Models and guidelines for the design and development of joint micro-credential courses and microlearning units in higher education

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Content

Tags

joint micro-credential course; microlearning unit; joint MOOC; joint course design and development; Common Microcredential Framework; qualification framework for continuing education and professional development; Recommendation of the EU Council of Ministers on Micro-Credentials (EC proposal); modular education; continuing education policies

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- European MOOC Consortium for the Labour-Market (EMC-LM)
- Professional Development for Digital Teaching and Learning (DigiTel Pro)

Introduction

This eBook provides pedagogical guidelines for designing and developing joint micro-credential courses and microlearning units, to be published on the BLOOM hub.

The hub will present a series of models and guidelines for key educational digital formats for digital higher education courses and programmes, international collaboration and mobility. The development of micro-credentials in a lifelong learning perspective is a top priority of the European Commission, as expressed in the European Commission's Proposal for a Recommendation to the Council of Ministers on Micro-credentials. The Proposal defines the elements required when granting microcredential awards.

In the preparatory documents of the European Commission's Micro-Credentials in Higher Education Consultation Group, the offer of microcredentials can vary in learning volume from 1 ECTS to any volume smaller than a degree at the same EQF level.

In this eBook, we cover joint micro-credential courses of 1 to 3 ECTS and stand-alone microlearning units of less than 1 ECTS. Courses are awarded with ECTS credits, if they are organized in a formal higher education institution. Microlearning units belong to the non-formal learning sphere for which a badge can be issued. In turn, they can be integrated into a course.

Microcredential programmes are covered in another eBook (Henderikx, Ubachs & Antonaci, 2022). They consist of more than one course such as joint Common Microcredential Framework (CMF) programmes of 4 to 6 ECTS , fulfilling these requirements, and larger programmes with currently a large variety of learning volumes and names such as undergraduate/postgraduate certification programmes, continuing education programmes, expert programmes, specialization programmes, focus diplomas, MOOC tracks, micromasters or nanodegrees.

In order to facilitate recognition by academia and employers, it is appropriate that a coherent microcredential qualifications structure is built, based on learning volume and EQF level and in line with the Recommendation of the European Council to be adopted. Micro-credentials will be discussed in the near future at the level of the EU Council, national governments and higher education institutions.

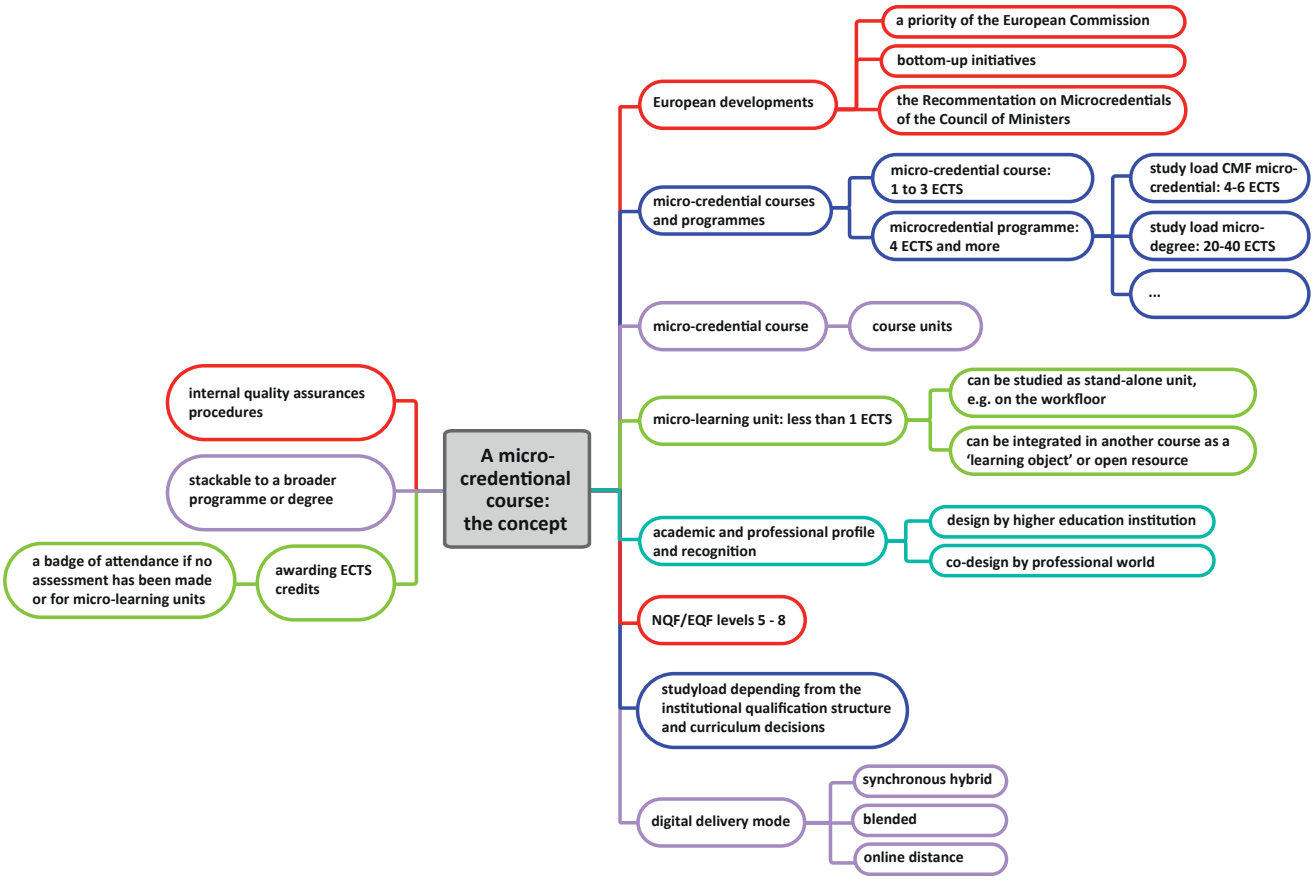
The basic premise for our guidelines is "teaching as a design science" (Laurillard, 2012): educational formats as presented on the BLOOM hub should be the subject of successive design steps, in which teachers and programme boards take the lead, supported by teaching and learning and educational ICT support services. Institutional leadership should promote innovation in higher education through digitalisation strategies and create the

