PR8 Report and Guide for Best Practices

LATEST

Local-focused AgTech Education for Successful Ag Transitions

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Content

Task 8.1 Research and Comparative Analysis on Institutional Capacity, Teaching Strategy and Assessment, Micro Credentials, Quality Assurance, Legal Framework and National Regulations

Content

Introduction

BOKU provides research and comparative analysis and conducts a report on:

- Institutional capacity among the project partner institutions,
- Teaching strategies and assessment at the project partner institutions,
- Micro credentials and quality assurance,
- Legal framework and national regulations

The collected information serves for designing a Guide – PR 8.2, share of best practice, an overview of micro credential status in EU and abroad and designing a Guide for micro credential development – PR 9.2.

Methodology

In line with the PR5 analysis and collected data on partner´s infrastructural equipment, digital platforms and software PR 8.1 reports data on digital tools, flipped classroom and e-learning teaching methods. Regarding stackability and transparency of micro credentials, BOKU analyses EU approach on micro credentials and international practices. This information provides an overview and increases the potential to combine micro credentials with traditional programmes. The analysis follows relevant initiatives, projects and micro credential strategy examples:

- The MICROBOL project (Micro-credentials linked to the Bologna key commitments) supports ministries and stakeholders in exploring, within the Bologna Process, whether and how the existing Bologna tools can be used and/or need to be adapted to be applicable to micro-credentials
- MicroHE aims to provide the most comprehensive policy analysis yet conducted of the impact of modularisation, unbundling and micro-credentialing in European Higher Education
- MicroCredX project addresses the needs of the strategic triangle of HEIs, the world of work and students.

The qualitative analysis is based on desktop-research to examine the relevant literature, policies and initiatives. One of the main outputs of the PR 8.1 research is the list of current micro credentials and platforms offering the micro credentials within the focus on agricultural sector.

I. Report on Institutional capacity and teaching strategies and assessment at the project partner institutions

The first part of the PR 8.1 analysis is focusing on collecting and organizing in a structured and shared database all the relevant information on the platforms, tools, organizations, cultural approaches, and experiences already existing at each partner institution. The collected relevant information serves to structure the guide on teaching and learning practices focusing on SCL creating an environment for micro credential development.

In PR5 we provided a survey, and 42 questions were included in the pool following the research on:

1. Institution
2. Computer Network
3. Video conferencing
4. E-learning
5. On-line courses
6. Active learning
7. Additional information

The collected information will allow to elaborate an action plan aimed at:

- ✓ Identifying the needs for upgrading existing - or creating new - facilities at each partner institution.
- ✓ Identifying the most suitable multimedia/digital tools for 'real-time' and/or 'on-demand 'contents, as well as the most suitable strategy to support both teacher/student and student/student interactions.
- ✓ Displaying the existing courses, seminars and cross-cutting activities provided in E- learning mode by each partner, where we conducted survey on teaching practices

Key findings indicate that data on digital and multimedia tools, organizational structures, cultural perspectives, and past and future experiences suggest that consortium member institutions share a common history and set of guidelines for facilitating student-faculty interaction. The use of pilot experiences indicates the possibility of synergies and linkages that may be evaluated and developed across the institutions.

The survey's findings imply that major infrastructure obstacles should not stand in the way of a cooperative education program built on distributed competence-based instructional modules.

The common platform among the partners is Moodle. All partner institutions prefer hybrid teaching combining e-learning with face-to-face. While all the consortium's institutions employ e-learning systems for their BS and MS programs, only BOKU and HOH go so far as to use them for PhD programs and lifelong learning.

According to the survey results, all partner institutions implement asynchronous teaching and learning. BOKU is the only institution that prefers asynchronous e-learning. When it comes to videoconferences, the TEMS is preferable, and the platforms are formally designated in each of the consortium's institutions. Active learning approaches are implemented at all partner institutions, listing some of the most common teaching strategies. (Figure 1)

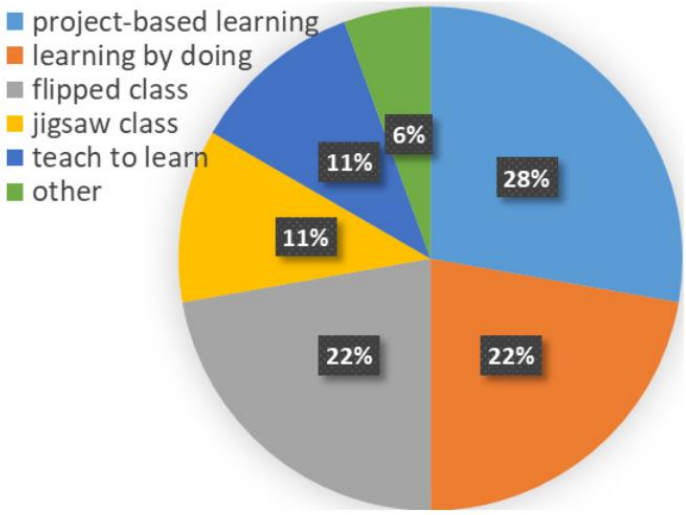


Figure 1: most common teaching strategies

As the survey shows, the most common teaching strategy among the partners is project-based learning (28%) followed by the flipped classroom (20%) and learning by doing (20%).

In the cluster "other type of active learning", teaching strategies were brainstorming, discussions, group work, case study learning, practical classes, team-based learning, and numerous different everyday teaching methods with active elements.

II. Report on micro credentials and quality assurance

On 16 June 2022, the Council of the European Union (EU) adopted a Recommendation on a European approach to micro-credentials for lifelong learning and employability. The Recommendation seeks to support the development, implementation and recognition of micro-credentials across institutions, businesses, sectors and borders. The Recommendation provides building blocks including a definition, standard elements for describing micro-credentials, and principles for designing and issuing micro-credentials.

The Council Recommendation aims to:

- Enable individuals to acquire, up/reskill and improve the knowledge, skills and competences to be better equipped to deal with current and future challenges. Furthermore, the Council highlights importance of collaboration between labour market and society towards transitions towards a green and digital economy

- Enhance the quality, transparency and flexibility of micro credential offers for learners that search for personalised and professional oriented learning pathways

- Foster inclusiveness, access and equal opportunities

Definition of micro credentials:

The COVID-19 crisis has led to rapid growth in demand for short forms of tailored learning opportunities such as micro credentials.

The European Union (EU) defines a micro-credential as:

the record of the learning outcomes that a learner has acquired following a small volume of learning. These learning outcomes will have been assessed against transparent and clearly defined criteria. Learning experiences leading to micro-credentials are designed to provide the learner with specific knowledge, skills and competences that respond to societal, personal, cultural or labour market needs. Micro-credentials are owned by the learner, can be shared and are portable. They may be standalone or combined into larger credentials. They are underpinned by quality assurance following agreed standards in the relevant sector or area of activity.

Source: Council of the EU (2022).

The European approach to micro-credentials offers a common definition that is valid across sectors of education and the world of work and mirrors the societal mission of education and training institutions, including higher and vocational education and training (VET) institutions, and non-formal providers as well as employers and labour market actors[1]:

A micro-credential is the record of the learning outcomes that a learner has acquired following a small volume of learning. These learning outcomes have been assessed against transparent and clearly defined standards.

Courses leading to micro-credentials are designed to provide the learner with specific knowledge, skills and competences that respond to societal, personal, cultural or labour market needs.

Micro-credentials are owned by the learner, can be shared and are portable.
They may be standalone or combined into larger credentials. They are underpinned by quality assurance following agreed standards in the relevant sector or area of activity.

For ensuring transparency and stackability of micro credentials, the European approach to micro-credentials suggests a list of mandatory and optional elements that any micro-credential should provide:

[1] European Union (2021). *A EUROPEAN APPROACH TO MICRO-CREDENTIALS.* https://education.ec.europa.eu/sites/default/files/2022-01/micro-credentials%20brochure%20updated.pdf

Mandatory elements:

- Identification of the learner
- Title of the micro-credential
- Country/Region of the issuer
- Awarding body
- Date of issuing
- Learning outcomes
- Notional workload needed to achieve the learning outcomes (in ECTS credits, wherever possible)
- Level (and cycle, if applicable) of the learning experience leading to the micro-credential (EQF, QF-EHEA), if applicable
- Type of assessment
- Form of participation in the learning activity
- Type of quality assurance used to underpin the micro-credential

Optional elements:

- Prerequisites needed to enrol in the learning activity
- Supervision and identity verification during assessment (unsupervised with no identity verification, supervised with no identity verification, supervised online or onsite with identity verification)
- Grade achieved
- Integration/stackability options (standalone, independent micro-credential / integrated, stackable towards another credential)
- Further information

Micro-credentials should be measurable, comparable and understandable with clear information on learning outcomes, workload, content, level, and the learning offer. The workload should be in alignment with ECTS and EQF level descriptors. Furthermore, micro credentials may be included in national qualifications frameworks/systems, where relevant and in line with national priorities and decisions.

Higher institutions and other providers should provide transparent and clear information on micro credential offers as well as guidance.

Micro credentials are designed to follow flexible learning pathways that are learner-centred and meet the needs of the target group of learners. Learning outcomes are assessed against transparent standards and learners feedback is considered as part of the continuous improvement of the micro credential. The modularisation approach allows other micro-credentials to be added to create larger credentials.

Quality Assurance

Quality assurance processes apply to the delivery of courses leading to micro-credentials (where applicable), assessment and certification and can be external and internal.

External quality assurance combines self-assessment, external review and processes for improvement. The essential principle is that micro-credential providers' internal QA system needs to be evaluated externally, ideally by an entity independent from the organisation running the QA system.

Internal quality assurance for micro-credentials should be adapted to reflect the lower risk profile and unique characteristics of these programs. This will ensure that the micro-credentials remain relevant, effective, and responsive to the needs of both learners and other stakeholders.

It is recommended for micro credential developers to include learners as equal partners in the internal quality assurance process**.**

The overall quality of the micro-credential depends on the quality standards including EQF levels, the European Standards and Guidelines for Higher Education, and the European Quality Assurance Framework for VET.

The Recognition and Lisbon Recognition Convention- LRC

The applicability of the LRC to micro-degrees means that recognition authorities, such as higher education institutions and ENIC/NARIC centers, must have quality-assured procedures and mechanisms for their recognition. If the micro-degree is awarded by an accredited higher education institution and the quality, workload, level and learning outcomes are certified, it will be subjected to the usual assessment process for academic recognition.

The MicroHE project aims to create a recognition framework for micro-credentials by examining the adequacy of European recognition instruments for micro credentials. This would provide more detailed information about micro-credentials compatibility with ECTS. Furthermore, the MicroHE project developed a micro credential Meta-data Standard[2] for recording ECTS based on the European Qualifications Framework (EQF) meta-data schema and ESCO data schema.

The Growth of Micro Credentials

According to the BOKU research there are no comprehensive statistics on the implementation of micro-credentials globally. Followed by the COVID-19 post pandemic global situation, development of the MOOCS is in expansion worldwide.

Micro-credentials can be delivered online or can be applied in face-to-face or blended formats.

The micro credentials are provided by higher education institutions, businesses and non-governmental organisations, agencies, professional associations, companies, and even peer reviewers.

Table 1 shows that the major global digital learning platforms for micro-credentials already have almost a 100 million of registered learners annually reflecting different types of micro credentials.

According to the MICROBOL project findings, higher education institutions provide credit-bearing micro-credentials (for which a learner earns credits at the completion) and non-credit-bearing micro-credentials (for which a learner does not earn credits).

While MOOCs have been offered by hundreds of providers since their appearance, higher education institutions have offered most of them either as separate learning modules or as part of a conventional degree.

[2] MicroHE Meta-Data Standard. (n.d.). *MicroHE*. Retrieved 22 August 2024, from https://microhe.microcredentials.eu/home/microhe-outputs/wp4/mds/

The project MicroCredex developed a course catalogue among the project partners that will be regularly adapted. More details can be found using the following link: https://microcredx.microcredentials.eu/micro-credentials-catalogue/ .

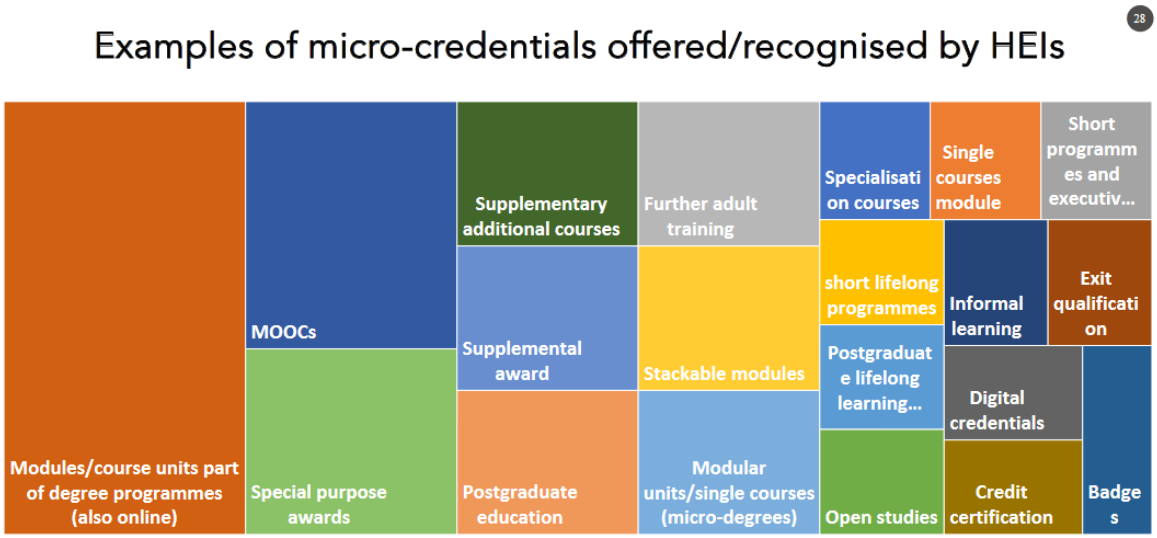
The European Commission has launched the Digital Education Action Plan and Europass platform for the integration of digitally signed qualifications.

Table 1: Number of registered learners and type of micro-credentials provided by the world's major EdTech platforms

Platform	Registered Learners	Types of Micro-Credentials (as of 2022)
Coursera	97 million (as of 2021)	Specialisation, MasterTrack, Professional Certificate
edX	42 million (as of 2021)	XSeries, MicroBachelors, MicroMasters, Professional Certificate, Professional Education
Udacity	11.5 million (as of 2019)	Nanodegree
Future Learn	17 million (as of 2021)	Program, ExpertTrack, Microcredential
LinkedIn Learning	17 million (as of 2020)	Path

Source: GUIDE TO DESIGN, ISSUE AND RECOGNISE MICRO-CREDENTIALS, European Training Foundation, 2022

A survey among European higher education institutions indicated that the most common types of credentials offered by them were certificates (41%) and badges (52%).



Source: Micro-GEAR

Table 2,3 and 4 reflect examples of European higher education institutions offering alternative credentials.

Table 2

University	Courses	Level	Relation to HEIs	Delivery mode
Baden-Württemberg Cooperative State University (DHBW)	Language courses, Intercultural Communication Scientific writing	Bachelor level		Online Own platform
Dublin City University (DCU)	Fintech, Computing	Master level		FutureLearn
Tampere University		All levels. Open university offers it at bachelor's and master's degree levels while CPD offers for working professionals.		Own platform
Linnaeus University	Open courses that offer certificates.	They provide short programmes for which a specific number of ECTS is allocated and which are part of the regular syllabus for Lifelong Learning & Continuing Professional Development.		Canvas.net and Eliademy
International University of La Rioja (UNIR)		Titulos proprios - 10 ECTS (250 hours, duration 4 months)		Own platform

Source: MicroBOL (2020)

Table 3

Fundacio per a la Universitat Oberta de Catalunya	Own degree/ Own training: master's degree, postgraduate, specialisation, seminars, online vocational training, professionalizing courses, master's degree, specialized diplomas Non-Official Titles:- Expert, university extension, Extended Study	Diploma or certificate Varying between < 1 and 60 ECTS	The system of specializations allows progressive access to the master certificate. Not in other cases.	100% online and Scalable
The Open University UK	Certificate in higher education, Higher national certificate	Certificate Level 4; 60 ECTS	The certificate of Higher Education is a recognised exit award in the UK framework. It can also be seen as a stepping stone to a formal Degree.	Online and Scalable FutureLearn
Open Universiteit NL	Certified Professional Programmes, Praktijkleergang, Focus programmes, Premasters.	Certificate or diploma Level 6-7 Varying between 5 and 60 ECTS	Can often be added within a bachelor, MBA or provides access to a master	100% online or Blended and scalable

Source: MicroBOL (2020)

Table 4

Politecnico di Milano	2 different offers: 1. Possibility for students to subscribe to single courses, obtaining credits after assessment. It can be done in almost all the Italian universities. Students can use the acquired credits to enrol on full course degrees. 2. Ongoing experimentation with open badges, used to promote innovative didactics practices.	A student can subscribe to any single course and have the extra credits added to the Diploma Supplement.		1. Not digital 2. Bestr -Cineca
Università Europea di Roma	Certificate of Specialisation Course for Credential Evaluator awarded by the Università Europea di Roma and the first micro-credential certified by CIMEA in the higher education sector, i.e. the Professional Certificate on Credential Evaluation	University certificate (12 ECTS), level 6/7	Italian Universities can award "diploma di perfezionamento", that is a form of micro-credential	Online Own platform Micro- credential awarded in blockchain (on the Diplome application)

Source: MicroBOL (2020)

List of micro credentials in the Agricultural Sector

Agriculture & Food Micro-credentials

Agriculture & Food micro-credentials are developed by academic faculty in the UCD School of Agriculture and Food Science. Agriculture, Food Science and Human Nutrition is one of UCD's most highly ranked disciplines, reflecting the level of expertise underpinning both programmes and research activity.

Agriculture and Food—UCD Micro-credentials. (n.d.). Retrieved 22 August 2024, from https://www.ucd.ie/microcredentials/explorecourses/foodandnutrition/

Principles of Sensory Science

In this micro-credential, you will learn all about the science that underpins our understanding of flavour and taste perception in food, and many of the different techniques available for the different types of research questions in this area. These methods can be applied to a huge variety of situations such as in reformulation to reduce sugar and salt while maintaining sensory appeal, to assess the popularity and customer taste satisfaction of a new product, or even to develop strategies for increasing the palatability of food, for example, to enhance children's vegetable consumption or improve consumer perception of hybrid meat.

Principles of Sensory Science—UCD Micro-credentials. (n.d.). Retrieved 22 August 2024, from https://www.ucd.ie/microcredentials/explorecourses/foodandnutrition/principles-of-sensory-science/

Global Food Systems

This micro credential serves as a broad overview of the global food system today. It will include the current state of food, agriculture and fisheries, the key influences on food systems, the role of government policies and interventions. It will explore the threats and opportunities the sector faces and what is needed to transition to a more sustainable, resilient food system and what the future of food and farming might look like.

