way of expressing thoughts, knowledge, points of view and feelings. It can assist the more introvert and shy learners to express themselves and reflect on what they have learned and how they feel about themselves (Betts D., 2006).

This assessment method can be used at all stages of a course to help the participants and facilitators to assess how the learning process is going, how participants are feeling, and what might need to change. At the beginning of a training course, for example, it can provide participants with an opportunity to express their expectations, concerns and feelings about what will be done during the course.

It can offer diverse information for the learner that can be gained by a high degree of interaction and provides the teacher/trainer with a well-rounded picture of the impact of the course for participants. As a way of exploring concepts and ideas, it can also be a good alternative to be used for learners with a higher degree of special needs who cannot be tested by traditional test methods.

2) What is the objective?

- ✓ Encourage multiple ways of expression.
- ✓ Encourage participants to share their feelings.
- ✓ Express complex ideas.
- ✓ Self-assessment through creative ways.
- ✓ Lay the ground for more in-depth discussion.

3) How to present and use it:

This method is preferably to be used in groups, as it provides a more interactive way to assess the knowledge, skills and competences gained during the learning process. The teacher/trainer uses artistic ways such as music, theatre, painting, role playing, dancing, etc. to assess the impact of the course for learners and help them reflect on what they have learned and what skills they need to enhance more.

Ditch the Numbers

1) What is the method about (the background)?

Trainers don't have to use only points to grade their trainees.

Keeping a running journal online of the work learners are doing on each of the learning targets and having trainers adding their own feedback into the conversation can act as records of learners' achievements, which can even help in future jobs application and admission.

As traditional education sets are changing worldwide, and current and future careers are dependent on strong digital skills, blogging – or simply communicating online - helps learners develop necessary skills for the modern world. It is a creative and fun way for formative assessment, as you can follow more closely the issues that arise in the classroom and even the discussions raised in that online communication platform, and you can also use it as an additional element to evaluate a student, based on the understanding and interest expressed both in the post and comments this student publishes.

A blog (a shortened version of “weblog”) is an online journal or informational website displaying information in reverse chronological order, with the latest posts appearing first, at the top. It is a platform where a writer or a group of writers share their views on an individual subject. Blogs help grow learning communities by allowing students to share their own perspectives and experiences while learning about those of their classmates. Blog writing is informal, unlike academic writing, which may be intimidating to some, if not all, of your students.

2) What is the objective?

For teachers:

- Teachers can use online journals - or blogs - to publish assignments, resources, and keep students up to date on class events, due dates, and content being covered.
- Teachers can use blogs as a diary of the work learners are doing on each of the learning targets.
- Teachers can use blogs to help students master content and improve their writing skills.
- Teachers can use a blog to promote autonomous learning by providing opportunities for students to take more control of their learning, motivating students to become better readers and writers, and promoting discussion among students.

For students:

- Students can use the blog to share their own perspectives and experiences while learning about those of their classmates.
- Students can use the blog to explore their feelings about a topic. While it is often an educational topic, the students still know others will read it. The fact that they are providing information to others will give them a need to create good information since it opens them to criticism.
- Students can use blogs to publish their writing and educate others on a particular topic.

3) How to present and use it:

You may decide to use a dedicated blog platform to create your blog, but there is other platforms and tools that works as well, such a Facebook group, which you can already have in your school or that you can create specifically for that class.

First, it is important to develop clear goals, guidelines, and expectations for you and your students and everyone needs to know the rules right from the start. It is also required to obtain a written permission from the students to use their photos.

Comments are the way for students to share thoughts and opinions about the published content. You should provide some guidance on the “dos and don'ts” of commenting. Start by writing the first two or three posts and have students comment according to criteria you set. For example, encourage students to contribute with comments about their opinion on the post (or the situation referred to in the post) but don't allow discouraging put downs and inappropriate language. In this sense, you will have to monitor posts and comments and provide feedback.

Start off in the class with a post focusing on one topic, and then encourage students to comment on it under your supervision.

Set a goal of a post every two weeks per student, for longer courses, or every day, in short courses, for example.

Explain to students that plagiarism is not acceptable and that their contributions must be their own work. Don't post copyrighted images – provide a good source for free images, like unsplash.com, for instance.

Here are some topics to give ideas and get you started:

The learning outcomes set for this class

What we have tried /What was our approach

What we have learned /What went well and what we could improve

What we will keep

Don't forget start by creating the first posts and ask students to comment, but then prompt them to do their own posts.

Good luck!

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