necessary conditions for the design, development and implementation of digitized education.

This eBook is based on a long experience in designing and developing joint education programs at European universities at all levels and on expertise derived from recent European projects.

This eBook first provides a general overview of the successive design and development steps for a joint micro-credential course or microlearning unit. The sections that follow explain each of these steps, mapping out guidelines and actions to be taken for each step. From the general overview, the eBook can be unfolded and makes each section directly accessible.

A joint micro-credential course: the concept



This eBook is about the design of joint micro-credential *courses*. For reasons we will explain below, this differs from the design of micro-credential *programmes* for which we developed another eBook.

These guidelines are in line with the latest developments in EU policy developments in the field of micro-credentials and with recent practices. A European consensus is emerging on the concept of micro-credentials and further institutional and national frameworks will build on this foundation in the coming years.

European developments

Micro-credentials have become a priority for the European Commission and the Bologna Process:

- The ***Digital Education Action Plan*** **(DEAP)** refers to micro-credentials that "facilitate the provision of flexible, accessible learning opportunities, including for adult learners and professionals, and help them re-skill, up-skill or change careers", capturing "the learning outcomes of short-term learning" (European Commission, 2018). They are mentioned in the 2020 Bologna Process **Rome Ministerial Communiqué**, asking "the Bologna Follow Up Group (BFUG) to explore how and to what extent smaller, flexible units, including those leading to micro- credentials, can be defined, developed, implemented and recognised by our institutions using EHEA tools" (EHEA, 2020).

- The ***European Commission's Micro-credentials in Higher Education Consultation Group***, was composed of leading experts and organisations in the field. It discussed the DEAP strategies and several ongoing EU projects, and it was supported by comprehensive reports on the state-of-the-art of micro-credentials (Orr et al., 2020; Brown et al., 2021). The Group proposed a definition of a micro-credential award. Micro-credential qualifications proof "evidence of the learning outcomes that a student has acquired after a short learning experience. These learning outcomes are tested against transparent standards. The evidence is contained in a certified document stating the name of the holder, the learning outcomes achieved, the assessment method, the awarding body". As far as formal education is concerned, it is also referring to "the qualifications framework level and the credits obtained". Micro-credentials are student-owned, can be shared, are transferable, and can be combined into larger credentials or qualifications. They are supported by quality assurance according to agreed standards" (European Commission, 2021a).

- The ***Microbol project*** brought together the members of the Bologna Process to explore how micro-credentials fit into the framework of the European Higher Education Area (EHEA) and linked micro-credentials to the main commitments of the Bologna Process.

A micro-credential is "designed to provide the learner with specific knowledge/skills/competences that meet societal, personal, cultural or employability needs. Micro-credentials are subject to a quality assurance assessment in accordance with the ESG (Standards and Guidelines for Quality Assurance in the European Higher Education Area). They have an explicit reference to defined learning outcomes at a specific EQF-EHEA/NQF (European/National Qualifications Framework in the European Higher Education Area) level that will be achieved, the workload, expressed in ECTS, and to the assessment methods and criteria used.

Any micro-credential can be recognized by a higher education institution as, and through recognition of prior learning procedures (RPL). Micro-credentials are not only useful for professionals, but can also complement the curriculum for undergraduate, graduate and doctoral students (Cirland, E. & Loukkola, T., 2020).

Bottom-up initiatives

Bottom-up, several initiatives have been developed to implement micro-credential programmes in practice.

- The European MOOC Consortium (EMC), consisting of the main European MOOC platforms (Futurelearn, FUN MOOC, Miriadax, EduOpen, iMooX, OpenupEd) has developed standards for the ***Common Micro-credential Framework (CMF)*** for MOOC-based programmes (see in this eBook the section on qualifications). CMF micro-credentials consist of a coherent set of MOOCs, have a size of 4 to 6 ECTS and are linked to an EQF level of 5, 6, 7 or 8 levels. The Bologna tools are used. CMF is a European response to a wide

variety of qualifications, such as MicroMasters and nanodegrees, that do not use these tools (European MOOC Consortium, 2018).