Global Food Systems—UCD Micro-credentials. (n.d.). Retrieved 22 August 2024, from https://www.ucd.ie/microcredentials/explorecourses/foodandnutrition/global-food-systems/

Sustainable Entrepreneurship

The Micro-Credential "Sustainable Entrepreneurship" is a comprehensive programme designed to equip Master students from different chemistry-related study programmes with the entrepreneurial skills and knowledge required to thrive in the fields of **chemistry and life sciences**.

It is offered by Science & Startups and the Chemical Invention Factory (CIF) at Technische Universität Berlin.

All courses are held in English.

Micro-Credentials—TU Berlin. (n.d.). Retrieved 22 August 2024, from https://www.tu.berlin/eim/studium-lehre/micro-credentials#c2086957

Principles of Sensory Science

This online programme is specifically designed for professionals with a BSc experience or education in food and nutrition topics. Prior knowledge of fundamental statistical data analysis and tests, such as T-tests and ANOVA, is recommended. While a CEFR English level B2 "Upper intermediate" is advised, it's not obligatory. Join us today to take your understanding of sensory science to the next level.

Contact, D. you have any questions about this programme? W. A. (2022, January 14). *Principles of Sensory Science*. WUR. https://www.wur.nl/en/show/online-course-principles-of-sensory-science.htm

Plant Breeding: Experimental Design and Data Analysis of Breeding Trials

In this course, participants are taught principles of experimental design of trials and statistical analysis of trial data with a special emphasis on linear and generalised linear methods, mixed models, analysis of multi-environment trials using different statistical methods.

Plant Breeding: Experimental Design and Data Analysis of Breeding Trials. WUR. https://www.wur.nl/en/show/plant-breeding-experimental-design-and-data-analysis-of-breeding-trials.htm

III. Report on Legal Framework and National Regulations

Reference and link to qualification frameworks increases the understanding of the value of the micro-credentials.

According to analysis there are two approaches to mapping micro-credentials to existing NQFs:

- A new micro-credential qualification type may be established under the NQF.
- A micro-credential may be outlined as a subunit of an existing qualification on the NQF.

> *[The NQFs aim to] make qualifications easier to understand and compare. The NQFs classify qualifications by level, based on learning outcomes - that is, what the holder of a certificate or diploma is expected to know, understand, and be able to do. This classification reflects the content and profile of qualifications.*
>
> Source: Cedefop (2022).

EU Member States and 11 other countries have committed to implementing the EQF to make it more effective in facilitating the understanding of national, international and third-country qualifications by employers, workers and learners.

The European Commission has recommended the EU-Member States to develop National Qualification Frameworks. Each Member State implements its own qualification framework and allocates national qualifications based on the respective learning outcomes regardless of the education areas (from the vocational education, the tertiary education to the Education and Training) to a specific level.

National qualifications frameworks (NQFs) classify qualifications by level, based on learning outcomes.

European Inventory of National Qualifications Frameworks 2022

The analysis of European Inventory of National Qualification Frameworks 2022 reports focuses on gathering knowledge and insight from the international range of contexts in which regional and national qualifications frameworks operate searching for specifications among the partner countries. The overview of specifications and identification of differences support development of the LATEST common strategies for defining the learning outcomes and implementing innovative teaching methods toward micro credential development – The Guide 8.2.

"This Global Inventory of National and Regional Qualifications Frameworks is the result of longstanding collaborative work between the European Centre for the Development of Vocational Training (Cedefop), the European Training Foundation (ETF), the United Nations Educational, Scientific and Cultural Organization (UNESCO) and the UNESCO Institute for Lifelong Learning (UIL).[3]"

AUSTRIA

The Austrian Agency for Education and Internationalisation (OeAD) together with the European Centre for the Development of Vocational Training (Cedefop), Department for VET and Qualifications prepared the report that is part of the European inventory of national qualifications frameworks (NQFs).

Austria has designed a comprehensive framework (Nationaler Qualifikationsrahmen – NQR) that is open to all types of qualifications from the formal and non-formal sectors, apart from general education. It has eight levels and a 'Y structure', capturing differences between higher education and vocational education and training (VET) qualifications at higher levels. In 2012, the NQR was referenced to the EQF and self-certified to the qualification's framework of the European higher education area; it is operational.

According to this report around 70 % of learners follow a VET path at the end of compulsory education (Cedefop and ibw Austria, 2022). The adult participation in education and training in Austria is above the EU average despite the up/re skilling needs and the rate of tertiary education attainment, at 42.4 % in 2021.

The 2020–2024 Austrian government programme includes measures to create a legal basis for, and to expand, tertiary VET, in parallel to higher education, to better credit apprenticeships at tertiary level, upgrade the master craftsperson (Meister) qualification and create a pathway to NQR level 7 (professional master).[4]

The NQR levels in Austria

The NQR has eight levels (2), equivalent to those of the EQF. A 'Y structure' was agreed, to capture differences between higher education and VET qualifications at levels 6 to 8 of the NQF. Thus, EQF level descriptors are used for all qualifications at levels 1 to 5, while levels 6 to 8 follow two strands: qualifications related to the Bologna cycles (bachelor's degree, master's degree and doctorate), for which Dublin descriptors are used; and other qualifications, for which EQF level descriptors apply.[5]

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[3] Cedefop (2022) *Global inventory of national and regional qualifications frameworks 2022. Volume I - Thematic chapters.*
https://www.cedefop.europa.eu/en/publications/2237

[4] Cedefop (2023). European Inventory of National Qualifications Frameworks 2022 – Austria.
https://www.cedefop.europa.eu/en/country-reports/austria-european-inventory-nqfs-2022

[5] wtc. (n.d.). Descriptors. *Qualifikationsregister*. Retrieved 22 August 2024, from
https://www.qualifikationsregister.at/en/der-nqr/deskriptoren/

Higher education qualifications in the Bologna system (bachelor's degree, master's degree and doctorate) are mapped to the NQR automatically through the NQR act. Other qualifications are levelled following an allocation request. For more information, please follow the link:

Cedefop (2023). European Inventory of National Qualifications Frameworks 2022 – Austria. https://www.cedefop.europa.eu/en/country-reports/austria-european-inventory-nqfs-2022

According to the report in 2023 Austria has been levelled to the NQR 5 a total of 66 formal qualifications and 38 qualifications outside formal education and training. Since 2020, professional qualifications have been included at NQR levels 6, 5 and 4, youth qualifications at NQR levels 4 and 3 and Chance B qualifications at levels 2 and 1.

NQR levelled qualifications are included in the national qualifications register. The May 2023 register for example, contained 104 qualifications. Publishing the qualification in the register is a legal requirement for the levelling to become effective.

The main authority in charge of NQR development and implementation is the education ministry, which is responsible for all education and training subsystems. The EQF national coordination point (NCP) – the main administrative, coordinating and information office on the NQR and the EQF – was set up by the federal act on the NQR as an independent body within the Austrian Agency for International Cooperation in Education and Research (Österreichischer Austauschdienst – OeAD). It is governed by a contract between the OeAD and the education ministry and funded by the education and labour ministries, along with EU grants.

The recognition and validation of non formal and informal learning in Austria is regulated through national strategy for validating non-formal and informal learning, adopted in November 2017 that is linked to the 2020 lifelong learning strategy and the development of the NQR. The strategy has not yet been fully implemented.

GERMANY

The European Centre for the Development of Vocational Training (Cedefop), Department for VET and Qualifications and the Federal Ministry of Education and Research prepared report on the NQF development in Germany.

Germany has been implementing an eight-level NQF for lifelong learning based on learning outcomes (Deutscher Qualifikationsrahmen für lebenslanges Lernen (DQR)), including all levels and types of qualifications from formal education and training, and using professional competences (knowledge and skills), and personal competences (social competence and autonomy) as level descriptors. The DQR was referenced to the EQF in 2012. The qualifications framework for higher education, now an integral part of the DQR, was self-certified against the qualification's framework of the European higher education area in 2008. The framework is operational.

Level indicator			
Structure of requirements			
Professional competence		Personal competence	
Knowledge	Skills	Social competence	Autonomy
Depth and breadth	Instrumental and systemic skills, judgement	Team/leadership skills, involvement and communication	Autonomous responsibility/responsibility, reflectiveness and learning competence

Figure 2: Level descriptors in the German qualifications framework for lifelong learning

Source: Cedefop (2023). European Inventory of National Qualifications Frameworks 2022 – Germany. https://www.cedefop.europa.eu/en/country-reports/germany-european-inventory-nqfs-2022

Levelling of qualifications to the DQR is carried out by DQR bodies in accordance with a defined procedure. Each proposal is reviewed by the responsible DQR body.

There is a working group who has designed procedures for levelling qualifications awarded outside regulated formal education. They defined quality assurance criteria and described the role of evaluators.

According to the report on participation in education, in 2021, tertiary educational attainment (ages 25–34) was 35.7 %, below the EU-27 average (41.2 %) (European Commission, Directorate-General for Education, Youth, Sport and Culture, 2022). In 2020, participation in upper secondary vocational education and training (VET) was at the EU average (48.8 %), and participation in post-secondary VET was 94.5 %. In short-cycle tertiary education, vocational pathways are the only option.

The number of qualifications included in the DQR is increasing and in August 2022 the largest number of qualifications were at levels 4 and 6. More information please find following the link:

Cedefop (2023). European Inventory of National Qualifications Frameworks 2022 – Germany. https://www.cedefop.europa.eu/en/country-reports/germany-european-inventory-nqfs-2022

In Germany there is no single body for the overall coordination and oversight of the DQR. The main institutions at national level are the Federal Ministry of Education and Research (BMBF) and the Standing Conference of Ministers for Education and Cultural Affairs (KMK).

The body in charge of DQR implementation (NQF secretariat) is the coordination point for the German qualification's framework (Bund-Länder Koordinierungsstelle (B-L-KS)), set up by a joint initiative of the federal government and the Länder. The B-L-KS is also in charge of the national coordination point for the EQF.

Regarding recognition and validation of non formal and informal education, procedures to credit non-formal and informal learning were developed and tested in the Transitions from VET to higher education initiative.

Although the aim is for non-formally and informally acquired competences to be attributed to the DQR on an equal footing with formal qualifications, this is not yet feasible. The DQR committees are currently discussing such a leveling procedure.

The Act on the Assessment of Professional Qualifications/Recognition Act, which was introduced in April 2012, gives individuals the right to have their qualifications acquired abroad equivalent to a German qualification by a competent authority. Equivalence can also be granted if no proof of learning can be provided; this opens opportunities for the validation of non-formal and informal learning.

All qualifications allocated to the DQR/EQF have been included in the comprehensive DQR qualifications database on the DQR website under the title 'Qualification search' (Qualifikationssuche).

FRANCE

The European Centre for the Development of Vocational Training (Cedefop), Department for VET and Qualifications and the France Compétences prepared report on the NQF development in France.

The French National Professional Qualifications Framework (NPQF) belongs to the first generation of EQFs. The eight-level NPQF was introduced in 2018, with three levels: Complexity of knowledge, Level of expertise and Degree of responsibility and autonomy. The framework covers general upper secondary education, vocational, professional and higher education qualifications and qualifications acquired outside formal education and training. In 2002, the national register of professional qualifications (Repertoire national des certifications professionnelles, RNCP) was set up in 2002, which records vocational and vocationally oriented qualifications, including those from the higher education sector. The RNCP was linked to the EQF in 2010. In 2021, the NPQF was linked to the EQF and aligned with the Qualifications Framework for the European Higher Education Area (QF-EHEA).

According to the report on participation in education, in 2021, tertiary education attainment (age 25–34) (50.3 %) was higher than the EU-27 average (41.2 %) and the participation of adults in lifelong learning are close to the EU average (respectively 11 % and 10.8 % in 2021).

The 2018 law on the freedom of occupational choice and the 2019 decree on the NPQF have legally anchored the framework that differs from the RNCP by defining a new eight-level structure and the level descriptors. This action is quality assurde by defining the responsibilities of all qualification certification bodies and by defining 9 criteria for including qualifications to the RNCP (7 mandatory and 2 optional) and 6 criteria for RS (4 mandatory and 2 optional).

The law stipulates that RNCP qualifications must be into units/blocks of competences to promote the lifelong acquisition of skills and qualifications. It also allows for the transfer of qualifications registered in the Specific Register of Awards (Répertoire spécifique des certifications et habilitations, RS) as recognized units of competence of qualifications already registered in the RNCP and the definition of common competence blocks between two or more RNCP qualifications.

"A unit/block of competences is an 'identified part of a vocational qualification', defined as a 'homogeneous and coherent set of competences contributing to carrying out a professional activity autonomously, and which can be assessed and validated' (Labour Code, Article L6113-1)."[6]

The RNCP was an important instrument for ensuring the quality of qualifications and promoting lifelong learning, which is closely linked to the system for validating non-formal and informal learning. The NPQF functions as an instrument that provides an efficient and competence-based overview of vocational and professional qualifications for the working population and enable them to use their VET

[6] Cedefop (2023). European Inventory of National Qualifications Frameworks 2022 – France. https://www.cedefop.europa.eu/en/country-reports/france-european-inventory-nqfs-2022

credits to participate in training programs that are geared towards local, social, and economic challenges.

The stricture of NPQF has eight learning-outcome-based levels. The three level descriptors are like those of the EQF:

(a) complexity of knowledge - The descriptor illustrates the knowledge necessary to conduct professional activities at each level (processes, materials, terminology relating to one or more fields and theoretical knowledge)

(b) level of expertise, according to the complexity and technical nature of an activity - The descriptor defines the complexity and technical nature of a task or activity in a process, the level of mastery of the professional activity, the mobilisation of a range of cognitive and practical skills and the ability to communicate and develop interpersonal relations in the professional context.

(c) level of responsibility and autonomy - The descriptor defines the level of responsibility and autonomy regarding organisation of work, reaction to unforeseen situations, awareness of the complexity of the environment, understanding of interactions with activities in other professional fields, ability to advise supervised staff and participation in collective work.

These level descriptors mirror national specificities and in the French system the term ‘expertise’ is used instead of ‘skills’, highlighting the importance of ‘evaluation of competences and the desire to give an operational dimension’ to levelled qualifications.

NPQF level 1 has no descriptors and includes basic knowledge and there are no qualifications included at this level. The report shows that the newly introduced level 2 covers simple activities and limited autonomy and the levels 3 to 8 cover qualifications previously included at the five levels of the RNCP.

The regulation of NPQF including EQF developments in France is led by the France Compétences, a national public institution with a quadripartite structure representing the state, the regions and the employers' and employees' organizations at the national and international level. All it´s actions of France Compétences, are supervised by the labour ministry (Ministry of Labour, Employment and Professional Integration). Furthermore, the institution is responsible for the implementation of national continuing VET policies, financing vocational training and apprenticeships and regulating the VET market in terms of skill needs and demands.

The validation of non-formal and informal learning is strongly connected to lifelong learning, training, and employment policies. The VAE system leads to qualifications registered in the RNCP and it is governed by France Compétences.

There is a single database that serves as the entry point for two different but fully interconnected registers. The RNCP includes all levelled qualifications (by law or on request), with the exception of general and technical qualifications.

ITALY

This report was produced by the European Centre for the Development of Vocational Training (Cedefop), Department for VET and Qualifications and the National Agency for Active Labour Market Policies (ANPAL) for their valuable contribution.

The Italian NQF (Quadro Nazionale delle Qualificazioni, QNQ) is divided into eight levels, the qualifications of general, technical and vocational, higher education, adult education, vocational

qualifications managed at regional level and qualifications for regulated professions defined by level descriptors covering three dimensions: knowledge, skills, and responsibility and autonomy.

VET qualifications at regional level and qualifications for regulated professions. The framework is currently in the activation phase. With the first referencing report (2013), formal education and training qualifications were directly linked to the EQF. In 2022, an updated referencing report was submitted to the EQF advisory group. A qualifications framework for higher education was itself developed into the Qualifications Framework for the European Higher Education Area (QF-EHEA) in 2012.

In 2021 the participation in tertiary education (age 25-34) (28.3%) was significantly lower than in EU 27 (41.2%), in upper secondary VET was higher than the EU average (51.9% versus 48.7%), and within post-secondary non-tertiary and in short-cycle tertiary education there are only vocational pathways available.

The QNQ was adopted through the inter-ministerial decree No. 20/2018 following the 2023 adapted version. Furthermore, a national strategy on lifelong learning was defined, establishing a National System for Certification of Competences (NSCC) (the QNQ includes NSCC qualifications) and a national repository of education, training and vocational (learning-outcomes-based) qualifications awarded at national and regional levels.

“The QNQ is a reference tool in implementing the three main pillars of the lifelong learning strategy: the national system for certification of competences; an integrated system of training, education and employment services; and a single system for the interoperability of the different information sources. The NQF has two main functions: description and classification of Italian qualifications that are part of the NSCC and referencing of qualifications to the EQF to enable comparison with those of other European countries.”[7]

The sub-descriptors have also been developed, extending the EQF level descriptors.

The learning outcomes approach has been introduced at national and regional levels, with each subsystem having its own characteristics. At upper secondary level (QNQ level 4), general (licei), technical and vocational education qualifications and regional qualifications awarded within the State-Regions agreement are described in learning outcomes according to a 2010 Presidential decree on general education reform.

In higher education, Dublin descriptors (knowledge and understanding, applying knowledge and understanding, making judgements, communication skills, learning skills) are used nationally for the cycles of higher education agreed within the Bologna process.

The Ministry of Labour and Social Policies, in cooperation with the Ministry of Education and the Ministry of University and Research and in agreement with the regions, autonomous provinces and social partners, has been leading the QNQ development at a strategic level.

Development and implementation of the EQF NCP is regulated by the National Agency for Active Labour Market Policies (ANPAL). Furthermore, here are also inter-agency bodies responsible for discussing QNQ-related services topics and supervising and coordinating its implementation.

[7] Cedefop (2023). European Inventory of National Qualifications Frameworks 2022 – France. https://www.cedefop.europa.eu/en/country-reports/france-european-inventory-nqfs-2022

The validation and recognition process is strongly linked to the QNQ development and implementation as the reference point for the identification, validation and certification.

The National Agency for Active Labour Market Policies (ANPAL) hosts the NCPs of EQF, Euroguidance and Europass and conducts joint multi-channel communication and dissemination activities.

The register is under development and the QNQ qualifications are published in different databases/registers, which are not interconnected.