- In 2017, EADTU members started developing ***short learning programmes (SLPs)***. They were a first step in organizing online continuing education and professional development services that address the time horizon of learners at work and the needs of the economy and society. Short learning programmes consist of a coherent set of courses in a field with a total learning volume of 5 to 30 ECTS at EQF levels 5,6,7 and 8. Short learning programmes can be divided into stackable CMF credentials that award intermediate qualifications. The Bologna instruments are used in a similar way. The name of the final qualification differs per institution (EADTU, 2021).

- Along these developments, the ***Micro-HE project*** (Micro-HE, 2020) gathered the state of the art of micro-credentials in European higher education institutions and was forecasting the impact of the modularisation of higher education on higher education institutions. It was also examining adequate recognition instruments for micro-credentials and proposing a meta-standard for the description of micro-credentials to facilitate the transfer and portability of micro-credentials. As a follow-up, the ***ECCOE project*** (ECCOE, 2022) developed descriptors for micro-credentials and created a Model Credit Recognition Agreement for cross-institutional recognition.

- The **Evaluate and STACQ projects** of several NARIC offices aim to support institutions in the credential evaluation of micro-credentials for recognition by universities and employers and of mobility (Nuffic, 2022). It produced both an online evaluation tool for micro-credentials and a paper on the future of the qualification.

- A ***CEDEFOP study*** (CEDEFOP, 2022) provided a better understanding of the role played by micro-credentials, as an education, training and learning element, in supporting labour-market related and employment-relevant training. It aims to offer new knowledge on the characteristics of micro-credentials as well as their impact on existing qualifications and recognition systems.

The EC proposal for a Recommendation to the Council of Ministers

In the ***EC proposal for a Recommendation to the Council of Ministers*** of Education (European Commission, 2021b), a *'micro-credential'* means "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".

In the proposal, *micro-credential records should contain a number of standard elements,* such as the learning outcomes targeted by the learning experience, the notional workload (in terms of ECTS), the level in the EQF or QF-EHEA frameworks, the form of participation in the learning activity, the type of quality assurance. Optional requirements to the micro-credential description are for example: the prerequisites to enroll, the stackability/ integration of the micro-credential.

The proposal calls on the Member States to "supporting the *exploration by higher education institutions of the role of micro-credentials* to offer learning opportunities to diverse learners, in particular by widening an attractive, inclusive and learner-centred offer of lifelong learning activities, including through the activities of the European Universities Alliances", a*nd to support the delivery and design of micro-credentials,* especially also in collaboration with other providers (companies, social partners, civil society organisations, local authorities and private providers).

This eBook offers models and guidelines for designing and developing micro-credential programmes, taking into account the standard elements in the Recommendation. When the Recommendation is adopted in 2022, national Member States will start or complete the development of their own frameworks and regulations.

The concept

Micro-credential courses and programmes

- In terms of *volume for a micro-credential,* the "Micro-credentials Consultation Group in Higher Education" allowed "flexibility for innovation and experimentation: "from one ECTS to less than a full degree". From a design point of view, however, volume matters. A distinction must be made between:

  – **a micro-credential course**, consisting of a single course (1-3 ECTS) using a method of course design.
  In this eBook, we discuss the design of joint micro-credential courses. It also includes the design of course and microlearning units of less than 1 ECTS within a course, for which labour market demand is growing. These units can have an innovative impact on mainstream courses as "learning objects".

  – a **micro-credential programme**, consisting of a coherent set of courses in a specific field, requiring a curriculum design methodology.
  The design of a micro-credential programme is described in another eBook (Henderikx, Ubachs & Antonaci, 2022).
  Micro-credential programmes consist of more than one course. They have a total learning volume of 4-6 ECTS (CMF micro-credential programmes) or more,

for example, a microdegree programme of 20-40 ECTS or an undergraduate or postgraduate certificate programme of 60 ECTS.

The volume of courses and programmes will depend on the institutional and national qualification structure for micro-credentials that will be developed in the coming years as a follow-up to the intended Recommendation of the Council of Ministers on Micro-credentials.

Micro-credential courses and course units

*In this eBook, the design of **micro-credential courses** is described.* The minimum size of a course is in most cases conditioned by frameworks in higher education institutions (usually more than 1 ECTS). Most teaching staff divide a (blended or online) course in **course units** which can also contain formats as discussion groups, seminars, exercises, field or lab observations, multimedia learning objects, podcasts, simulations and augmented reality, or even larger units such as a summer school or project work.

Micro-learning units

In some cases, courses are designed to be studied as a stand-alone unit, which can be integrated into another course or used as a unit in corporate training. In this eBook, these standalone units are referred to as microlearning units. The labor market demand for such small microlearning units is growing, especially for workplace learning. Since they are less than 1 ECTS, they are not considered micro-credentials in the European Commission's definition.

In other cases, microlearning units are developed completely from scratch, whether or not in co-creation with employers or professional associations. Many microlearning units for corporate training are very short, e.g. ranging from 5 to 30 minutes focused on one learning objective or skill. There are no hard and fast rules regarding the learning volume. The volume depends on the type of learner, the complexity of the knowledge or skills, the learning context or the learning strategy of the learning organization. Due to the need for flexibility and seamless connection with workplace activities, they are suitable for mobile learning.

Universities in this case provide content, based on research and innovation, and support the learning design of the programme. Academic content can be combined with content provided by an employer, sector or professional organization. It can be decided that a microlearning unit can be stacked into a microcredential course, possibly in combination with other units.

Therefore, this eBook includes not only the design of micro-credential courses, but also of microlearning units of less than 1 ECTS.

Main features of a micro-credential course

- Micro-credential courses have an *academic and professional profile* and seek academic and professional recognition. They are designed by a higher education institution and possibly co-designed by a labour market organization (e.g. a public or private enterprise; a professional organisation; an employment agency);

- A micro-credential course in higher education refers to a *5, 6, 7 or 8 level of the national or European qualifications frameworks*, awarding a qualification such as an ECTS credit or at least a badge of attendance.

- The *study load* of a micro-credential course is depending on institutional frameworks and curriculum decisions. This can also be the case for the volume of course units and micro-learning units.

- *Digital delivery methods* for micro-credential courses and microlearning units are mainly based on principles of synchronous hybrid, blended or online distance learning;

- Micro-credential courses are awarded with ECTS credits after assessment. For micro-learning units and for units for which no assessment has been made, a badge of attendance, participation or completion can be issued;

- Micro-credential courses can be designed to be *stackable* into a micro-credential programme, which in turn can be stackable into bachelor's or master's degrees;

- Micro-credentials are subject to the *institutional quality assurance* procedures of a higher education institution.

Recommendations

- To ensure professional recognition, micro-credential programmes can be designed together with professional organizations and employers (e.g. for needs assessment, case studies, projects, workplace learning, internships, demonstrations, etc.). In some cases, a labour market organization also provides some of the content for which a separate professional certificate can be issued;

- A modular structure for micro-credentials (for example course units) helps students to structure learning and stimulates study progress;

- Micro-credentials courses should be further integrated into a qualification structure for lifelong learning as part of the European Higher Education Area;

- Digital education is recommended to make a micro-credential course accessible and flexible for working learners. It makes continuing education and professional development scalable.

The design of a joint micro-credential course and microlearning units: overview of successive steps

Guidelines

Because of the involvement of different universities, designing and developing a joint micro-credential course is a complex activity, consisting of several steps:

- connect with institutional and cross-institutional policies and strategies, for example in the case of the European Universities Initiative (European Commission, 2021c), more specifically related to continuing education and professional development.

- share with the partner universities a joint vision on the course. Define the macro-objectives, based on a needs analysis and learner characteristics. Develop an academic and professional profile and determine specific course settings for meeting lifelong learners' living and working conditions. Develop a unique selling point, developing synergies with other universities for a higher quality and making the course internationally attractive for continuing education.

- compose the joint course team, led by a course team leader with scientific and educational authority. Share leadership with key teaching staff of the respective institutions and involve them in the design and development of the course;

- ensure (cross-)institutional professional support through teaching and learning, internationalisation, ICT for education, legal services and student administration. All are needed in the design and development phase of the joint course;

- design the joint course according to current pedagogical principles so that it can be successfully developed and implemented: define learning outcomes and competences, develop a course plan and distribute the design and development tasks across the partnership, design and sequence learning activities, design modular course units, improve the student's learning experience, define modes of delivery, design course interactions, select and align media and tools, design space for flexibility; determine the study load; and make the course inclusive;

- if appropriate, design micro-learning units, based on course units or developed from scratch in co-creation with stakeholders, transferring knowledge for professional development in the workplace, taking into account the demand for competences/skills and the development of core attitudes (21st century skills);

- decide with the partners on the delivery platform for the joint course;

- agree on a coherent approach on formative and summative assessment and feedback. Determine joint examination regulations.

- justify and agree on a joint award to be granted, for example credit points or a badge aligned with institutional and national qualification structures for continuing education and professional development. It is expected that these structures will be further developed following the Proposal for a Recommendation of the European Commission to the Council of Ministers on Micro-credentials (2022-2025);

- install a language policy in line with the international ambitions for the course;

- Define an admission framework for the course and develop a student recruitment plan, including multi-segment recruitment campaigns;

- make agreements on a common scheme for quality assurance, linked to institutional frameworks and based on ESG and the Guidelines for e-learning (ENQA, 2015; Huertas et al., 2018);

- develop a joint business plan, balancing public and private funding and tuition fees within broader institutional frameworks for continuing education;

- develop a sustainability framework with a multi-year commitment from universities to ensure basic sustainability, a regular institutional review and improvement plan and a medium-term financial plan;

- conclude a consortium agreement in which responsibilities and tasks are laid down.