The list of the most valid policies

- European Skills Agenda (June 2020): identifies micro-credentials as a way to up-skill and re-skill professionals, to value learning outcomes and to increase permeability and flexibility between different education sectors and pathways.
- Digital Education Action Plan 2021-2027 (Sept. 2020): considers micro-credentials a tool to support the relevance, quality and inclusiveness of European education and training at all levels.
- European Education Area (Feb. 2021): micro-credentials are seen to diversify the student population and to make higher education more inclusive by 2025 by supporting lifelong learning and providing more flexible and modular learning opportunities.
- The European Pillar of Social Rights Action Plan (2021): sees micro-credentials as an innovative instrument that 'can facilitate flexible learning pathways and support workers on their job or during professional transitions'.
- European Approach to micro-credentials (Feb. 2021): a common definition of micro-credentials, presentation of building blocks, and a roadmap of actions for their development and adoption in Europe. Final report delivered in February 2021 by a group of experts established by the European Commission.
- European strategy for universities (Jan. 2022): micro-credentials as a means of contribution to professional reskilling and upskilling to meet new and emerging needs in society and labour market, and to develop skills and competences and technological innovation for the digital and green transition.
- Council Recommendation of 16 June 2022 on a European approach to micro-credentials for lifelong learning and employability (June 2022): a common definition of micro credentials, sets out actions to develop 'ecosystems for micro credentials', make recommendations on their use for the benefit of learners, support the development and use of micro credentials.
- 2023 as the European Year of skills
- Role of European University Alliances in offering flexible learning opportunities and pathways for any age group, with some leading to micro-credentials
- Proposal for a Council Recommendation 'Europe on the Move' – learning mobility opportunities for everyone: promotion of micro-credentials as an element of the overall strategy for mobility within the European Education Area
- Higher Education Package
    - Blueprint for European Degree
    - Proposal for a Council Recommendation on a European Quality Assurance and Recognition System in Higher Education
    - Proposal for a Council Recommendation on attractive and sustainable careers in higher education

References

European Union (2021). *A EUROPEAN APPROACH TO MICRO-CREDENTIALS.* https://education.ec.europa.eu/sites/default/files/2022-01/micro-credentials%20brochure%20updated.pdf

McGreal, R., & Olcott, D. (2022). A strategic reset: Micro-credentials for higher education leaders. *Smart Learning Environments*, *9*(1), 9. https://doi.org/10.1186/s40561-022-00190-1

A European approach to micro-credentials—European Education Area. (n.d.). Retrieved 22 August 2024, from https://education.ec.europa.eu/education-levels/higher-education/micro-credentials

MicroHE Meta-Data Standard—MicroHE. (n.d.). Retrieved 22 August 2024, from https://microhe.microcredentials.eu/home/microhe-outputs/wp4/mds/

About the Project. (n.d.). *MicroCredX*. Retrieved 22 August 2024, from https://microcredx.microcredentials.eu/about/

Home. (2022, March 8). MicroHE. https://microcredentials.eu/home/

Lisbon Recognition Convention—Higher education and research. (n.d.). Retrieved 22 August 2024, from https://www.coe.int/en/web/higher-education-and-research/lisbon-recognition-convention

Microbol (2020). *European project MICROBOL. Micro-credentials linked to the Bologna Key Commitments. Desk research report.* Retrieved 22 August 2024, from https://microbol.knowledgeinnovation.eu/wp-content/uploads/sites/20/2020/09/MICROBOL-Desk-Research-Report.pdf

European Training Foundation (2022). *GUIDE TO DESIGN, ISSUE AND RECOGNISE MICRO-CREDENTIALS.* Retrieved 22 August 2024, from https://www.etf.europa.eu/sites/default/files/2023-05/Micro-Credential%20Guidelines%20Final%20Delivery.pdf

Cedefop (2023). European Inventory of National Qualifications Frameworks 2022 – Austria. https://www.cedefop.europa.eu/en/country-reports/austria-european-inventory-nqfs-2022

Cedefop (2023). European Inventory of National Qualifications Frameworks 2022 – Germany. https://www.cedefop.europa.eu/en/country-reports/germany-european-inventory-nqfs-2022

Cedefop (2023). European Inventory of National Qualifications Frameworks 2022 – France. https://www.cedefop.europa.eu/en/country-reports/france-european-inventory-nqfs-2022

Cedefop (2023). European Inventory of National Qualifications Frameworks 2022 – Italy. https://www.cedefop.europa.eu/en/country-reports/italy-european-inventory-nqfs-2022

Task 8.2 Guide for best practices in learner-centered teaching and didactic methods containing micro-credentials

Contents

ACRONYMS

CEDEFOP - European Centre for the Development of Vocational Training

CTW - Collaborative Teamwork

ECTS - European Credit Transfer System

EUCEN - The European University Continuing Education Network

EQF - European Qualifications Framework

NQF - National qualifications framework

SCL – Student Centred Learning

Introduction

Due to a global digital transition and in particular digital transformation in the agricultural sector, the LATEST Project assesses the potential of micro-credential certificate-oriented education to fill the gaps in skills and competences and to react to the latest demands that come from the labour market. Regarding the recovery from the COVID-19 global situation, and to be suitable for more professionals who practice distance work, the project will offer education tools that are more flexible, holistic, and integrative, where the learner´s position is central and interactive by creating an integrated curriculum with a reflective transfer for lifelong use. Through research and a comparative analysis, the Project provides a holistic overview of innovative teaching approaches that integrate social, economic, and pedagogical aspects that result in working capabilities and professional competences, personal development, and more activities in the digital era especially for lifelong learners. Research will be conducted on institutional capacity, administration and IT structures that also suit traditional education, flipped classroom capacity and management strategies, teaching methods and assessment, possibilities on combining micro-credentials with traditional programmes, legal framework and national regulations, and quality assurance. All these findings structure a guide for best practices in learner-centred teaching and didactic methods as the Output of the PR8. The guide will also serve as the model to assess the effectiveness of educational programs. It will steer distance education for a learner-centred approach integrating digital technologies for knowledge-based societies where organized learning must become a lifelong process. The focus is on changing the roles of faculty and students, on the constructive design of micro credentials for quality education, teaching methods, outcomes assessment and administrative support.

1.1 Methodology and structure of a Guide

BOKU LLL expertise uses its relevant active membership in the EUCEN network and provides desktop-research to examine the relevant literature on how the student-centred approach in teaching and learning is operationalized. It involves literature search with scholarly databases comprising ScienceDirect, Scopus and Web of Science. The qualitative search was conducted with keywords comprising student-centred, learning, education, approach and pedagogy as well as a combination of the keywords such as student-centred learning and student-centred approach, micro credentials, micro credentials approach, micro credentials development. Preparing the guidelines on the SCL approach follows comprehensive research conducted by the UDINE partners in the PR5 referring institutional support and documented technology, collecting teaching practices and strategies among the LATEST partner institutions.

The structure of the Guide is focused on seven benchmarks:

1. **Institutional support**: Documented technology plan for the flipped classroom and management strategies for teachers on how to best organize and manage their time for creating high-quality material for students to learn remotely as well as strategies for students on how to best organize their own time.
2. **Micro-credential development**: Instructional guidelines as standards for course development (e.g. design, delivery) and learning outcomes in order to meet the needs of

learners. The set of programme standards that will ensure the engagement of students in analysis, synthesis, application, integrative projects that demonstrate student learning and achievement of desired competences and evaluation with regard to the learner-centred approach.

3. **Teaching/Learning**: Constructive guidelines for student interaction with faculty and other students as well as for teachers on how to monitor, guide and support the learning process.
4. **Teaching methods/activities and assessment for the flipped classroom**: The demographics of students in higher education has been changing towards "older" and "working adults". These students bring expertise of their own into the class and want to react more interactively with teachers. Feedback to student assignments and questions must be constructive and provided in a timely manner.
5. **Student support:** Advice for students on the programme structure and opportunities, knowledge requirements, financial and administrative requirements as well as the technical support regarding online learning and knowledge resources – "virtual library"
6. **Faculty support:** On one hand, guiding faculty members on how to best approach their diverse students in learner-centred teaching and how to understand their personal development in order to reach higher student motivation. On the other hand, providing technical support in terms of training and assistance for effective online course development.
7. **Evaluation and Assessment**: Activities such as the application of specific standards for the assessment of the teaching/learning process and regular reviews of learning outcomes will ensure the quality standards of the learner-centred approach in micro-credentials

The Guide includes a theoretical part on the SCL approach, practical guidelines on teaching methods and assessments, curriculum design towards micro credential development and guidelines for writing the learning outcomes focusing on diverse target groups, hybrid learning and guidelines on the E-learning approach.

Student Central Learning - SCL

The high educational system has been changed and is evolving in the last 50 years. Over the last ten years, the traditional classroom model has been shifted to a model where the teachers use various student-centred strategies to equip, prepare, and produce students that are able to succeed after graduation.

Figure 3: Student Central Learning

The revolution in the education system brought new aspects such as:

- How to teach
- The relationship between teacher and student
- The way in which the classroom is structured
- The nature of the curriculum

Students learn from their teachers in various ways, but student-centred-learning is more unique because it is not teacher-centred. This approach highlights the development of autonomy and independence in the learning environment by putting tasks for the learning path in the hands of students, where the students actively participate and where the students are in the focus. Constructive interdependence, personal accountability, motivated interaction, suitable use of social skills, and cluster processing are five essential components of the approach. The methods of student-centred learning range from personalized learning, problem solving learning, and flipped classrooms. Student centred-learning strategies enable student's empowerment, communications, critical thinking skills, independence and problem-solving techniques.

Furthermore, students choose what they will learn, how they will pace their learning, and how they will assess their own learning by playing the role of the facilitator of the classroom.

2.1 History of Student Central Learning – SCL

The history roots of a student central role in the education goes back to Jean-Jacques Rousseau (1712–1778) who positioned his theoretical student Emile's intrinsic interests at the centre of his education. According to his approach, the teacher's task was to facilitate Emile's inquiries and to provide for student interests, considering what the student is capable of and what he is interested in to learn.[8]

The main principles of Rousseau's ideas were that each child has their personal characteristics and is a unique individual that differs depending on the stage and rate of growth leading us to understand the importance of a more individualised curriculum design.

Rousseau's vision of education suggested that children were able to reach conclusions based on their own experience and knowledge, pointing that education should adapt to the child's needs, rather than the child adapting to the school. Rousseau´s ideas were taken forward by other great thinkers of the 18th and 19th centuries, most notably the Swiss pedagogue Johann Pestalozzi (1746-1827) and the German pedagogue Friedrich Froebel (1782–1852)[9].

There are several influential educational philosophers and thinkers influenced by Rousseau´s ideas on how students learn[10]:

- Progressive education perspectives which ground education in "real experience" (Dewey 1938),
- Humanist thought (Rogers 1951), critical perspectives (Freire 1974/2005, 1998; Giroux 1997),
- Constructivist theories (Piaget 1972; Vygotsky 1978),
- Open forms of education (Fink 2003) and andragogy,
- The art and science of teaching adults (Lindeman 1926; Knowles 1970)

[8] Hoidn, S., & Reusser, K. (2020). *Foundations of student-centered learning and teaching*. https://www.researchgate.net/publication/338921121_Foundations_of_student-centered_learning_and_teaching?enrichId=rgreq-745bb33d708ea0865f5e4bbff8c1e933-XXX&enrichSource=Y292ZXJQYWdlOzMzODkyMTEyMTtBUzoxMTQzMTI4MTA4MDAwMzc2MUAxNjYxMDAwNjk5MDE5&el=1_x_3&_esc=publicationCoverPdf

[9] Morris, T. H., Bremner, N., & Sakata, N. (n.d.). Self-directed learning and student-centred learning: A conceptual comparison. *Pedagogy, Culture & Society*, *0*(0), 1–20. https://doi.org/10.1080/14681366.2023.2282439

[10] Hoidn, S., & Reusser, K., 2020.

2.2 Current vision and conceptual thinking on student centred learning

Despite the relative success of SCL in Western European countries, some authors criticise the vagueness when it comes to defining it. This is partly because of the interlinkage with numerous other terms (e.g., progressivism, flexible learning, problem-based learning, person-centred Learning). This issue is reflecting with varying degrees of overlap and distinction. The American Psychological Association-APS in 1997 has established 14 learner-centred principles, which were divided into four domains:

1. The cognitive and metacognitive: Teachers encourage learners to relate the content with their prior learning and knowledge and to enhance self-reflective learning.
2. Motivation and emotional: Teachers enhance learners' self-motivation through choosing content that is interesting to learners, geared at the right level, and incorporating some degree of choice and control.
3. Developmental and social: Teachers are aware of learners' development differences and growth stages as well as of their capability of social interactions.
4. Individual differences: Teachers are aware of learners' individual differences particularly in the assessment phase.

Schweisfurth (2013) examined justificatory narratives for SCL that help us to understand its different characteristics:

1. Economic perspective: SCL has the potential to prepare learners to be competitive in an increasingly changing world. In this perspective the assumption is that young people are searching for skills development such as autonomous learning, critical thinking and creativity –skills that are supposedly likely to be developed under a student-centred approach
2. Cognitive perspective: SCL leads learners to long-lasting learning with deeper and higher motivated aspects of learning.
3. Emancipatory perspective: SCL enables learners to reach social benefits such as increased democracy, improved teacher-student relationships, and, from an epistemological point of view, the idea of seeing knowledge as less 'fixed'.

In the meta-analysis and comparison of SCL definitions found in 326 journal articles in the literature and interpretations of 248 English language teachers, Bremner (2021) emphasizes ten aspects of SCL (Table 1). The findings show that SCL was more interpreted in terms of active participation and interaction and less on aspects such as power-sharing[11].

Table 1 Summary of Ten aspects of SCL, with percentage coverage of literature and English Language teachers

[11] Morris, T. H., Bremner, N., & Sakata, N. (n.d.).

Aspect of SCL	Explanation	Literature coverage (Bremner 2021a)	Teachers' coverage (Bremner 2021b)
Active participation	The teacher organises learning so students actively participate (including hands-on learning, learning by doing, etc.).	75%	82%
Interaction	The teacher organises learning so students can interact with others (including pair work, group work, etc.).	70%	80%
Real-life skills	The teacher not only teaches theoretical knowledge, but also 'real-life' skills that students can apply outside of the classroom.	45%	62%
Higher order skills	The teacher organises learning so that there are opportunities for students to develop higher order skills (including critical thinking, creativity etc.).	30%	59%
Adapting to needs	The teacher bases learning around the students' prior knowledge, skills and experiences, and adapts learning based on students' needs and interests (including flexible learning, personalised learning, etc.).	60%	70%
Power-sharing	The teacher provides opportunities for the students to be more involved in decision-making regarding what they learn, how they learn, and how they are assessed (including learner choice, control, more democratic relationships, reduction of power distances, as well as epistemological considerations – viewing knowledge as more fluid).	50%	53%
Autonomy	The teacher organises learning so that there are opportunities for students to work independently, both in and out of the classroom (including students taking responsibility for their own learning, becoming less dependent on the teacher, etc.).	67%	65%
Metacognition	The teacher not only teaches content, but also provides opportunities for students to reflect about how they learn.	30%	71%
Formative assessment	The teacher provides formative assessment as well as summative assessment (including viewing learning as a process as opposed to just a product).	10%	58%
Humanistic role	The teacher takes a 'whole person' approach towards the students and their learning, focusing not only on their cognitive needs but also their needs as human beings (including focusing on affective factors, emotional wellbeing, wellbeing, viewing students as individuals, etc.).	25%	58%

There is no final single definition of SCL among all proponents and researchers but a core principle of the SCL approach, which is that the student/learner is at the heart of the learning process. In such approach a group of students/learners represents diversity in opinions, abilities and strengths where the proper interaction with teachers and others in such a learning environment empowers students to realise their full potential.

2.3 Conventional versus Student-Centred Learning Approach

In conventional learning, or known as the traditional learning environment, students may take a role as passive receptors of information, without active participation in the learning process. The academic, as the teacher, is responsible for designing the curriculum, setting tasks and formulating the assessment procedure where the teaching and learning are in learning theatres and laboratories. In such an environment, motivation is based on the competition between students mainly among the grades where the focus of learning is being geared towards the next exam. The student-centred learning approach allows students to shape their own learning paths and to actively participate in making their educational process a meaningful one. In an SCL learning environment, the focus is on peer-review and continuous self-assessment, allowing more flexibility towards lifelong learning. SCL thus needs to be tailored not only to different student-types, but also to the discipline and the environment in which such learning takes place.

The Learning Continuum

Teacher-Centred Learning	↔	Student-Centred Learning
Low student choice	↔	High student choice
Passivity of students	↔	Activity of students
Teacher as holder of power	↔	Student empowerment

Figure 4: The Learning Continuum

Parameters of SCL

There are four parameters that characterize SCL:

1. Innovative teaching methods
2. Learning outcomes
3. The use of a system of transfer and accumulation of credits - ECTS
4. Flexible curricula and learning paths

1. ***Innovative teaching*** **methods** in lifelong learning matters are enhancing students' critical thinking, thus grooming individuals to become independent lifelong learners. It can take forms of:

   a. Team Learning – a cooperative or interactive way of learning where the students share their ideas and learn from each other

   b. Problem-Based Learning – the students applying the knowledge they gain early on during their learning (thus not merely at exam time). Furthermore, students can solve the problems or situations they would normally face outside of the classroom

   c. Student Self-Regulated Learning – students are responsible for their learning, motivation, assessment and monitoring, and feedback during and after learning. According to Zimmermann there are 8 skills important in identifying student characteristics in self-regulated learning:

      1. Setting specific goals for oneself
      2. Adopting powerful strategies for attaining these goals
      3. Monitoring one's performance
      4. Restructuring one's learning environment to make it compatible with one's goals
      5. Managing one's time effectively
      6. Self-evaluating one's methods
      7. Attributing results to causation; and
      8. Adapting future methods

All these types of learning have characteristics of active learning.

2. ***Learning outcomes*** can be defined by the knowledge, skills and competences, and particularly in the SCL environment and approach, learning outcomes refer to the achievements of the learner and thus do not relate to the perspective of the teacher or of the teaching process as such. Learning outcomes should have future orientation, identify important requirements, understandable, achievable, and accessible to students.

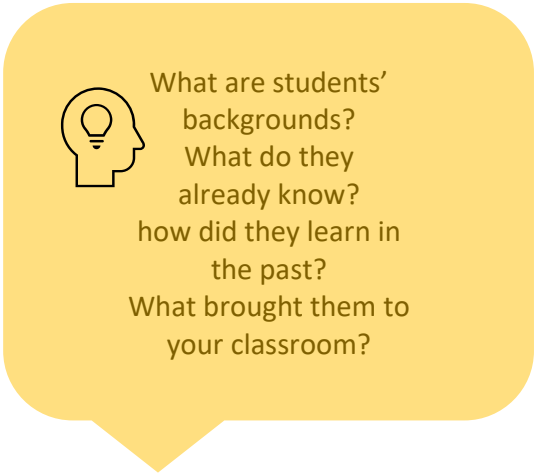
   In the adult and professional student perspective, a professional body may set its own achievement expected for each learning outcome. For example, for some disciplines a competency may be required and for others awareness. Writing the learning outcomes usually requires usage of active verbs reflecting what is expected to be learned.

3. ***ECTS*** is a learner-centred system which aims to increase transparency of learning outcomes and learning processes.[12]

4. ***Flexible curricula and learning*** **paths** – designing and maintaining a flexible curriculum means that students are empowered to construct their own learning and take their own decisions and responsibilities. The learning outcomes and learning paths suit the needs of the students. This is the core of lifelong learning environments.[13]

3.1 How to enhance students' motivation?

In the SCL approach, both students and educators have important roles to enhance the learning motivation.
The educators need to have certain knowledge of the students to know how to motivate and active involve students into learning:



All these questions and findings teachers can provide in small or large group of students.
In small groups, teachers can motivate students to ask each other why they chose the class, what they expect from the class, and what they already know about the subject-matter.

[12] Hariduse, noorte, spordi ja kultuuri peadirektoraat (Euroopa Komisjon). (2010). *ECTS and Diploma Supplement Label Holders 2009 & 2010: Make mobility a reality : excellence in Europe's universities*. Euroopa Liidu Väljaannete Talitus. https://data.europa.eu/doi/10.2766/67570
[13] Student Centred Learning an Insight Into Theory And Practice, https://esu-online.org/wp-content/uploads/2016/07/2010-T4SCL-Stakeholders-Forum-Leuven-An-Insight-Into-Theory-And-Practice.pdf

In larger lecture groups, the teacher can divide the big class group into the small groups to briefly summarise each group's knowledge of the subject, sharing this with the whole class.

According to the analysis, the students are likely to enhance their motivation by offering them strategies that can deepen their knowledge and learning. The best practices are the following:

- Involvement in the curriculum design and co-creating compelling courses
- Making students aware of benefits and different career paths
- Exposing students to extremes of the subject matter
- Applying their own research to the learning experience of students
- Inviting representatives from society and relevant stakeholders with specific expertise to share their knowledge and experience
- Connecting practical and learning experiences in their profession with experiences gained during their study

Knowing students' previous experience, teachers have a better position to assist students by increasing relevance and understanding. Previous experiences impact students' views of learning, their motivation and approach to learning.

3.2 Benefits of SCL

There is a wide range of benefits considering implementation of SCL for teachers, students and professionals.

- Increased motivation
- Independence and responsibility
- Self-improvement
- Professional development in academia
- Better teacher role and motivation
- Fostering lifelong learning
- Better working conditions
- Better retention rates in higher education
- Higher attraction for students
- Diversity among students

3.3 Checklists for successful SCL implementation

Checklists are key tools for successful implementation of SCL. There are 9 checklists see the tables:[14]

1. Consultation with Students [Tick as Appropriate]		Yes	No
1.1	Are there transparent procedures in place for students to be able give feedback on the quality of the educational process?	❍	❍
1.2	Are students consulted on curriculum content?	❍	❍
1.3	Are students consulted on the teaching and evaluation methods used?	❍	❍
1.4	Are students involved in periodic programme quality reviews?	❍	❍
1.5	Are students involved as full and equal members in committees where issues relating to the student experience are discussed at all levels (e.g. department, faculty, university, etc.)?	❍	❍
1.6	Are straightforward procedures in place for students to appeal decisions regarding their academic attainment or progression?	❍	❍

2. ECTS (European Credit Transfer System) and Learning Outcomes [Tick as Appropriate]		Yes	No
2.1	Are students consulted when learning outcomes are designed?	❍	❍
2.2	Are student needs and the diversity of the relevant student group considered when designing learning outcomes?	❍	❍
2.3	Are students informed on the intended learning outcomes before they start a course or programme component?	❍	❍
2.4	Are ECTS credits used co-related with defined learning outcomes?	❍	❍
2.5	Are credits transferable between courses and institutions?	❍	❍
2.6	Are credits measured based on student workload, independent of contact hours?	❍	❍
2.7	Are students awarded credits for activities that help them attain intended learning outcomes if conducted outside the institution?	❍	❍
2.8	Does your institution refer its qualifications to a Qualifications Framework?	❍	❍

[14] Attard A. et al. (2010) Student Centred Learning an Insight Into Theory And Practice, Printing: Partos Timisoara, Bucharest. https://esu-online.org/wp-content/uploads/2016/07/2010-T4SCL-Stakeholders-Forum-Leuven-An-Insight-Into-Theory-And-Practice.pdf

3. Quality Assurance [Tick as Appropriate]		Yes	No
3.1	Are both staff and students consulted during the institutional quality assurance process?	❍	❍
3.2	Are both representatives of teachers and students involved as full and equal members in the panels undertaking institutional quality assurance reviews?	❍	❍
3.3	Do institutional quality assurance reviews and guidelines take into account the overall elements of teaching and learning?	❍	❍
3.4	Do programme quality reviews take into account the use of learning outcomes?	❍	❍
3.5	Do programme quality reviews take into account the assessment methods used?	❍	❍
3.6	Do external quality assurance evaluations refer to the teaching and learning process?	❍	❍

4. Mobility, Recognition and Prior Learning [Tick as Appropriate]		Yes	No
4.1	Are study periods conducted by students in other institutions within various mobility schemes recognised by your institution?	❍	❍
4.2	Do incoming mobile students at your institution benefit from support in order to be able to cope with their new cultural and linguistic environment?	❍	❍
4.3	Are examples of good practice in teaching and learning that mobile staff come into contact with discussed and disseminated at the institutional level?	❍	❍
4.4	Is prior learning (in non-formal learning environments) recognised by your institution for the purpose of access into educational programmes?	❍	❍
4.5	Is the process of recognition easy?	❍	❍
4.6	Can recognition of prior learning be done without significant costs or bureaucracy?	❍	❍

5. The Social Dimension [Tick as Appropriate]		Yes	No
5.1	Are special support measures in place in order to help students from disadvantaged backgrounds?	❍	❍
5.2	Are learning paths flexible enough so as to permit combining work/family-life and studies?	❍	❍

6. Teaching and Learning Methods [Tick as Appropriate]		Yes	No
6.1	Does your institution use peer assessment and peer learning?	❍	❍
6.2	Does your institution have programmes for which it uses activity-based learning?	❍	❍
6.3	Is group-work used in the learning process within your institution?	❍	❍
6.4	Are extra-curricular activities of students accepted and recognised as an essential part of the learning experience?	❍	❍
6.5	Is the development of transversal skills by students one of the objectives of the learning process in your institution?	❍	❍

7. Student Assessment Methods [Tick as Appropriate]		Yes	No
7.1	Are the goals of the learning process agreed upon between teachers and students?	❍	❍
7.2	Are peer- and self-assessment used as a method in the student assessment process?	❍	❍
7.3	Are projects used in the assessment of students?	❍	❍
7.4	Are simulations of tasks and ›real life‹ situations used in the assessment of students?	❍	❍

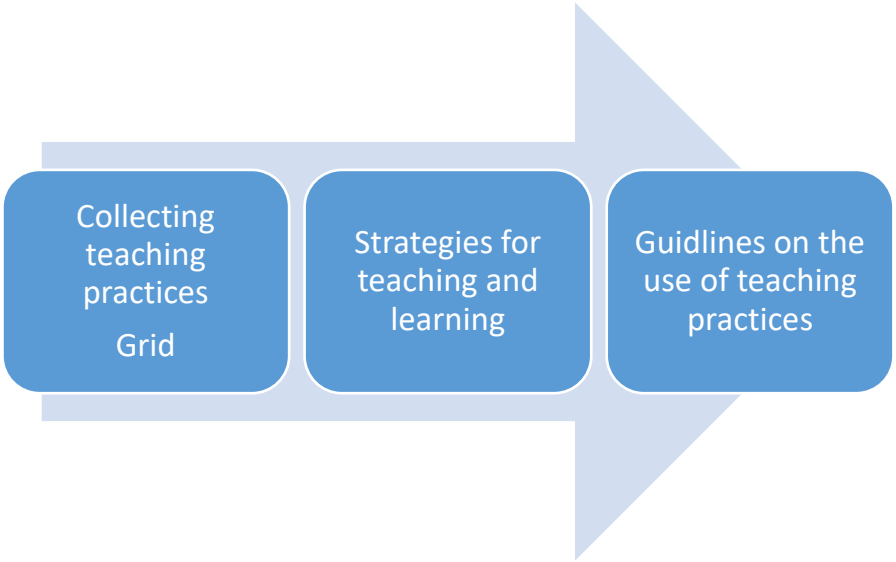
8. Learning Environment [Tick as Appropriate]		Yes	No
8.1	Do students have access to appropriate research and study facilities both on and off campus?	❍	❍
8.2	Is information technology used within the learning process?	❍	❍
8.3	Do librarians collaborate with teachers in order to enhance students' learning experience?	❍	❍
8.4	Does you institution contribute to promoting a national/regional culture of SCL?	❍	❍

9. Professional Academic Development [Tick as Appropriate]		Yes	No
9.1	Does your institution have any guidelines on teaching and learning?	❍	❍
9.2	Does your institution have a regular professional development programme for teaching staff?	❍	❍
9.3	If yes, does this programme include a constructive discussion on the application of teaching methods?	❍	❍
9.4	Does this programme use an SCL approach in providing training on the use of innovative teaching methods and student-centred curriculum development?	❍	❍

Figure 5: Toolkit

Collecting teaching and learning methods - the best choice

In line with PR5 results, one of the PR8 goals is to conduct a benchmark on teaching practices and technological support at the partners institutions and to investigate the best current innovative teaching and learning methods within the focus on SCL. This strategy provides information and creates a grid of collected teaching practices and defines a guide.



The purpose of the teaching practices collection process is to create new teaching perspectives in the teaching/learning environment such as SCL for international/diverse learner groups in adult education and lifelong learning.

4.1 Benchmarks that allow structure and design of a Guide

The first part of the PR8 analysis is focusing on collecting and organizing in a structured and shared database all the relevant information on the platforms, tools, organizations, cultural approaches, and experiences already existing at each partner institution. The collected relevant information serves to structure the guide on teaching and learning practices focusing on SCL creating an environment for micro credential development.

In PR5 we provided a survey, and 42 questions were included in the pool following the research on:

1. Institution
2. Computer Network
3. Video conferencing
4. E-learning
5. On-line courses
6. Active learning
7. Additional information

The collected information will allow to elaborate an action plan aimed at:

- Identifying the needs for upgrading existing - or creating new - facilities at each partner institution.
- Identifying the most suitable multimedia/digital tools for 'real-time' and/or 'on-demand 'contents, as well as the most suitable strategy to support both teacher/student and student/student interactions.
- Displaying the existing courses, seminars and cross-cutting activities provided in E-learning mode by each partner, where we conducted survey on teaching practices.

Key findings indicate that data on digital and multimedia tools, organizational structures, cultural perspectives, and past and future experiences suggest that consortium member institutions share a common history and set of guidelines for facilitating student-faculty interaction. The use of pilot experiences indicates the possibility of synergies and linkages that may be evaluated and developed across the institutions.

The survey's findings imply that major infrastructure obstacles should not stand in the way of a cooperative education program built on distributed competence-based instructional modules. The common platform among the partners is Moodle. All partner institutions prefer hybrid teaching combining e-learning with face-to-face learning. While all the consortium's institutions employ e-learning systems for their BS and MS programs, only BOKU and HOH go so far as to use them for PhD programs and lifelong learning. According to the survey results, all partner institutions implement asynchronous teaching and learning and BOKU is the only institution that prefers asynchronous e-learning. When it comes to videoconferences, the TEMS is preferable, and the platforms are formally designated in each of the consortium's institutions. Active learning approaches are implemented at all partner institutions listing some most common teaching strategies.

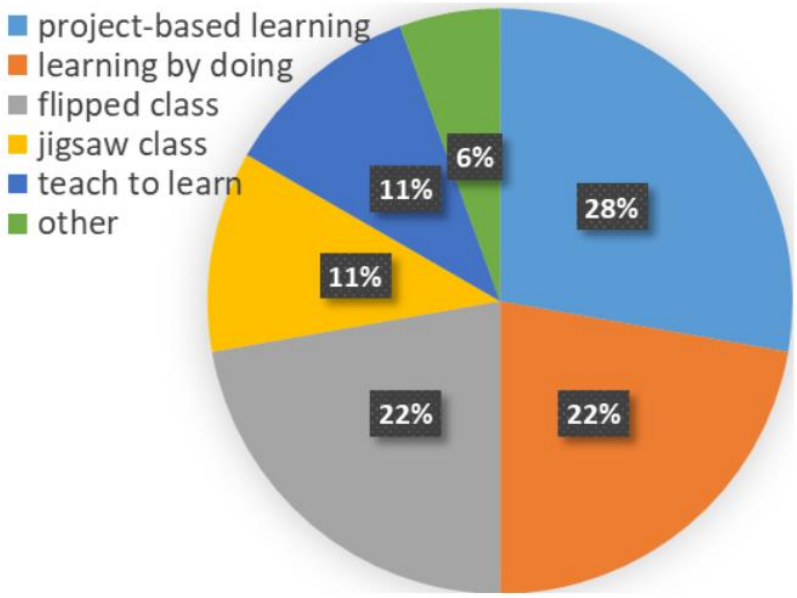


Figure 6: PR5 results

According to the results, the most common teaching strategy among the partners is project-based learning (28%), followed by the flipped classroom (20%) and learning by doing (20%). In the cluster "other type of active learning", teaching strategies were brainstorming, discussing, group work, case study learning, practical classes, team-based learning, and lots of different everyday teaching methods with active elements.

4.2 Teaching strategies as a new perspective – guidelines

There are numbers of strategies and methods of student-centred learning that range from personalized learning, problem solving learning, flipped classrooms and others.

> *"Teaching strategies/methods of the teachers reflect what they value in education, how their students comprehend their subjects with more ease and interest and what teaching methods they believe are effective"*[15]

For defining and describing a good teaching strategy and practices, for the teacher it is very important to consider key dimensions containing indicators (see Table 2). These dimensions are the main variables that instructors/teachers should consider when choosing to implement a teaching strategy in their classroom and compare it to another.

Table 2: Key dimensions and indicators for a good teaching strategy

Dimensions	Some indicators for preparing a good strategy
Context	The context is part of the learning environment, and it affects students' learning and performance. It is focused on: • the classroom setting: characteristics of the rooms, positions of tables and chairs. • the course typology (bachelor's, master's, other contexts). • class size, because some strategies could be difficult to apply consistently in medium to large classes, whereas others can be applied in classes of all sizes.
Purpose/aim	Defining the aim of the strategy helps the user to understand the level of alignment that can be created between strategy, content and learning outcomes. It also reflects the teachers' philosophy of teaching and learning.
Description of teaching strategy	The description includes focus on some factors: • Preparation of the strategy (setting, materials). • Procedures of implementation. • Class time and time management. • Class management.

[15] Fedeli, M., Tino, C. (2020). *Guidelines on teaching practices, A guide for instructors and practitioners to innovate practices in higher education and adult learning, Pensa MultiMedia Editore s.r.l. 73100 Lecce* https://www.uni-wuerzburg.de/fileadmin/0603 *intall/IO2_Learning_community/Online_Teaching_Guideline/E-BOOK-published_guideline.pdf*

	• Interactive strategy used (e.g. pair-small group, discussion, role-play, jigsaw …).
Material required	The description of necessary materials can be considered one important aspect of setting preparation. Providing readers with the list of materials helps them assess the feasibility of the practices in their own contexts.
Theoretical framework	The identification of theoretical framework offers both authors and readers the opportunity to reflect on their own teaching and learning perspectives.
Risks and advantages	For each practice, the risks and the advantages of using it can described. These aspects help readers understand whether they might face the same challenges and, if so, how to mitigate them, or whether only the advantages will matter in their context.
Possible variations and different contexts	This dimension shows other possible ways of implementing the same practices.
Recommendations	Tips to improve the implementation of the practices.
Evidence	The authors are free to upload some evidence and examples (posters, pictures…) on the strategy presented

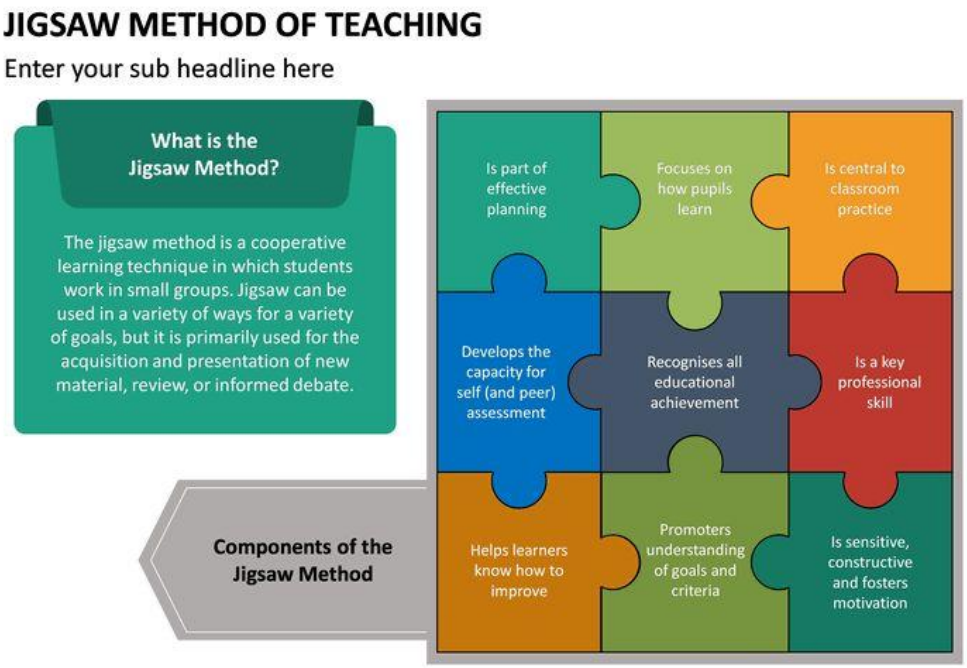
Following the PR5 results on active learning and teaching strategies among the partners, collection of teaching practices based on desk-top research was grouped and described (see Table 3)

Table 3 Teaching strategies and practices description

Categories	Description
Strategies involving small/large group discussions	Teaching practices that require interaction in small or large groups carrying out a task. Small group work enables students to learn how to work in a team, in the process of which they identify and fill the gaps in their knowledge. **<u>Teaching practices:</u>** *Jigsaw* *International variation of the group puzzle* *Academic knowledge meets practice* *Seminar group discussion* *Dialogical assessment and feedback method* *Observation & reflection* *Reflect* *Consensus workshop*
Project work strategies	Teaching practices that require not only group activity and knowledge sharing but also designing and delivering a product. **<u>Teaching practices:</u>**

	Project work discussion *Design thinking* *Writing-based learning* *Mixed methods group presentations*
Conversational strategies	Teaching practices carried out in response to a debate around a stimulus (e.g. world café, role-play), where everyone participates by making use of transversal knowledge, integrating, expanding, arguing what has already been said by others. **<u>Teaching practices:</u>** *World café methodology* *Combined world café methodology & intergenerational learning together* *Role-play*
Flipped classroom strategies	Teaching strategies that require students to present content to the class after working on materials assigned by the teacher individually or in groups. **<u>Teaching strategies:</u>** *Reflective understanding of roles and functions of international organizations of adult education* *Current issues in adult learning and education*
Case-based strategies	Teaching strategies that explicitly refer to a case study or that require learners to identify a solution through group discussion. **<u>Teaching practices:</u>** *Case study (a)* *Case study (b)*
Metaphorical reflective strategies	Teaching strategies that support students in their reflection process. They involve the use of pictures that students can use to metaphorically explain their thoughts on pretty much any kind of learning or situations/ experiences. *Photo-language (a)-activity that combines photo and language, a visual method that facilitates speaking on a given subject.* *Photo-language (b)*
Icebreaking strategies	Strategies used to introduce each other and to develop a group atmosphere, reducing distances between people. **<u>Teaching practices</u>**: *Things that we share* *I AM*

Jigsaw Teaching Method



World Cafe Teaching Method

Photolanguage Teaching and Learning Method

The common dimensions of these strategies are:

- Active learning through digital technologies and fieldwork
- Creating a learning environment where the students are aware of what and why they are doing it
- Interactions and discussions
- Transversal skills development
- Awareness of learning benefits beyond the university, focusing on professional career

Whatever the teaching method is used by the teacher, the most important aspect is to ensure an active role for the learner. Not all students are motivated to learn in the same way, so different incentives or a combination of incentives may be required in different cases. In such learning environment students can build knowledge and develop and experiment with skills useful for life and work.