Observations

- Universities in the EUI alliances cooperate in many areas for continuing education and professional development, providing a natural environment for joint micro-credential course and programme development;

- Efforts for (online) continuing education and professional development are being strengthened and streamlined in leading universities, for example by creating "extension schools" or centres for continuing education;

- There is growing demand for micro-credential courses and programmes which are stackable to larger microdegree and degree programmes. At the same time, there is demand for small and very small microlearning units (less than 1 ECTS), e.g. for workplace learning;

- This argues for modular education that is at all times adapted to the current time horizon of the learners. However, micro-credentials and standalone microlearning units require a specific approach to learners' needs, so their design may require an own approach to learners' needs. A course or programme module is therefore not necessarily equivalent to a standalone micro-credential or microlearning unit.

- The MOOC platforms in the European MOOC Consortium and the universities linked to them are developing MOOC pathways and have agreed on micro-credential standards according to the Common Micro-credential Framework (CMF). These micro-credentials of 4 to 6 ECTS are stackable into broader micro-credential and degree programmes;

- The European Commission and the Council of Education Ministers are preparing a micro-credential framework (Recommendation, 2021; implementation, 2025) to promote the development of lifelong learning and professional development;

- Expertise in the design and development of joint courses and programmes and related mobility is increasing at all levels, for example through the involvement of universities in Erasmus Mundus masters programmes. This supports the scientific basis for designing and developing joint micro-credentials.

Align with institutional and cross-institutional policies

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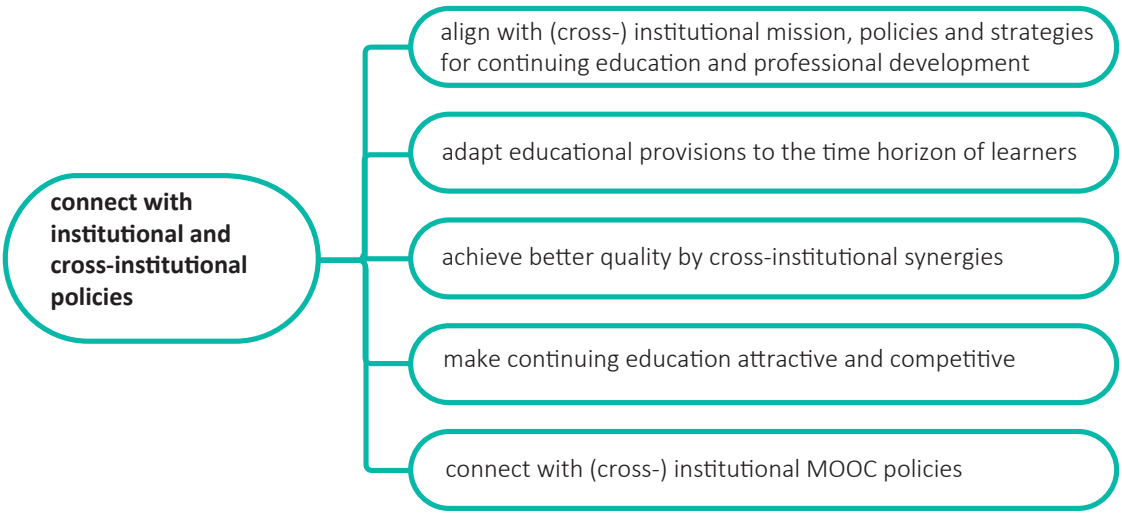

A micro-credential course should connect with institutional and cross-institutional policies:

- Align with the (cross-)institutional mission, policies and strategies for continuing education and professional development;
- Adapt educational provisions to the time horizon of learners;
- Achieve better quality by cross-institutional synergies;
- Make continuing education attractive and competitive
- Connect with (cross-)institutional MOOC policies

Align with the (cross-)institutional mission, policies and strategies for continuing education and professional development

European higher education is evolving into three areas of education: mainstream education, continuing education and open education (OER, MOOCs). In the perspective of the transformation agenda for higher education, universities are becoming more interwoven with the knowledge-intensive sectors of society, responding to the needs of the economy and society as a whole.

Some leading universities have already developed comprehensive policies for continuing education and professional development in line with their mission. They have built a framework for continuing education and professional development, for example an extension school or continuing education centre. They have developed an institutional qualification structure for awarding certificates for micro-credential courses and programmes. These are closely linked to research and innovation and mainstream education in their institution.

Nevertheless, it remains a challenge for all universities to create facilities for adult learners.

To make continuing education and professional development more relevant and engaging, universities seek collaboration with stakeholders such as employers, professional organizations or business sectors.This will lead to the co-creation of courses and microlearning units in a variety of ways such as needs analysis, the definition of knowledge and skills to be achieved; the co-creation of content; the design of learning activities; internships; or the endorsement of micro-credential qualifications.

Adapt educational provisions for continuing education and professional development to the time horizon of learners at work

Universities are aware that continuing education and professional development must adapt to the time horizon of learners through new forms of education such as micro-credential courses and programmes. These new provisions can be recognized as stackable modules for broader degree programmes.

This approach creates new opportunities for continuing education and professional development. It is now supported by the European Commission, which has proposed a Recommendation to the Council of Ministers to establish a framework for micro-credentials (European Commission, 2021b).

Thus, it becomes a new priority for national governments and higher education institutions. Frontrunner universities will help determine this development.

Achieve better quality through cross-institutional synergies

By organizing micro-credential courses and programmes, universities achieve better quality through institutional synergies. They make their best content available within the partnership to respond to real-world needs in society.

This collaboration builds on and promotes close interaction with research and innovation departments in the partnership. Through these synergies, they enhance both the research and professional orientation of micro-credentials.

Micro-credential courses and programmes are also an asset for pedagogical innovation that enables institutions to reach learners across Europe, create an international experience for them and apply new ways of delivery, using methods of blended, synchronous hybrid and online distance learning.

Make continuing education attractive and competitive at national, European and global level

Leading universities can offer micro-credential courses and programmes to make continuing education more attractive and competitive at national, European and global levels. Digital delivery methods enable them to scale up participation in micro-credentials and improve quality in content and pedagogy.

In this way they provide institutional, national, European and international added value.

Connect with (cross-)institutional MOOC policies

Universities can link policies for continuing education and the development of micro-credentials to their policies regarding MOOC offerings.

Many universities in Europe develop MOOCS, which are published either on a MOOC platform or on their own website. On European platforms alone, about 400 universities are active with 3500 MOOCs, followed by 25 million learners. This is open education on a large scale.

MOOC platforms provide services to universities for the design, development and delivery of MOOCs, while the academic responsibility and ownership remains in the hands of the university. MOOCs are free. A fee is due for assessment and awarding of credits by the university.

Some platforms develop MOOC pathways, consisting of a coherent set of MOOCs, in several cases in collaboration or co-design with the labour market.

European MOOC platforms are offering MOOCs in mainly one language:
Futurelearn (UK, English)
France Université Numérique – FUNMOOC (FR, French)
Miriadax (SP, Spanish)
OpenEdu (IT, Italian)
NAU (PT, Portuguese)
iMooX (AU, German)
AI Campus (GE, German)

The European MOOC Consortium created the Common Micro-credential Framework for digital courses with a total learning volume of 4-6 ECTS at levels 5, 6, 7 or 8 of the European Qualification Framework (European MOOC Consortium, 2018).

European universities can publish MOOCs on the OpenupEd portal for global exposure (OpenupEd, 2013).

MOOCs, MOOC pathways and micro-credentials that are suitable for the labor market can also be published on the MOOCs4you portal (EADTU, 2022b).

Share a joint vision on the micro-credential course

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As a first step, partners have to develop a joint educational vision for the micro-credential course, consisting of:

- Investigate needs;
- Develop an academic and professional profile;
- Take into account the characteristics of learners;
- Define the objectives and the unique selling point of the course;
- Define the relationship with existing courses and programmes;
- Indicate the stackability of the course.

Guidelines

Investigate needs

A needs assessment in the targeted academic and professional field is done on the basis of existing need studies or after consultation of stakeholders. Already at this stage, it is useful to rely on associated partners such as professional organisations, sectors and companies or public services.

During this needs assessment, it is important to hear the student's voice. What are their needs in terms of updating knowledge, up-skilling and re-skilling, career development or challenges after a career switch? How much time can they make available for learning? How much flexibility is needed? Which mode of delivery do they prefer?

Develop an academic and professional profile

The academic and professional profile of the micro-credential course is described, based on identified social, economic and cultural needs and challenges, (multidisciplinary) research and innovation in the relevant scientific domain and the possible link with degree education.

Stackability with degree programmes is examined, as well as the contribution of the course to employability and innovation on the labor market.

The relevance and outreach of the course will benefit from involving not only academic but also labour market partners and learners in the decision-making process.

Take into account the characteristics of learners

The partnership defines the main target groups for the micro-credential course and the expected learner characteristics, including the prior knowledge needed and the motivation to improve competences for employment in certain sectors or professions.

Define the course objectives and unique selling point

The general objectives of the course are defined in economic, social and cultural terms.

The objectives of the micro-credential course are further defined from an academic point of view and its possible contribution to the innovation and competitiveness of the higher education institutions involved.

A "unique selling point" is sought for a sufficient target group in the joint partnership and beyond.

Define the relationship with existing courses and programmes.

The relationship with other continuing education and professional development offerings in the partnership is clarified. Potential collaborations are being explored. The added value of the micro-credential course compared to existing courses or programmes in the same field is explained. It also indicates the extent to which this added value contributes to university excellence.

Indicate the stackability of the course

Indicate whether the course can be stacked in a broader micro-credential or degree programme and possibly in other institutions or EUI alliances, e.g. through Erasmus+ learning agreements

If a course is not directly stackable, it can still be recognized by a higher education institution through a procedure for the recognition of prior learning (see ECTS Users' Guide, European Commission, 2015).