To effectively implement the teaching methods, the teachers need to follow some important steps such as:

1. ***Defining the learning outcome*** - Defining a clear learning objective helps teachers to choose the strategy that is better aligned with the content and learning outcomes.
2. ***Why this strategy?*** - It is important to ask yourself how the chosen strategy can help students/learners to achieve the learning outcomes.
3. ***Check the feasibility of teaching practice*** - Identify the strategy that is better suited to the objectives, class size, resources and the time available.

Open education and active learning

Open education uses more open forms of education such as active learning, cooperative-learning, and student-centred classrooms. This innovative pedagogical approach emphasizes individualized learning, student orientation, and learner autonomy leading students to become more autonomous human beings. When it comes to active learning, there are aspects to distinguish between behavioural and cognitive dimensions.

The behavioural dimension of active-learning pedagogies focuses on the degree to which instructional practices enable students to engage in verbal or physical behaviour (hands-on activities). The cognitive dimension highlights the degree to which teaching strategies and approaches enable students to engage in various forms/levels of thinking.

Opposite to the traditional way of teaching and learning where the students passively learn from their instructors, the active learning motivates student to engage in the activity and the learning process requiring students to solve problems, answer questions, formulate questions of their own, discuss, explain, debate, or brainstorm during class. Active learners are characterized as proactive, self-motivated, self-regulated, independent, responsible and reflective and can provide higher-order thinking tasks such as analysis, synthesis, and evaluation.

5.1 Active Learning

Active Learning includes several indicators reflecting a holistic approach[16]:

- ***Doing****:* in an active learning process students practice their knowledge and experience their skills
- ***Feedback and feedforward****:* formative processes that help students to improve their knowledge and skills
- ***Interaction and communication****:* students share knowledge, experiences, points of view or debate topics, contents, or problems
- ***Reflection****:* students can reflect on their learning at personal level or with the whole group

These holistic perspectives of Active Learning engage the whole person (e.g., body, mind, emotions and learning style) involving different variables:

- ***The context of learning***: it is part of the learning process and impacts students' learning process and performance

[16] Fedeli, M., Tino, C. (2020). *Guidelines on teaching practices, A guide for instructors and practitioners to innovate practices in higher education and adult learning, Pensa MultiMedia Editore s.r.l. 73100 Lecce* https://www.uni-wuerzburg.de/fileadmin/0603 *intall/IO2_Learning_community/Online_Teaching_Guideline/E-BOOK-published_guideline.pdf*

- ***The experience of learners***: in such a learning environment the students share with the others their previous experience and knowledge through peer-to-peer interaction

- ***Students' intelligence style***: the variety of activities, innovative tools, teaching strategies enable and create interception of the different students' intelligences in the class

- ***The role of the teacher:*** he/she chooses not to be a "sage on the stage" but "a guide on the side", as the facilitator of learning. He/she focuses not on the traditional lecture but on planning the learning environment, activating the students, and giving effective, real-time feedback. Teachers motivate students to participate in activities that teach them how to accurately assess themselves and their peers.

Curriculum design and use of learning outcomes – approach towards micro credential development

Considering the SCL approach in curriculum design, it is important to incorporate the idea that students have a choice in what they want to study and how to study. Allowing this dimension of flexibility and the active role of students in the curriculum design, modularisation (modules or micro credentials) and the use of credits (ECTS) indicate the shift of emphasis toward learner needs. The emphasis is on process and competences rather than on subject content.

Learning outcomes are used for a wide range of purposes and by a wide variety of users. The learning outcomes are reflecting and defining different needs in their description (format, length and detail). The EQF level descriptors-qualifications frameworks provide a general reference for comparing qualifications and distinguishing levels. Learning-outcomes-based curricula and assessment specifications must be defined and written in a way that considers learners and teachers needs and adds value to the learning process.

6.1 Learning outcome's purpose from different perspectives

The Learner Perspective: Learning outcomes statements clarify what a learner is expected to know and be able to do and understand, having completed a learning sequence, a module, a programme or a qualification***.***

The Teacher Perspective: The learning outcomes approach helps to orient and direct teaching, to select methods and to motivate the student/learner throughout the learning process. Learning outcomes statements, by indicating the scope of knowledge and skills to be addressed and the level of performance to be achieved, are crucial for planning and organising teaching and learning***.***

The Assessor Perspective: The learning outcomes should clarify the assessment criteria for success/failure and performance. They should also clarify the area of learning being assessed, indicating what is relevant and not.

The Training Provider Perspective: The learning outcomes serve as a tool for developing and reviewing programmes and qualifications. This perspective provides the basis for dialogue and cooperation with the labour market and society stakeholders regarding evolving skills needs and gaps.

The Labour Market Perspective: The learning outcomes serve as a response to the evolving skills needs allowing different stakeholders in education and training, as well as the labour market and society at large to participate in defining learning outcomes. Furthermore, creating the feedback loop based on learning outcomes opens the dialogue regarding up/re skilling between the world of education and the world of work.[17] (Figure 5)

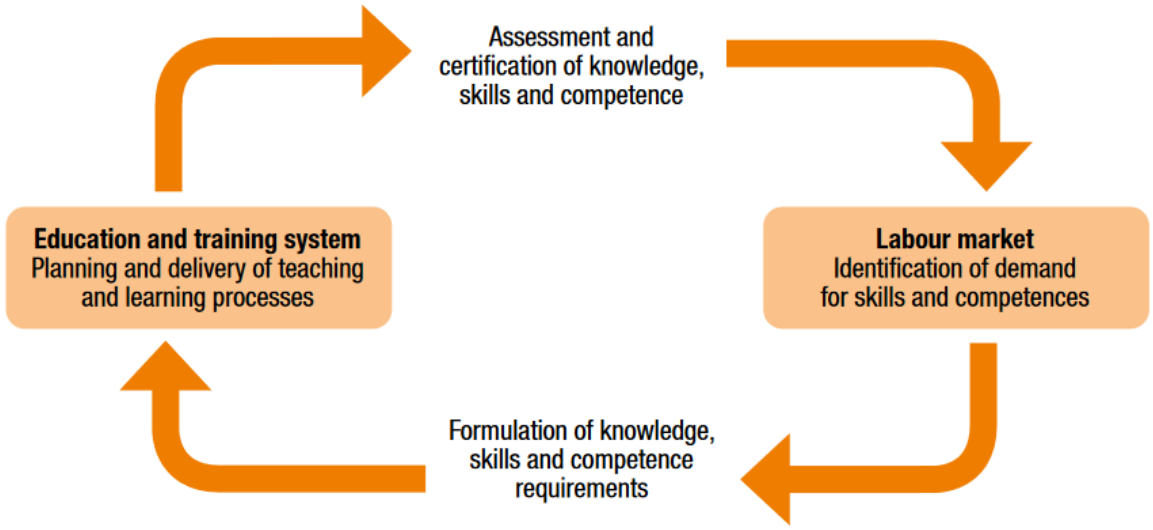


Figure 7: The feedback loop education-training and labour market

The learning outcomes are seen as tools to increase overall qualifications transparency and reduce barriers to transfer and progression across institutional and national borders.

6.2 Instruments in a correlation with Learning Outcomes

There are several instruments standing in a correlation with learning outcomes reflecting relationship between each other, dependency, challenges and impact.

Qualification Framework

Qualifications frameworks play an important role in directing learning outcomes at international, national and sector levels. The adoption of the European Qualification Framework in 2008 influenced the introduction of national frameworks in all EU countries. The Learning-outcomes-based frameworks are important tools to increase transparency and to allow for comparison of qualifications across institutional and national borders. The learning outcomes descriptors in qualifications frameworks are normally designed using a horizontal axis identifying learning domains such as knowledge, skills and competence and a vertical dimension indicating how the complexity of learning increases from level to another (Table 4). A national qualifications framework can operate with less generic and more specialised descriptors.

[17] Cedefop (2022). *Defining, writing and applying learning outcomes: a European handbook - second edition.* Luxembourg: Publications Office of the European Union. http://data.europa.eu/doi/10.2801/703079

Following a German example, the German qualifications framework draws the distinction between professional and personal competence.

In this case, 'competence' is considered an overarching concept, influencing the way learning outcomes are defined and described in the level descriptors (Table 5). By differentiating between professional and personal competence and showing how knowledge (of varying depth and breadth), skills (instrumental and systematic, linked to judgement), social competence (communication, teamwork, leadership and involvement) and autonomy (autonomous responsibility, learning and reflectiveness) the emphasis is on the overall competence of the individual and the holistic character of the term.

Table 4 Main elements of EQF descriptors

Knowledge	Skills	Responsibility and autonomy
In the context of EQF, knowledge is described as: • **theoretical and/or** • **factual**	In the context of EQF, skills are described as: • cognitive (Involving the use of logical, intuitive and creative thinking) • practical (Involving manual dexterity and the use of methods, materials, tools and instruments)	In the context of the EQF, responsibility and autonomy are described as the ability of the learner to apply knowledge and skills autonomously and with responsibility.

Table 5: Level of descriptors in the German qualifications framework for lifelong learning

Professional competence		Personal competence	
Knowledge	**Skills**	**Social competence**	**Autonomy**
Depth and breadth	Instrumental and systemic skills, judgment	Team/leadership skills, involvement and communication	Autonomous responsibility/ responsibility, reflectiveness and learning competence

Source: The German qualifications framework for lifelong learning (DQR, 2011).

6.3 Curricula

Learning outcomes influence the definition and design of curricula and provide a structure for student learning. The advantage of detailed learning outcomes specifications is to give a clear steer to teachers, assessors, learners and future employers. The learning process can not be predictable and that is why it is important to include flexibility into the curricula design. There are various benefits of the learning-outcomes based curricula[18]:

[18] Cedefop, 2022.

- Help to provide clarity, integration and alignment within and between a sequence of courses
- Promote a learner-centred approach to curriculum planning
- Encourage a self-directed and autonomous approach to learning, as students can take responsibility for their studies, and are actively able to gauge their progress
- Promote a collegial approach to curriculum planning, as instructors collaborate to identify gaps and redundancies
- Ensure that decisions related to the curriculum and learning environment are streamlined
- Foster a philosophy of continual monitoring, evaluation and improvement
- Help to ensure accountability and assure quality of education programmes

Qualification Standards

Qualification standards define the expected outcomes of the learning process, leading to the award of a full or partial qualification. Here the individual is focused on qualification (individual learning paths) rather than full program. All these aspects provide a path for validation process of non formal and informal learning.

In vocational education and training, qualifications standards normally answer questions such as what the student needs to learn to be effective in employment and 'what the learner needs to learn to become an active citizen, supporting basic human and democratic values? Here is the focus on transversal skills and competences, for example related to communication, social skill and problem-solving.

Occupational Standards

Occupational profiles or standards are usually set outside the education and training system, by labour market stakeholders, but can have significant impact on the way learning outcomes statement is defined and written.

Assessment Standards

Assessment standards must describe the requirements precisely to the learner. These requirements normally support summative assessments at the end of the learning process and formative assessments including feedback that can be used by teacher to improve their teaching or by students to improve their learning.

Argument-based Curriculum

One of the special forms of designing a curriculum in the SCL approach is an argument-based curriculum. SCL approach directs students to search for answers and solutions on their own and

by doing and enables them to define these answers and solutions. Argument-based curriculum foster peer learning, peer-to-peer dialogue and self-study methods and can be applied across multiple disciplines. It is particularly effective in improving students' performance in argumentative essays. In such learning environment, students can improve cognitive, meta-cognitive, epistemological, communication and socio-emotional skills.[19]

The definitions and descriptions of learning outcomes as used in qualifications frameworks, qualification standards and curricula are statements and expressions of intentions. They are not outcomes of learning, but desired targets. Achieved learning outcomes can only be identified following the learning process, through assessments and demonstration of achieved learning in real life, for example at work.

- Cedefop, 2022

6.4 Definition and Writing Learning Outcomes

There are two main, interrelated definitions of learning outcomes:

1. *learning outcomes are 'knowledge, know-how, information, values, attitudes, skills and/or competences a person has acquired and/or is able to demonstrate after completion of a learning process, either formal, non-formal or informal'*[20]

2. *learning outcomes are 'statements regarding what a learner knows, understands and can do on completion of a learning process, which are defined in terms of knowledge, skills and responsibility and autonomy'*[21]

[19] Kuok Ho, D. T. (2023). Student-centered Approach in Teaching and Learning: What Does It Really Mean? *Acta Pedagogia Asiana*, *2*, 72–83. https://doi.org/10.53623/apga.v2i2.218

[20] *Cedefop, 2022.*

[21] Union, P. O. of the E. (2017, May 22). *Council recommendation of 22 May 2017 on the European Qualifications Framework for lifelong learning and repealing the recommendation of the European Parliament and of the Council of 23 April 2008 on the establishment of the European Qualifications Framework for lifelong learning [Website]. Publications Office of the EU; Publications Office of the European Union.* *https://op.europa.eu/en/publication-detail/-/publication/ceead970-518f-11e7-a5ca-01aa75ed71a1/language-en*

Table 6: Differences between the intended and achieved learning outcomes

Intended learning outcomes	Achieved learning outcomes
• are related to principles and concepts • might be observed: NQF descriptors, curricula, qualification descriptions, standards • have formal meaning • people involved in developing learning outcomes are defining their shape. Those people are specialists in writing learning outcomes in general. They include researchers, specialists from national/regional authorities for education	• are related to theory and practice • might be observed (or rather are the result of) training and assessment process • have practical meaning • people involved in developing learning outcomes are defining their content. Those people are specialists in defining and providing learning outcomes for a particular sector/ occupation. They include practitioners, education providers, social partners, sector representatives
Balance and comparability between intended and achieved is ensured when they are working together. In this way, flexibility and adaptability of learning outcomes as well as fulfilment of different aims of using learning outcomes is also ensured.	

The EQF guidance note on using learning outcomes[22] states that the definition and writing of learning outcomes refers to taxonomies of learning based on a hierarchy of conceptual stages of learning processes that learning outcomes can be used to describe.

Bloom's taxonomy is one of the most important theoretical influences on thinking about learning outcomes and progression including revised cognitive, psychomotor and affective domain (Figure 6)

[22] *Annual work programme 2011—Lifelong learning programme—European Commission*. (2011). Retrieved 5 August 2024, from https://commission.europa.eu/publications/annual-work-programme-2011-lifelong-learning-programme_en

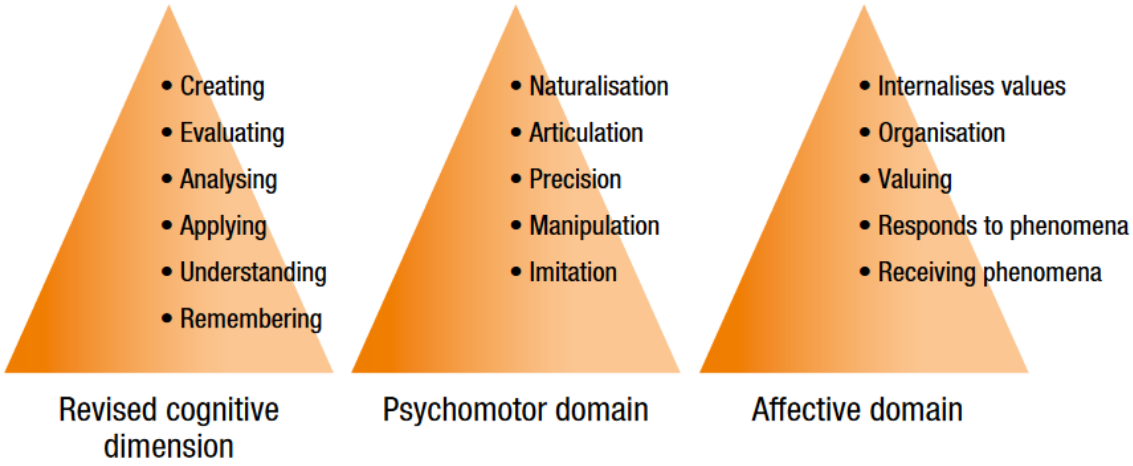


Figure 8: Bloom´s taxonomy

When writing learning outcomes, it is always important to put the learner into a centre and to keep simplicity, starting with overall objectives towards specific statements for units and assessment. Limiting the number of statements makes it easier for the learner to manage learning. Furthermore, it makes it easier to plan teaching, to facilitate learning and, to carry out assessment. Regarding the use of action verbs in the learning outcomes statements, it is recommended to use only one action verb for each learning outcome.

Guidelines when writing learning outcomes:

- Qualification/programme or a qualification unit/course: the number of statements used should be carefully considered. When defining a course or unit it is generally recommended to limit the number of statements.
- Full qualification or a programme: it is generally recommended to keep the number of statements as few as possible. The purpose should be to identify the overall scope and profile, not to list all technical details.
- Statement: it is recommended to focus on the learner and start with an action verb, followed by the object of the verb as well as a statement specifying the depth/breadth of learning to be demonstrated, and complete with an indication of the context. This can be related to learning, work or other relevant social contexts.

6.5 The vertical and horizontal dimensions of learning outcomes statements

Learning outcomes statements, combining action verb/object/context, need to be articulated along vertical and horizontal dimensions. The vertical dimension is related to the complexity of learning and action verbs play a key role supported by a specific objective and context. An active verb can be used in a different EQF level descriptor (4-7). Ambiguous verbs should be avoided. Table 7 shows the difference between ambiguous and less ambiguous used verbs in the learning outcomes statements. The vertical dimension is presented and illustrated in a form of hierarchy by the EQF level descriptors. Regarding vocational education, vocational qualifications in principle can be awarded at all levels, including level 8 of the EQF[23].

The EQF descriptors illustrate how growing complexity can be expressed through the interaction between action verbs and a specification of object and context. Qualifications framework descriptors are written to fit a wide range of institutions, qualifications and programmes.

Table 7: Differences between ambiguous and precise verbs

Ambiguous		Precise	
• Know • Understand • Enjoy • Determine • Appreciate	• Grasp the significance of • Become familiar with • Believe • Be aware of • Comprehend	• Distinguish between • Differentiate • Assemble • Adjust • Identify • Solve	• Write • Recite • Construct • Contrast • Compare • List

Regarding the horizontal dimension in learning outcome statements, it is important to consider several key questions such as:

- Are we, for example, focusing mainly on theoretical knowledge or are we addressing practical or analytical skills?
- What part of an occupational area are we addressing?
- Are we focusing entirely on isolated tasks or are we also addressing the broader context of these tasks?
- Should a trainee bricklayer only learn to put brick on brick, or should he/she also learn the complexities of cooperation at a building site?

Action verbs still play important role but are supported with aspects considered in the Blooms´s taxonomy and can be adjusted at national level and with specifications[24] (Table 8)

[23] Cedefop, 2022.
[24] Ibid.

Table 8: Domains of learning with common verb associations

Domain of learning	Levels of sophistication	Common verb associations
Cognitive (knowledge) What will students know?	Remembering, understanding, applying, analysing, evaluating, creating	Define, identify, describe, differentiate, explain, apply, analyse, resolve, justify, recommend, judge, create, design
Psychomotor (skills) What will students be able to do?	Imitation, manipulation, precision, articulation, naturalisation	Adapt, arrange, build, calibrate, construct, design, deliver, demonstrate, display, dissect, fix, mimic, operate, sketch, use, perform
Affective (attitudes, values or habits of mind) What will students value or care about?	Receive, respond, value, organise, characterise	Ask, challenge, demonstrate, discuss, dispute, follow, justify, integrate, practise, judge, question, resolve, synthesise

While the cognitive and psychomotor dimensions reflecting knowledge and skills are described in all EQF and NQF descriptors and curricula and qualification standards, the third dimension reflects personal development and is not always the responsibility of formal teaching and learning.

6.6 Description of the eight EQF levels

Each of the 8 levels of the EQF is defined by a set of descriptors indicating the learning outcomes relevant to qualifications at that level in any qualifications system. Table 9 illustrates the description of the EQF level 7 and 8 describing the master and PhD level of achievements.[25]

The learning outcomes are defined in terms of:

- **Knowledge**: in the context of EQF, knowledge is described as theoretical and/or factual.
- **Skills**: In the context of EQF, skills are described as cognitive (involving the use of logical, intuitive and creative thinking) and practical (involving manual dexterity and the use of methods, materials, tools and instruments).
- **Responsibility and autonomy**: In the context of the EQF responsibility and autonomy is described as the ability of the learner to apply knowledge and skills autonomously and with resposibility.

[25] *Description of the eight EQF levels | Europass*. (n.d.). Retrieved 5 August 2024, from https://europass.europa.eu/en/description-eight-eqf-levels

Table 9: EQF7 and EQF 8 learning outcomes descriptions

Level 7 - learning outcomes

Knowledge	Skills	Responsibility and autonomy
Highly specialised knowledge, some of which is at the forefront of knowledge in a field of work or study, as the basis for original thinking and/or research Critical awareness of knowledge issues in a field and at the interface between different fields	Specialised problem-solving skills required in research and/or innovation in order to develop new knowledge and procedures and to integrate knowledge from different fields	Manage and transform work or study contexts that are complex, unpredictable and require new strategic approaches; take responsibility for contributing to professional knowledge and practice and/or for reviewing the strategic performance of teams

Level 8 - learning outcomes

Knowledge	Skills	Responsibility and autonomy
Knowledge at the most advanced frontier of a field of work or study and at the interface between fields	The most advanced and specialised skills and techniques, including synthesis and evaluation, required to solve critical problems in research and/ or innovation and to extend and redefine existing knowledge or professional practice	Demonstrate substantial authority, innovation, autonomy, scholarly and professional integrity and sustained commitment to the development of new ideas or processes at the forefront of work or study contexts including research

Table 10: Overview of guidance material supporting the writing, definition and use of learning outcomes

General characteristics of existing guidance material		
Learning context	**Issuing institutions (higher education/ regional authority; national authority; or others)**	**Description of guidance material, (title of document in the original language, English translation, hyperlink)**
Austria		
VET	Federal Ministry of Education, Science and Research (formerly Federal Ministry of Teaching, Arts and Culture)	*(2011) Broschüre Bildungsstandards: Soziale und personale kompetenzen, 9.-13. Schulstufe [booklet on educational standards: social and personal competences 9-13th grade].* https://www.bildungsstandards.berufsbildendeschulen.at/sites/default/files/broschuere/BBS-Bildungsstandards-Broschuere-Soziale-und-Personale-Kompetenzen.pdf
	Federal Ministry of Education, Science and Research (at time of publication Federal Ministry of Education and Women)	(2015) *Bildungsstandards in der Berufsbildung: Projecthandbuch [educational standards in vocational education: project manual]* https://www.bildungsstandards.berufsbildendeschulen.at/sites/default/files/files/BBS-Bildungsstandards-Handbuch-BIST-15.10.2015.pdf
HE	University of Technology, Vienna	(2018) *Leitfaden zur Studienplan-Erstellung für Bachelor- und Masterstudien [guideline for curricula development of Bachelor- and Master programmes].* https://www.tuwien.at/index.php?eID=dms&s=4&path=Satzung/Studienplan-Erstellung%2520Leitfaden.pdf Teaching Support Centre – Individual Consultation: https://tsc.tuwien.ac.at/beratung-und-training/beratung-zu-lernergebnisorientierung/
	Vienna University of Economics and Business	(2019) *Teaching and Learning Academy: Learning Outcomes.* https://learn.wu.ac.at/open/tlac/learningoutcomes

Quality assurance through evaluation and assessment – the quality standards of a SCL approach for the micro credential development

Intended learning outcomes can only be achieved and visible through assessment and/or through demonstration of achieved learning. Considering some aspects such as that learning outcomes provide a reference point for formative/ summative assessment and the validation of non-formal and informal learning, the focus should be on individual achievements, not on the teacher's methods and approaches.

Continuous dialogue and balance between the expected and achieved learning outcome should be monitored and improved. Learning outcomes should be continuously reviewed and improved and for these reasons writing the learning outcomes should involve diverse stakeholders' groups.

Extensive collaboration among teachers from different fields can make positive contributions to flexible learning pathways. When writing an assessment criteria, assessment criteria are generally designed to be more specific than the expected learning outcomes of a qualifications and a module (micro credential). Learning outcomes should be measurable in a way that the learner is able to demonstrate achieved learning in an observable way.

Assessment criteria also need to consider ethical boundaries, and this is an area associated with the growing importance of transversal skills and competences, often closely related to the personal characteristics of the learner.

Ensuring quality in the assessment of the learning outcomes, the instructors need to be aware to consider 5 principles: comparability and consistency, accountability, transparency, and involvement described in the Table 11.

Table 11: Principles to ensure quality of student's assessments

Comparability and Consistency	**Employing assessment strategies and procedures which:** ➢ **Focus on learning outcomes** ➢ **Are applied equitably and constituently across disciplines and the institution** ➢ **Allow for comparability.**
Accountability	All individuals and committees involved in assessment need to be aware of, and act in accordance with, their specific and identifiable responsibilities
Transparency	This involves the following components: ➢ Making the assessment strategy used for a programme clear and easily available to all staff and students involved ➢ Informing students on the form and extent of assessment they will be subject to and what will be expected of them ➢ Making the criteria used available to all staff and students involved and relevant to the programme's learning outcomes

Involvement	All staff involved in the delivery of a programme, or its parts need to be involved in the design and implementation of the overall assessment strategy and students must have the opportunity to offer their views on the amount and type of assessments they undertake and whether they are regarded as both ›fair‹ and ›effective‹ measures of their learning and abilities.

It is recommended in implementing assessment practices to ensure that assessment is:

1. Carefully designed and proportionate
2. Reviewed on a regular basis, including feedback from students
3. An integral part of, and a contributor to, the teaching process
4. Focused on identified learning outcomes
5. Based on objective criteria made available to all staff and students involved
6. Subject to quality assurance at programme and institutional levels

Student-Centred Feedback

In the SCL environment it is recommended for teachers to provide student-centred feedback. This type of feedback can be provided for students in a form of writing the task where the students are actively engaged in writing, thinking and reflecting their work. The students receive feedback that shows their improvement in writing tasks and the students become aware of what they have done well and what they have not done well.

A Learner Centred Approach to Online Education containing Micro Credentials

Online education and E-learning utilize the internet for course delivery including assignments and assessment with the student and educator. Educators, instructional designers, and course developers use electronic devices and internet technologies to deliver a variety of solutions to enable learning and improve performance. Course content can be presented through recorded lectures, slide presentations, text-based documents, interactive online activities of various forms, audio files, video files, pod casts, wikis, live chat sessions, online discussions, live online presentations, video conferencing, and other methods.

Among the student needs, online education is also used to meet other educational needs such as training and professional development needs. Professionals utilize online education to meet continuing education needs. Professional students are seen as lifelong learners and share some characteristics that are different from those of full-time students. These aspects influence the design of learning programmes. For lifelong learners it is particularly important to know the benefits of learning. These types of learners also show some characteristics that are relevant for the programme and learning outcomes design:

- Like to learn experientially
- Approach learning as problem-solving
- Learn better when they can see the immediate value and application of content
- Prefer to study at a time, place and pace that is convenient for them

While traditional methods can reach a limited number of students per year, the participation via e-learning can consists of thousands of people throughout the world reflecting a highly cost-effective method of teaching and learning in the longer term.
E-learning can reach a wide target audience, including learners who are:

- Geographically dispersed, with limited time and/or resources to travel
- Busy with work or family commitments, which do not allow them to attend courses on specific dates with a fixed schedule
- Contingent workers, such as consultants, professionals working part-time, independent contractors
- Located in conflict and post-conflict areas and/or restricted in their mobility due to security reasons
- Limited from participating in classroom sessions due to cultural or religious beliefs facing difficulties with real-time

E-learning is a flexible learning path that allows the use of a variety of instructional methods, the combination of collaboration activities with individual learning, and the personalization of learning paths based on learners' needs communication (e.g. foreign language).

Quality online courses and teaching should be learner-centred and create an environment for interaction, practice and feedback.

A disadvantage for a student in such a learning environment can be fear of technology causing anxiety. On the other hand, online education requires a different approach to course development; course design; educator roles; learning and teaching activities; and assessment activities than traditional education that might be complicated for a teacher. Some educators may not wish to approach this type of education or may not have the required skills and competences.

The role of an online teacher can be course facilitator, mentor, and moderator and should promote active learning. Furthermore, an online teacher needs to possess competences and knowledge:

- Technology for online courses
- Knowledge in educational theory and practice, instructional design principles, and possess good research skills
- Online teaching strategies and methods
- Communication and management skills

Online readiness quizzes can be helpful in preparing to learn or teach online. It is recommended that institutions require online readiness quizzes for all students and educators interested in participating in an online learning experience.

8.1 Guidelines on e-learning course development

Activities for the development of e-learning can be grouped into five main categories: analysis, design, development, implementation, evaluation reflecting variety of requirements.[26](Figure 7)

1. Analysis – need analysis, target audience and task analysis for the courses designed for the specific job-related skills. Need analysis is a starting point when it comes to the identification of gaps and needs.
2. Design – learning objectives, defining the order in which the objectives should be achieved, selecting instructional, media, evaluation and delivery strategies
3. Development – content, storyboard, courseware
4. Implementation – managing and facilitating learners 'activities
5. Evaluation – learners´ achievements, the achievements of learning objectives, the transfer of job –related knowledge/skills

[26] *E-learning methodologies and good practices*. (n.d.). FAO Elearning Academy. Retrieved 5 August 2024, from https://elearning.fao.org/course/view.php?id=819

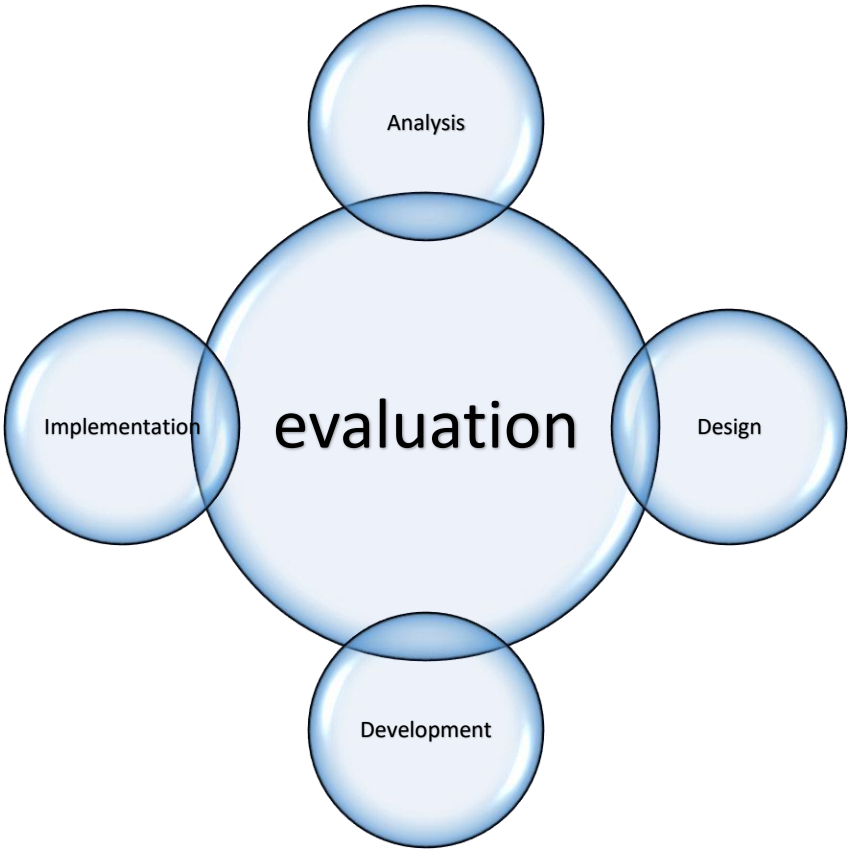


Figure 9: Activities for the development of e-learning

Designing an e-learning course also requires a properly skilled team with different roles such as project manager; instructional designer; subject matter expert; e-learning course developer and graphic designer, learning management system administrator, online facilitator and tutor.

The use of technology is needed to create e-learning material to be accessible to learners. Some formats use learning management or other types of learning platforms to track and administer learners' activities and manage e-learning content. For a successful e-learning approach it is recommended to create the services of e-tutoring, e-coaching, e-mentoring. These services provide individual support and feedback to learners through online tools and facilitation techniques.

Tutoring *is provided by a tutor or facilitator to support learners in completing activities throughout the course.*

Coaching *is a task-oriented service to support the development of specific skills; it is normally provided by a subject matter expert over a short-term period.*

Mentoring *is a longer-time service to support future learners' development. For example, it can support the transfer of acquired knowledge and skills to the job context.*

Regarding the content development for e-learning formats, there are six main types of content including facts, procedures, principles, concepts, interpersonal skills, and attitudes explained in the Table 10.

Table 12: Types of learning content

Types of learning content	
The following classification[10] identifies six main types of content: facts, procedures, concepts, principles, interpersonal skills and attitudes.	
Facts	Unique, specific information that answers the questions: who, where, when? Facts are shown, exhibited or indicated. Examples: data, lists, historical events
Procedures	A procedure is a series of clearly defined steps, aiming to perform a task. Procedures answer the question: 'How to ...?' Example: 'instructions for compiling an Excel spreadsheet'
Concepts	A concept is a group of objects, entities or ideas that: are defined by a single word or term; share common characteristics; differ in unimportant characteristics; require a definition; and answer the question: 'What is ...?' Example: the concept of 'climate change'
Principles	A principle (or rule) describes a relationship between two concepts. For example: 'As price increases, the supply increases'. Some principles can be translated into strategic guidelines that can guide decisions and complex tasks. Example: 'guidelines for facing price volatility'.
Interpersonal skills	Verbal and non-verbal skills for interacting with other people. For example, content related to 'negotiating' or 'solving group conflict'.
Attitudes	Predispositions to behaviour. Example: content related to appreciate the 'importance and urgency of adopting measures for

Choosing the knowledge for an e-learning content can be done from existing source materials or created from scratch. For a 30 min e-learning lesson the following is recommended: 30 screens (1 min per screen), 8-10 pages of content.

8.2 Relationship between teacher and learner

In an online environment there is a development of different skills[27]:

Cognitive skills, which involve increasing knowledge and comprehension (e.g. scientific concepts), following instructions (i.e. procedural skills) and applying methods in new situations to solve problems (i.e. thinking or strategical skills).

Interpersonal skills, such as those involved in active listening, presenting or negotiating.

Psychomotor skills, which involve acquiring physical perceptions and movements (e.g. playing sports or driving a car).

For designing a course, choice of teaching and learning methods, it is important to consider learner characteristics, cognitive styles, learning styles, and multiple intelligences. Some learner characteristics to be considered include age, cultural background, educational background, occupational background, technical abilities, cognitive styles, learning styles, and multiple intelligences.

Cognitive styles and learning styles can significantly impact the learning process and the learning outcomes and can involves attending, perceiving, remembering, and thinking. Learners can have a different learning style and therefore it is important for teachers to provide content in several formats and have a variety of teaching strategies to address all learning styles and individual differences among students. The learning style prefered by the learner can be:

- Visual - The learner and teacher can use pictures, charts, maps, diagrams, tables, spreadsheets, and flash cards to facilitate learning.
- Auditory - The learner and teacher can use video with audio and recorded lectures to facilitate learning. Other learning and teaching strategies that can accommodate the auditory learner include discussions, debates, oral presentations, reading flash cards out load, verbal games, demonstrations, and peer teaching.
- Tactile – The learner and teacher can use active learning and note taking, dance, games, field trips, and role playing.
- Kolb's Learning Styles[28]- The four stages of learning are: concrete experience, reflective observation, abstract conceptualization, and active experimentation:

[27] *E-learning methodologies and good practices*. (n.d.). FAO Elearning Academy. Retrieved 5 August 2024, from https://elearning.fao.org/course/view.php?id=819

[28] *Kolb's Learning Styles & Experiential Learning Cycle*. (2024). https://www.simplypsychology.org/learning-kolb.html

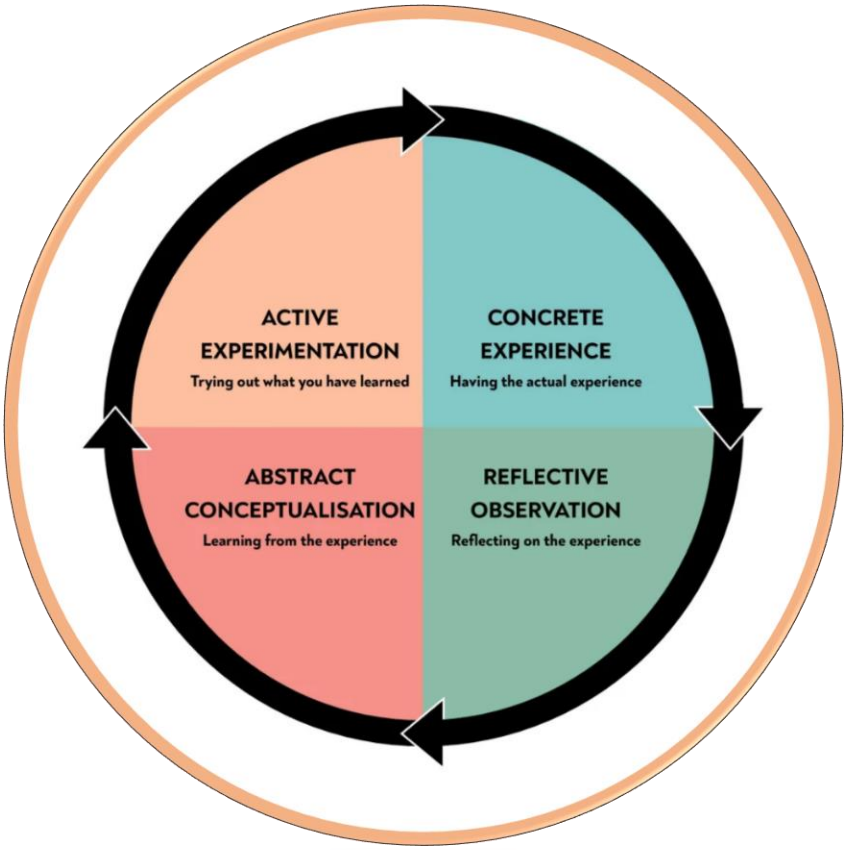


Figure 10: Kolb's Learning Styles & Experiential Learning Cycle.