Compose a joint micro-credential course team

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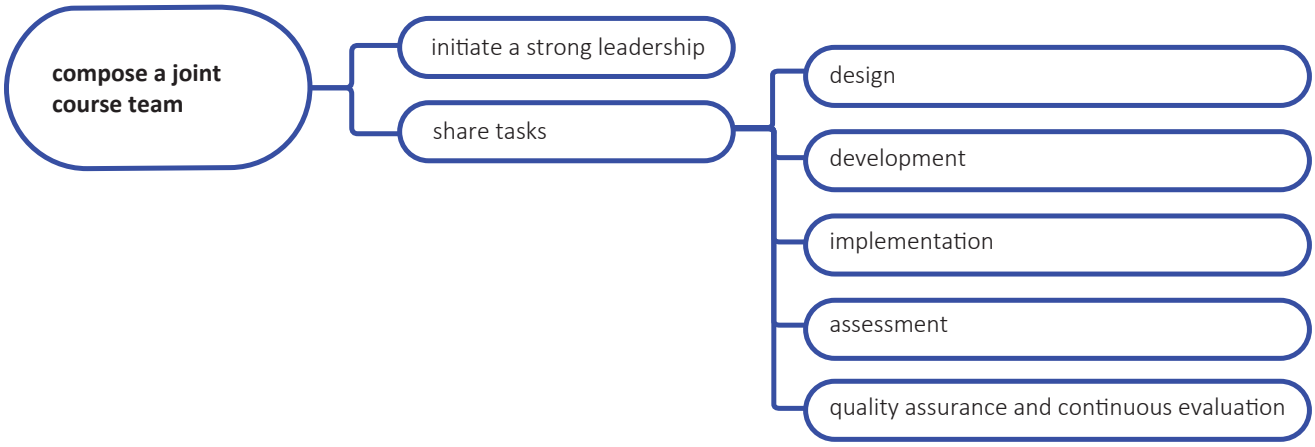

For developing a joint micro-credential, a course team has to be composed:

- Initiate a strong leadership;
- Share tasks.

Guidelines

Initiate a strong leadership

- The success of a joint micro-credential course is largely dependent on the course management and the quality of the course team. The course leader is a university staff member who assumes overall academic and managerial responsibility for the micro-credential course;
- This responsibility is shared with the other course team members who each represent and engage his or her partner university;
- In all cases the management is collegial/consensual in nature.

A joint course team should have a strong foundation, for example consisting of previous research relationships or at least common research interests, expertise in innovation, mobility schemes or internationalization projects, belonging to the same network or European Universities Initiative. When developing a joint course, course team members involve their faculties in delivering the course.

The course team should involve learners in continuing education, at least for a certain number of tasks, to provide the learner's perspective.

Team leader and partners should consider a time horizon of several years of course implementation to compensate for the effort involved in course design and development.

As a pen holder, the team leader must lead the design, development and implementation processes. He invites partners to bring in their best input at different stages. The team leader ensures that he has the educational, technological and organizational support from his faculty and university to lead these processes. Partners do the same on their part.

For the development of a micro-credential, collaboration with external stakeholders such as professional organizations and public or private partners may be appropriate, especially for the development of competences for the labour market.

The course team can engage such stakeholders as associated partners for aspects of course co-creation, for example the analysis of needs, the identification of competences, the development of learning outcomes or the co-developing of micro-learning units.

Share tasks

- The course team is responsible for all phases of establishing a joint micro-credential course design, development and implementation;
- The course team determines the examination rules, including the grading system and the conditions for awards such as badges and ECTS credits;
- The university of the course team leader is responsible for the (internal) quality assurance of the course, while each partner university provides all the data necessary to fulfill this task. Together they develop a procedure for the continuous evaluation of the course.

Each stage of development of a course requires a certain amount of time. Depending on the institutional support of the team leader and the partners, the design phase takes at least three months, followed by a development phase of at least six months after which the course can be implemented.

Ensure cross-institutional support

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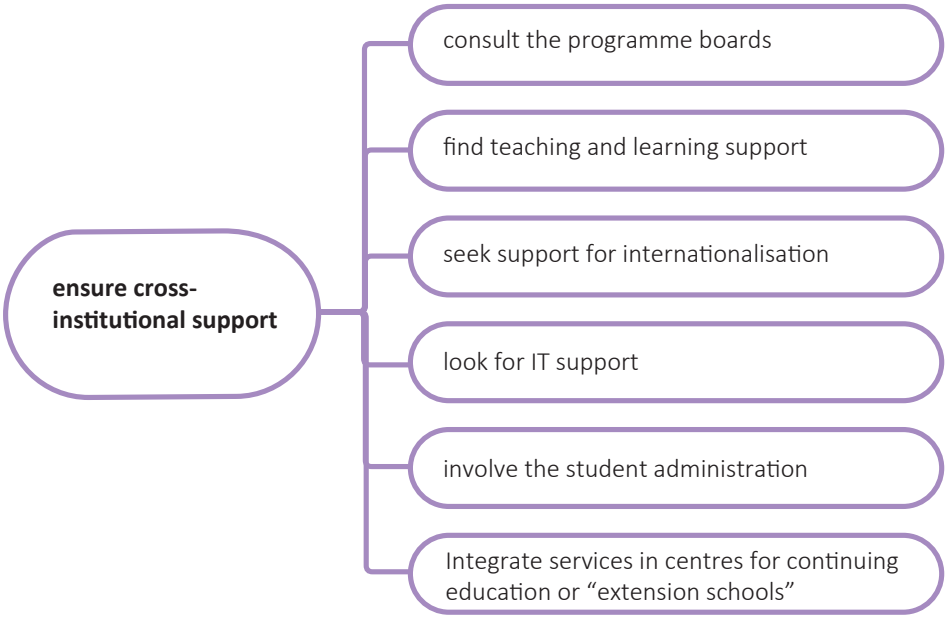