Considering intelligence into a course design and learning outcomes means that intelligence is characterized by the ability to solve problems and learn in certain ways. According to the literature review and **Howard Gardner's Theory of Multiple Intelligences**[29] there are several types of multiple intelligence:

- Linguistic Intelligence (word smart) - Some strategies include reading assignments, writing assignments, creative writing assignments, oral assignments and storytelling, discussion, role play, journal writing, audio files, recorded lectures, and narrated slide show presentations

- Logical-Mathematical Intelligence (number/reasoning smart) - Some strategies include problem solving, mathematical, projects using spread sheets or data bases and using manipulatives, brain teasers, strategy games, categorization activities, compare activities, explorations, and experiments
  TT

[29] *Gardner's Theory Of Multiple Intelligences*. (2024). https://www.simplypsychology.org/multiple-intelligences.html

- Spatial Intelligence (picture smart) - Some strategies include, maze solving, charts, collages, maps, word games, and drawing activities

- Bodily-Kinesthetic Intelligence (body smart) – virtual field trips, gaming, role play, video production, model building

- Musical Intelligence (music smart) - Some strategies include interactive books, video, audio recordings, and projects that incorporate music

- Interpersonal Intelligence (people smart) - Some strategies include presentations and video conferencing, interviews, chats with individual students as facilitators, and word games, group projects, peer teaching assignments

- Intrapersonal Intelligence (self-smart) - Some strategies include individual assignments, self-paced projects, reflection assignments, self-assessment activities. concept mapping, blogs, and internet research as effective strategies

- Naturalist intelligence (nature smart) - Some strategies include videos, using data bases, and using spreadsheets, field trips to accommodate naturalistic intelligence. Other strategies to facilitate learning for learners with a dominant naturalistic intelligence include the use of nature photos and outdoor class sessions or projects

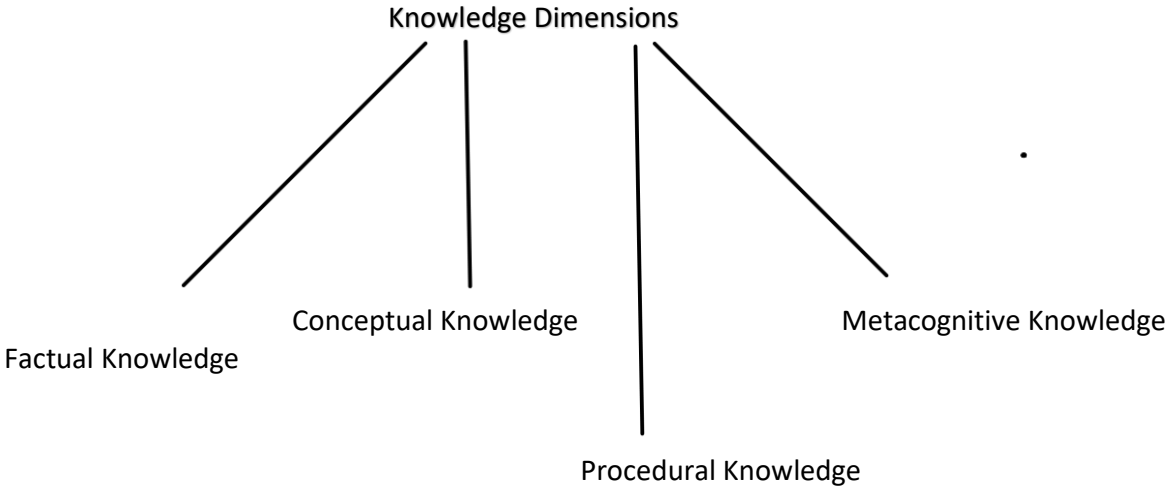
- Critical Evaluation

8.3 Learning Outcomes

Before writing the learning outcomes it is recommended to understand and distinguish between different learning domains and their levels[30]:

Cognitive Domain with knowledge acquisition, thinking, and intellectual outcomes. It consists of knowledge and conceptual process dimensions

[30] Harrell, L. (2013) A learner centered approach to online education IAP (Charlotte, NC & Eurospan, London)) http://www.infoagepub.com/products/A-Learner-Centered-Approach-To-Online-Education. *British Journal of Educational Technology*, *44*. https://doi.org/10.1111/bjet.12109_2



Conceptual Process Dimensions are Remember, Understand, Apply, Analyse, Evaluate, and Create.

Affective Domain allows the learner to put the content into the context of their own lives and careers and promotes student satisfaction. It reflects student attitudes, feelings and values particularly seen in the job environment such as employee management, teamwork, leadership, conflict management, motivation. It consists of five levels Receiving, Responding, Valuing, Organizing, and Characterization.

Psychomotor Domain reflects motor skills and doing through seven progressive levels: Perception, Set, Guided Responses, Mechanism, Complex Overt Response, Adaptation, and Origination.

Bloom's Taxonomy serves teachers in developing learning objectives, choosing teaching strategies, preparing assessments, developing grading rubrics, and developing critical thinking skills for learners.

Learning outcomes focus on whole course outputs and consist of the instructional objectives. Instructional objectives reflect what the learner should be able to do because of the instruction.

Writing good instructional objectives takes practice and improves over time. A common formula for writing instructional objectives is the ABCD formula:

A. Audience – Student, Adult/Lifelong Learner
B. Behaviour – It reflects what the learner should be able to do corresponding the instruction and includes a verb describing the process and a noun describing the knowledge, area of content, or type of skill
C. Condition – It shows how or when of the objective can be achieved
D. Degree – It shows the level or score of performance, competences and corresponding assignments

Table 13: Verbs to describe what the learner should be able to do in Behaviour

Cognitive Process Category	**Recommended Verbs**
Remember (includes Recognizing and Recalling)	Cite, count, circle, define, draw, describe, explain, identify, label, list, match, name, outline, recall, recognize, record, relate, repeat, reproduce, retrieve, select, state, tell, underline, write
Understand (includes Interpreting, Exemplifying, Classifying, Summarizing, Inferring, Comparing, and Explaining)	categorize, choose, cite examples of, classify, clarify, compare, conclude, contrast, convert, defend, distinguish, demonstrate use of, describe, determine, differentiate between, discriminate, discuss, estimate, exemplify, explain, express, extend, extrapolate. generalize, give in own words, identify, illustrate, infer, interpret, locate, map, match, paraphrase, pick, practice, predict, recognize, select, represent, report, respond, restate, review, rewrite, simulate, summarize, tell, translate
Apply (includes Executing and Implementing)	apply, carry out, change, compute, construct, discover, dramatize, employ, generalize, illustrate, initialize, initiate, interpret, manipulate, modify, operate, operationalize, practice, predict, prepare, produce relate, schedule, shop, show, solve, use
Analyse (includes Differentiating, Organizing, and Attributing)	analyse, appraise, break down; calculate, categorize, compare, conclude, contrast, correlate, criticize, deconstruct, deduce, debate, detect, determine, develop, diagram, differentiate, discriminate, distinguish, draw conclusions, estimate, evaluate, examine, experiment, identify, illustrate, infer, inspect, integrate, inventory, outline, predict, points out, question, relate, selects, separate, solve, test, diagnose
Evaluate (includes Checking and Critiquing)	appraise, assess, choose, compare, conclude, contrast, critique, describe, detect, discriminate, estimate, explain, evaluate, judge, justify, interpret, measure, rate, recommend, relate, revise, score, select, summarize, support, validate, value, test
Create (includes Generating, Planning, and Producing)	arrange, assemble, categorize, collect, combine, compiles, compose, construct, create, design, develop, devise, explain, formulate, generate, hypothesize, invent, manage, modify, organize, plan, prepare, produce, propose, predict, rearrange, reconstruct, relate. revise, set-up, synthesize, systematize, write
Affective Domain Category	**Recommended Verbs**
Receiving	accept, attend, ask, choose, describe, develop, follow, give, hold, identify, locate, name, point to, realize, receive, recognize, reply, selects, sits erect, uses
Responding	behave, aide, answer, assist, complete, comply, conform, cooperate, discuss, examine, greet, help, label, perform, practice, present, obey, observe, reads, recites, reports, respond, selects, tells, writes
Valuing	accept, balance, believe, complete, defend, describe, devote, differentiate, explain, follow, form, influence,

	initiate, invite, join, justify, prefer, propose, pursue, read, report, seek, select, share, study, value, work
Organizing	adhere, alter, arrange, combine, compare, complete, defend, discriminate, display, explain, favour, judge, generalize, identify, integrate, modify, order, organize, prepare, relate, synthesize, weigh
Characterization	act, demonstrate, discriminate, display, influence, listen, modify, perform, practice, propose, qualify, question, revise, serve, solve, use, value
Psychomotor Domain Category	**Recommended Verbs**
Perception	choose, describe, detect, differentiate, distinguish, hear, identify, isolate, relate, see, select, separate, smell, taste, touch
Set	Adjust, approach, assume, demonstrate, display, explain, locate, move, place, position, prepare, proceed, react, respond, show, start, volunteer
Guided Responses	assemble, attempt, build, calibrate, construct, copy, determine, discover, dismantle, display, dissect, duplicate, fasten, fix, grind, heat, imitate, inject, manipulate, measure, mend, mix, organize, repeat, try
Mechanism	adjust, assemble, build, calibrate, construct, dismantle, display, dissect, fasten, fix, grind, heat, illustrate, indicate, manipulate, measure, mend, mix, organize, set up, sketch, works
Complex Overt Responses	assemble, build, calibrate, construct, dismantle, display, dissect, fasten, fix, grind, heat, illustrate, indicate, manipulate, measure, mend, mix, organize, set up, sketch, works
Adaptation	adapt, alter, build, change, develop, modify, rearrange, recognize, supply
Origination	Arrange, combine, compose, construct, create, design, compose, originate

Writing learning outcomes and instructional objectives should be based on the Domains of Learning that promote higher levels of learning, not just remembering and understanding. The next step follows the choice of learning, teaching, and assessment strategies that align with the instructional objectives.

8.4 Guidelines on instructional teaching methods and evaluation and assessment strategy

The choice of delivery format of the specific course and its learning content can be synchronous and asynchronous and is linked to the type of instructional methods. Furthermore, it is recommended to include factors related to learners' characteristics, technological and organizational constraints (e.g. budget), and the time available. In the E-Learning environment the teacher can use a combination of instructional methods: Expositive, Application and Collaborative methods.[31]

Table 14: Instructional Methods

Expositive Methods emphasize the 'absorption' of new information. Expositive methods include presentations, case studies, worked examples and demonstrations.
Application Methods emphasize the active processes that learners use to perform procedural and principle-based tasks and build new knowledge. Application methods include the demonstration-practice method, job aids, case-based or scenario-based exercises, role play, simulations and serious games, guided research and project work.
Collaborative Methods emphasize the social dimension of learning and engage learners in sharing knowledge and performing tasks in a collaborative way. They include online guided discussions, collaborative work and peer tutoring.

Each method can be delivered in different formats, using different types of media and communication tools.

Application Methods

Job Aids

Job aids provide just-in-time knowledge such as immediate answers to specific questions, helping users to accomplish job tasks.

It can be realized through the asynchronous and synchronous delivery formats.

Asynchronous:

- Checklists, technical glossaries and manuals available as documents or as online tools

Synchronous:

- Live chat assistant

[31] *E-learning methodologies and good practices*. (n.d.). FAO Elearning Academy. Retrieved 5 August 2024, from https://elearning.fao.org/course/view.php?id=819

Scenario-based exercises, experiential simulations and learning games

Scenario-based exercises, experiential simulations and learning games are used to develop cognitive skills in a specific domain. Learners are asked to apply knowledge and principles to a concrete situation. Following the asynchronous and synchronous delivery formats it can reflect different aspects and approaches:

Asynchronous:

- Interactive e-learning lessons where feedback is provided to learners through comments on the appropriateness of their choices, after which they proceed to the next situation.
- Experiential simulations based on branched scenarios. The feedback to each learner's choice is provided through a follow-up situation that produces some more choices.
- Serious learning games, i.e. experiential simulations involving a competitive component, a challenging goal and a set of rules and constraints. They can also make use of virtual reality.
- Tutored activities with challenges to solve, either individually or in groups using forums and wikis. The tutor can provide feedback during and at the end of the work.

Synchronous:

- Activities with challenges to solve, either individually or in group, using whiteboards, polls, breakout rooms for group work. The instructor can provide feedback during and at the end of the work.

Role play

Role play is used to develop interpersonal skills. Learners react to the concrete situation via communication principles. For example, learners may be divided into groups of two people – one is designated as the policymaker and the other as the food security expert. The expert must convince the policymaker to act based on the expert's recommendations. After the simulation, the tutor/instructor comments on the learners' performance.

Guided research

The teacher or mentor tasks learners with conducting research on a specific subject and guides the learner in collecting and organizing information (guided research).
Asynchronous

- Discussion forums, e-mails for communicating between learner and instructor or tutor.
- Wikis, blogs and shared documents for presenting results.

Synchronous

- Audio or video conferences for communicating between learner and instructor or tutor, and for presenting results.

Collaborative Methods

Collaborative Methods focus on discussion and dialogue between the teacher (facilitator) and learners and reflect interpersonal skills development. The most common collaborative methods are online guided discussions, collaborative work and peer tutoring. They can be delivered in formats:

- Asynchronous: Discussion forums, e-mails, wikis, blogs
- Synchronous: Whiteboards, chats, audio/video conferences, breakout rooms for group work

Peer Learning

Peer learning enables acquiring of knowledge and skills through active helping and supporting and sharing knowledge and experiences among team companions, students in the group.

Peer Learning combine peer assessment and peer feedback in collaborative teamwork (CTW) contexts embracing formal assessment methods to reach social, professional and educational goals. In this context peer assessment refers to grading of peers while peer feedback entails giving, receiving and using qualitative comments by peers to support learning.

8.5 Toolkits for teaching

E-learning content can take the form of a toolkit when there are short pieces of content that belong to the same category, but are quite independent from each other, allowing learners to choose the topics that interest them the most.

- Media elements: videos, pictures, graphics, animations, tests. Animations and simulations are recommended for the demonstration-practice methods
- Storytelling – It provides information through a story narrative that places content in a realistic context and illustrates the actions and decisions of one or more characters. It can use illustrations, pictures or video sequences. It is useful for to provide a job-oriented knowledge
- Pedagogical Agents - Pedagogical agents can take the form of coaches or tutors to guide learners through the course.
- Gamification
- Case-based scenarios
- Microlearning

Figure 11: Storytelling

Evaluation and Assessment strategy

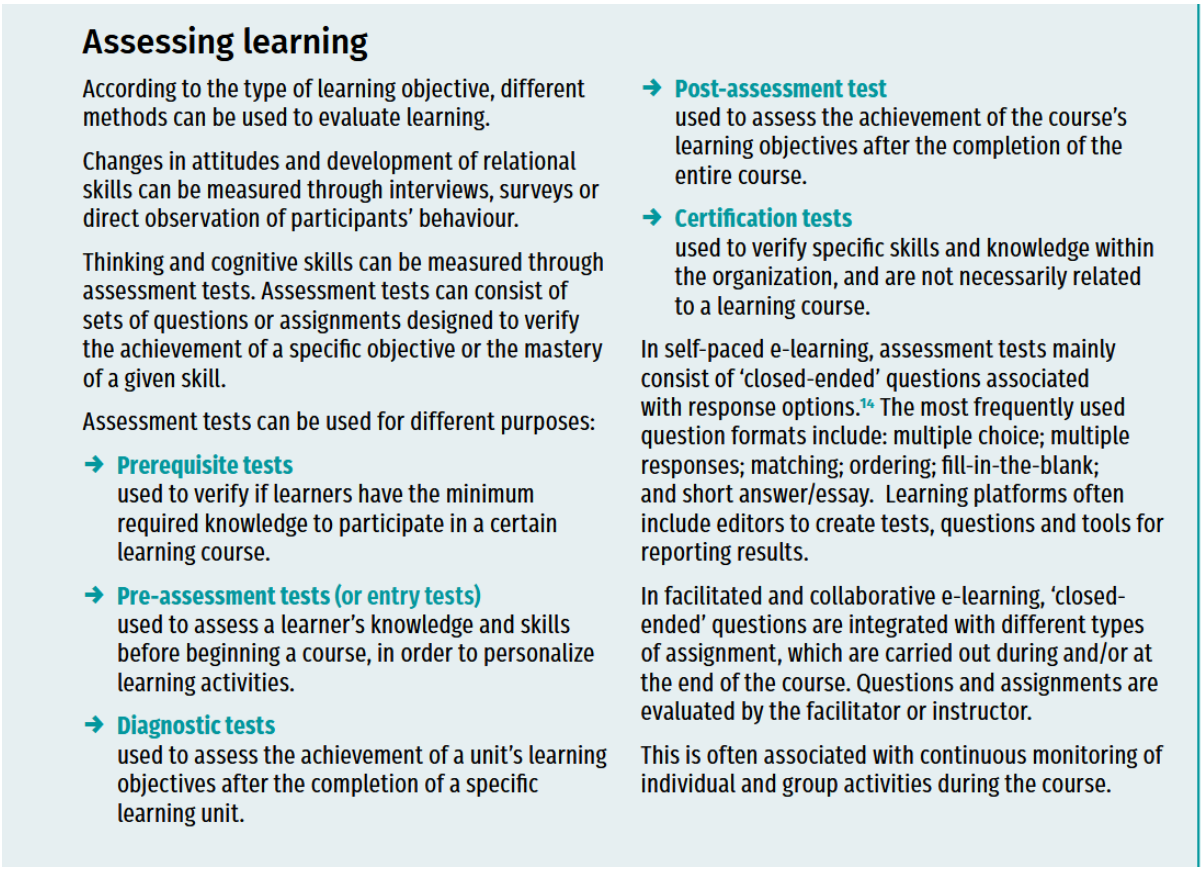
The evaluation and assessment have the purpose to monitor student learning, improve academic programs, and enhance teaching and learning. Regarding these aspects the evaluation can be provided during:

- The development stage, to improve instructional courses or products (formative evaluation)
- Or immediately after the implementation stage, to measure the effectiveness of education, training and learning (summative evaluation)
- And/or, some time after the course has been implemented, to understand if it is still valid or needs to be updated or modified (confirmative evaluation).

According to the Kirkpatrick model[32], the evaluation process can be implemented for

- Learners' reactions – Feedback through questionnaires and surveys
- Learning - Learning can be assessed through direct observation, assignments and tests.
- Behaviour - Evaluating behaviour means understanding the extent to which participants' behaviour has changed because of the training programme. The use of acquired skills and competences at work.
- Results – The results may include increased production, improved quality, reduced costs, and fewer accidents.

Assessment of learning means measurment of acquired skills and knowledge and obtained learning outcomes. Some teaching methods and strategies such as portfolios, journals, presenationts, case studies, demonstrations, peer teaching, and discussion questions can be used as the assessment methods.



Assessing learning

According to the type of learning objective, different methods can be used to evaluate learning.

Changes in attitudes and development of relational skills can be measured through interviews, surveys or direct observation of participants' behaviour.

Thinking and cognitive skills can be measured through assessment tests. Assessment tests can consist of sets of questions or assignments designed to verify the achievement of a specific objective or the mastery of a given skill.

Assessment tests can be used for different purposes:

- **Prerequisite tests**
  used to verify if learners have the minimum required knowledge to participate in a certain learning course.
- **Pre-assessment tests (or entry tests)**
  used to assess a learner's knowledge and skills before beginning a course, in order to personalize learning activities.
- **Diagnostic tests**
  used to assess the achievement of a unit's learning objectives after the completion of a specific learning unit.
- **Post-assessment test**
  used to assess the achievement of the course's learning objectives after the completion of the entire course.
- **Certification tests**
  used to verify specific skills and knowledge within the organization, and are not necessarily related to a learning course.

In self-paced e-learning, assessment tests mainly consist of 'closed-ended' questions associated with response options.[14] The most frequently used question formats include: multiple choice; multiple responses; matching; ordering; fill-in-the-blank; and short answer/essay. Learning platforms often include editors to create tests, questions and tools for reporting results.

In facilitated and collaborative e-learning, 'closed-ended' questions are integrated with different types of assignment, which are carried out during and/or at the end of the course. Questions and assignments are evaluated by the facilitator or instructor.

This is often associated with continuous monitoring of individual and group activities during the course.

Figure 12: Type of Learning Assessments.

The self-Assessment approach is important for the learning content development and for the lifelong learning approach and validation process of informal and non-formal learning.

[32] Nik Nazli, N. N. N., Hizam, S. M., Abu Hasan, N. N., & Abdullah, A. S. (2022). *THEORY OF TRAINING EFFECTIVENESS EVALUATION BY KIRKPATRICK Background of theory*. https://www.researchgate.net/publication/359578804_THEORY_OF_TRAINING_EFFECTIVENESS_EVALUATION_BY_KIRKPATRICK_Background_of_theory

Self assessment promotes active learning and reflects learner's strengths and weaknesses.

Peer assessment is when a student assesses the work of another student or a group and provides feedback.

Blended (Hybrid) Learning – Flipped Classroom

Blended learning or hybrid learning is an educational approach that combines learning with a teacher (face-to-face) and online learning. Blended learning involves elements of students' independent control of educational route, time, place and pace of learning, as well as the integration of learning experience with the teacher and online.

There are six main models of blended learning that vary by teacher roles, physical space, delivery methods and scheduling:

1. Face to face (where the teacher drives the instruction and augments with digital tools);
2. Rotation (students cycle through a schedule of independent online study and face-to-face classroom time);
3. Flex (most of the curriculum is delivered via a digital platform and teachers are available for face-to-face consultation and support);
4. Labs (the entire curriculum is delivered via a digital platform but in a consistent physical location; students usually take traditional classes in this model as well);
5. Self-blend (students choose to augment their traditional learning with online course work);
6. Online driver (all curriculum and teaching is delivered via a digital platform and face-to-face meetings are scheduled or made available if necessary)

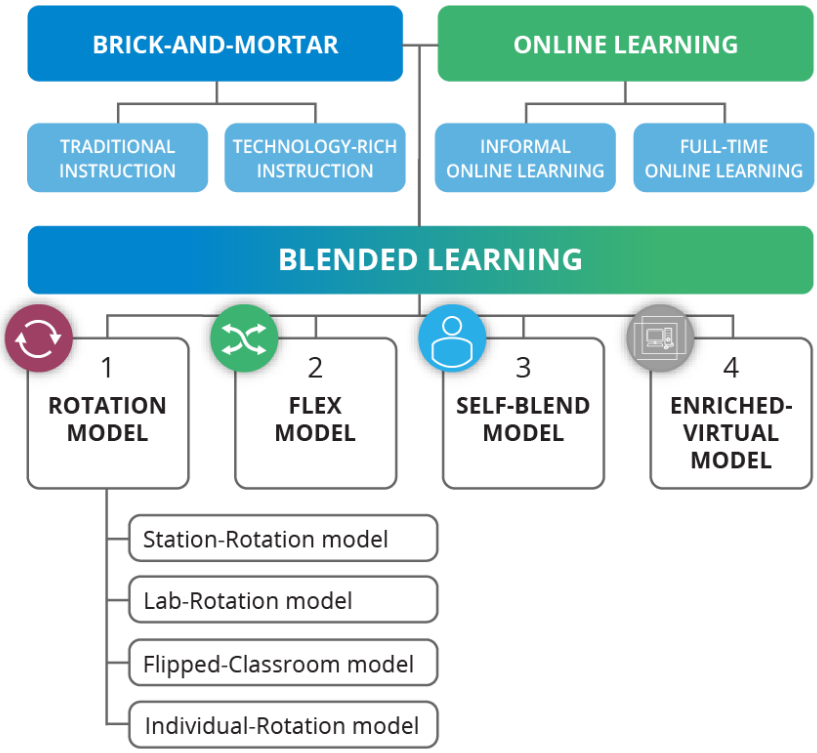
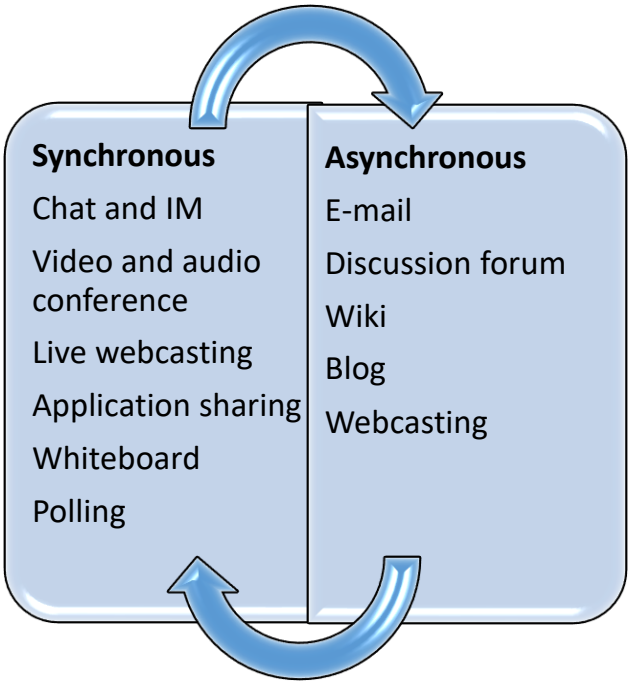


Figure 13: Blended Learning

For a deep and meaningful learning process and to develop self-directed learners, teachers may use different pedagogic approaches such as:

1. Direct instructions – explicit teaching of new content of knowledge by introduction of new concepts and demonstration of new skills
2. Enquiry learning – learners perform a range of tasks (e.g. asks, formulating, processing, discussing, designing, evaluating and concluding-critical thinking)
3. Co-construction – learners work with other learners and teachers and contribute to building the knowledge

In this collaborative learning process among learners, between learners and teachers, and among teachers, digital technologies play an important role. A flipped classroom is a type of blended learning approach, a flexible concept where face-to-face interaction is mixed with independent study – usually via technology. E-learning activities can be illustrated as synchronous or asynchronous activities:



Instructional Methods

Expositive methods	Application methods	Collaborative methods
Presentations **Case studies** **Worked examples** **Demonstrations**	Demonstrations-practise methods Jobs aids Case-based exercises Role plays Simulations and serious games Guided research Project work	Online guided discussion Collaborative work Peer tutoring

Student and Faculty support

In the SCL environment, the relationship between teachers and students plays crucial role. To ensure that effective relationship in online program and its implementation, it is important to provide resources and support for students and teachers. This can be teacher orientations and tutorials and reflected through academic support, access to resources, technical support (help desk), mentoring for new online students and educators, and the course management system.

Academic support includes program information where the students are informed through policies and procedures how to log in to the program, timetable and technical support,

administrative requirements. It also includes advisors and counsellors to support students with low academic performance or other issues. It is also important to provide tutoring and skills assistance for mastering course content.

In academic support, online coordinators assist advisors and tutors and provide students and teachers resources on how to use management systems and how to successfully complete online courses.

Access to resources includes access to libraries, software and hardware, computer and internet.

Each technical issue is supported through technical desk service.

Through mentoring an experienced student can offer support to new students by giving tips for strategies on how to effectively achieve the learning outcomes and how best to manage the time. It is the same approach for the online teacher mentoring.

There are several types of management system:

- Commercial course – requires licence for use of software, Blackboard
- Open source – MOODLE
- Home Grown Course

10.1 Offering information on Micro Credentials and guidance for Lifelong Learning

Micro credentials are particularly attractive to diverse stakeholders, and it is recommended that designers and issuers ensure transparency in the elements of information enabling potential learners to choose relevant micro credentials.

The relevant information on micro credentials should consist of:

- Title of the micro-credential
- Country(ies)/Region(s) of the issuer
- Learning outcomes including skill and competency-related information (with reference to the respective sectoral or other competency framework) if applicable
- Notional workload needed to achieve the learning outcomes (in credits where possible)
- Qualification Level (and cycle, if applicable) of the learning experience leading to the micro credential (with reference to the respective Qualification Framework), if applicable
- Type of assessment
- Form of participation in the learning activity
- Type of quality assurance used to underpin the micro credential
- Prerequisites needed to enrol in the learning activity
- Integration/stackability options (stand-alone, independent micro-credential/integrated, stackable towards another credential)

- Further information e.g. entitlements to which occupations as well as further education and training programmes the micro-credential may be recognised for

EUROPASS[33] represents a set of online tools and information that supports learners to present their skills, qualifications and experiences in 30 languages across Europe.

One of the most important aspects that micro credentials offer in order to attract potential learners is to provide and to ensure accessible, user-friendly and effective career guidance services.

Guidance services can take two forms:

1. In the promotion of the micro-credential – guidance on the learning and/or employment opportunities. This might also include services such as professional guidance counsellors, particularly for potential learners to have their prior learning recognised for flexible learning pathways
2. As part of the micro credential itself – inclusion of career guiding elements into micro-credentials which also focus on industry-specific skills

[33] info@europass-info.at, E. Ö., Nationalagentur Lebenslanges Lernen/OeAD (Österreichische Austauschdienst)-Gesellschaft mit beschränkter Haftung. (n.d.). *What is Europass?* Europass. Retrieved 5 August 2024, from https://www.europass.at/en/what-is-europass/

Sources

Figures

Figure 1: *Student-centered approaches for 21st century competencies.* (n.d.). ResearchGate. Retrieved 5 August 2024, from https://www.researchgate.net/figure/Student-centered-approaches-for-21st-century-competencies_fig1_356824288

Figure 2: *Student-centred learning—Toolkit for students, staff and higher education institutions,* Brussels, 2010.

Figure 3: *Student Centred Learning: Toolkit for Students, Staff and Higher Education Institutions. (2010). European Students' Union. Retrieved 5 August 2024, from https://esu-online.org/publications/student-centred-learning-toolkit-students-staff-higher-education-institutions/*

Figure 5: Cedefop. (2022). *Defining, writing and applying learning outcomes : a European handbook : second edition*. Publications Office of the European Union. https://data.europa.eu/doi/10.2801/703079.

Figure 6: Cedefop. (2022). *Defining, writing and applying learning outcomes : a European handbook : second edition*. Publications Office of the European Union. https://data.europa.eu/doi/10.2801/703079.

Figure 7: Vladana Vidric.

Figure 8: *Kolb's Learning Styles & Experiential Learning Cycle*. (2024). https://www.simplypsychology.org/learning-kolb.html

Figure 9: *FAO. (2021). E-learning methodologies and good practices: A guide for designing and delivering e-learning solutions from the FAO elearning Academy, second edition. Rome. https://doi.org/10.4060/i2516e*

Figure 10: *FAO. (2021). E-learning methodologies and good practices: A guide for designing and delivering e-learning solutions from the FAO elearning Academy, second edition. Rome. https://doi.org/10.4060/i2516e*

Figure 11: *Inverted classroom pedagogy? (n.d.). ResearchGate. Retrieved 5 August 2024, from https://www.researchgate.net/post/Inverted_classroom_pedagogy2*

Tables

Table 1: *Summary of Ten aspects of SCL, with percentage coverage of literature...* (n.d.). ResearchGate. Retrieved 5 August 2024, from https://www.researchgate.net/figure/Summary-of-Ten-aspects-of-SCL-with-percentage-coverage-of-literature-and-English_tbl1_376397492

Table 2: Fedeli, M., Tino, C. (2020). *Guidelines on teaching practices, A guide for instructors and practitioners to innovate practices in higher education and adult learning, Pensa MultiMedia Editore s.r.l. 73100 Lecce https://www.uni-wuerzburg.de/fileadmin/0603intall/IO2_Learning_community/Online_Teaching_Guideline/E-BOOK-published_guideline.pdf*

Table 3: Fedeli, M., Tino, C. (2020). *Guidelines on teaching practices, A guide for instructors and practitioners to innovate practices in higher education and adult learning, Pensa MultiMedia Editore s.r.l. 73100 Lecce* *https://www.uni-wuerzburg.de/fileadmin/0603intall/IO2_Learning_community/Online_Teaching_Guideline/E-BOOK-published_guideline.pdf*

Publications Office of the European Union

https://op.europa.eu/en/publication-detail/-/publication/ee9b069f-fba7-11ec-b94a-01aa75ed71a1/language-en%20.

Table 4: Cedefop. (2022). *Defining, writing and applying learning outcomes : a European handbook : second edition*. Publications Office of the European Union. https://data.europa.eu/doi/10.2801/703079.

Table 5: Cedefop. (2022). *Defining, writing and applying learning outcomes : a European handbook : second edition*. Publications Office of the European Union. https://data.europa.eu/doi/10.2801/703079.

Table 6: Cedefop. (2022). *Defining, writing and applying learning outcomes : a European handbook : second edition*. Publications Office of the European Union. https://data.europa.eu/doi/10.2801/703079.

Table 7: Cedefop. (2022). Cedefop. (2022). *Defining, writing and applying learning outcomes : a European handbook : second edition*. Publications Office of the European Union. https://data.europa.eu/doi/10.2801/703079.

Table 8: Cedefop. (2022). Cedefop. (2022). *Defining, writing and applying learning outcomes : a European handbook : second edition*. Publications Office of the European Union. https://data.europa.eu/doi/10.2801/703079.

Table 9: *Description of the eight EQF levels | Europass*. (n.d.). Retrieved 5 August 2024, from https://europass.europa.eu/en/description-eight-eqf-levels

Table 10: Cedefop. (2022). *Defining, writing and applying learning outcomes : a European handbook : second edition*. Publications Office of the European Union. https://data.europa.eu/doi/10.2801/703079.

Table 11: Student Centred Learning: Toolkit for Students, Staff and Higher Education Institutions. (n.d.). *European Students' Union*. Retrieved 5 August 2024, from https://esu-online.org/publications/student-centred-learning-toolkit-students-staff-higher-education-institutions/

Table 12: FAO. (2021). *E-learning methodologies and good practices: A guide for designing and delivering e-learning solutions from the FAO elearning Academy, second edition. Rome. https://doi.org/10.4060/i2516e*

Table 13: Harrell, L. (2013). *A Learner Centered Approach To Online Education. IAP.*

Table 14: Harrell, L. (2013). *A Learner Centered Approach To Online Education. IAP.*

References

Annual work programme 2011—Lifelong learning programme—European Commission. (2011). Retrieved 5 August 2024, from https://commission.europa.eu/publications/annual-work-programme-2011-lifelong-learning-programme_en

Attard A. et al. (2010) Student Centred Learning an Insight Into Theory And Practice, Printing: Partos Timisoara, Bucharest. https://esu-online.org/wp-content/uploads/2016/07/2010-T4SCL-Stakeholders-Forum-Leuven-An-Insight-Into-Theory-And-Practice.pdf

Description of the eight EQF levels | Europass. (n.d.). Retrieved 5 August 2024, from https://europass.europa.eu/en/description-eight-eqf-levels

ETF (2023). Guide to design, issue and recognise micro-credentials. KIC. https://www.etf.europa.eu/sites/default/files/2023-06/Micro-Credential%20Guidelines%20Final%20Delivery.pdf

FAO. (2021). *E-learning methodologies and good practices: A guide for designing and delivering e-learning solutions from the FAO elearning Academy, second edition. Rome. https://doi.org/10.4060/i2516e*

Fedeli, M., & Tino, C. (2020). *Guidelines on teaching practices. A didactical guide for instructors and practitioners to innovate practices in higher education and adult learning.* https://www.research.unipd.it/handle/11577/3395368

info@europass-info.at, E. Ö., Nationalagentur Lebenslanges Lernen/OeAD (Österreichische Austauschdienst)-Gesellschaft mit beschränkter Haftung. (n.d.). *What is Europass?* Europass. Retrieved 5 August 2024, from https://www.europass.at/en/what-is-europass/

Hariduse, noorte, spordi ja kultuuri peadirektoraat (Euroopa Komisjon). (2010). *ECTS and Diploma Supplement Label Holders 2009 & 2010: Make mobility a reality : excellence in Europe's universities*. Euroopa Liidu Väljaannete Talitus. https://data.europa.eu/doi/10.2766/67570

Harrell, L. (2013). *A Learner Centered Approach To Online Education*. IAP.

Hoidn, S., & Reusser, K. (2020). *Foundations of student-centered learning and teaching*. https://www.researchgate.net/publication/338921121_Foundations_of_student-centered_learning_and_teaching?enrichId=rgreq-745bb33d708ea0865f5e4bbff8c1e933-XXX&enrichSource=Y292ZXJQYWdlOzMzODkyMTEyMTtBUzoxMTQzMTI4MTA4MDAwMzc2MUAxNjYxMDAwNjk5MDE5&el=1_x_3&_esc=publicationCoverPdfm

Kolb's Learning Styles & Experiential Learning Cycle. (2024). https://www.simplypsychology.org/learning-kolb.html

Morris, T. H., Bremner, N., & Sakata, N. (n.d.). Self-directed learning and student-centred learning: A conceptual comparison. *Pedagogy, Culture & Society*, *0*(0), 1–20. https://doi.org/10.1080/14681366.2023.2282439

Noroozi, O., De Wever, Bram (2023). *The Power of Peer Learning. Fostering Students' Learning Processes and Outcomes.* Springer, 6330 Cham. https://link.springer.com/content/pdf/10.1007/978-3-031-29411-2.pdf

Sridharan, B., McKay, J., & Boud, D. (2023). The Four Pillars of Peer Assessment for Collaborative Teamwork in Higher Education. In O. Noroozi & B. De Wever (Eds.), *The Power of Peer Learning: Fostering Students' Learning Processes and Outcomes* (pp. 3–24). Springer International Publishing. https://doi.org/10.1007/978-3-031-29411-2_1

Student Centred Learning: Toolkit for Students, Staff and Higher Education Institutions. (n.d.). *European Students' Union*. Retrieved 5 August 2024, from https://esu-online.org/publications/student-centred-learning-toolkit-students-staff-higher-education-institutions/