The team leader and the team partners need institutional and faculty support, which is given by professional expert services in the partnership:

- Consult the programme boards;
- Find teaching and learning support;
- Seek support for internationalization;
- Look for IT support;
- Involve the student administration;
- Integrate services in centres for continuing education or "extension schools"

In order to improve the quality of the course and reduce the design and development time and the resulting costs, support services should be contacted from the beginning of the course design, starting with the international and teaching and learning services.

In general, the team leader will first engage the support services of his university and then try to align and involve the partners in common approaches for which they should seek advice in their institutions.

European university alliances might have their own networks of support services, clustering expertise to support course and curriculum development, collaborating in research, innovation and technology, and enhancing the quality of the support services. For example, UNA Europa has clustered support services according to eight service domains (UNA Europa, 2020).

Consult the programme boards

When the micro-credential course will be part of a broader curriculum, it has to go through a faculty or university approval process. A dialogue should be started as soon as possible with the programme boards or the faculties concerned, whereby the course team leader and the team are informed about all preconditions and steps to be taken from up to the publication of the course information in the respective program guides.

Get teaching and learning support

The teaching and learning support services are essential for designing educational formats for a micro-credential. They have expertise in course and curriculum development as well as collaborative approaches to this development. Advice from this service will reduce the time and therefore the cost required to design the course as they are familiar with all aspects of the design to be covered.

Find support from internationalisation services

Internationalization services also have this expertise. On top of this, they are used to international collaboration and to develop different sorts of staff and student mobility formats. They are also familiar with all kinds of agreements which are needed for a joint micro-credential course.

Look for support from IT services

IT services will advise the team on technology facilities to deliver all digital components of the course, including synchronous and asynchronous online delivery and collaboration in discussion groups and learning communities. An important point concerns the common platform or learning environment to be used for the delivery of the course. For pragmatic reasons, the platform of the leading institution is usually used. A new common platform for the delivery of a common course offering is being considered in newly established EUI alliances, but this has not yet proven to be an easy solution (see also the section on the educational and technology ecosystem).

Involve the student administration

Particularly when the course is a standalone offering, the student administration should be involved to ensure enrollment processes for continuing education students and for the incorporation of the course and the students into the university databases and the learning environment.

Integrate micro-credential courses and curricula in centres for continuing education or "extension schools"

Some universities integrate all services to students and teaching staff related to continuing education and professional development in one institutional center for continuing education and professional development or extension school (TU Delft, 2020). At the same time, such a center acts as an interface between the university and external stakeholders such as public and private employers, sectors and professional organizations for cooperation in lifelong learning.

This integration will improve quality, specialization, scalability and outreach.

Design the joint micro-credential course

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design a micro-credential course
define learning objectives, learning outcomes, competencies
specify learning outcomes, competencies to be achieved
define EQF level for cognitive processing, skills, attitudes
ensure an academic and professional orientation
co-design with stakeholders
public and private employers
professional organisations
learners
develop a course plan and assign modular course units to course team members
ensure constructive alignment
develop a course plan and modular course units
assign course unit development across course team members
design and sequence learning activities for every course unit
choose a learning design model
design learning activities
sequence learning activities
integrate motivational elements
integrate international learning activities with embedded mobility
design joint international learning activities
intensive programmes, summer/winter schools schools
projects, think tanks
webinars, virtual classrooms
internships and service learning
develop teaching staff and student mobility
use Bologna tools
learning agreement
ECTS
define delivery mode(s)
synchronous hybrid
blended
online distance
enhance the learning experience
ensure relevant content - stimulate thinking - activate learning
balance structure and self-regulation
design course interactions
learner-learner
learner-teacher
learner-community
learner-material
learner-technology
select and align media and tools
create room for flexibility
part-time - full-time study
pace of study vs cohorts
adapted learning activities
choice between delivery modes
determine the study load
the “standard” student
structuring study load in course units
make the course inclusive
digital accessibility
gender, social inclusion, ethnicity
physical disabilities
learning disabilities
specific groups: athletes, artists
organize peer review for the course units

A joint micro-credential course is conceived as a self-contained, formal and structured learning experience that focuses on a coherent set of learning outcomes or competences and consists of learning activities in line with the course objectives and assessment criteria.
The course design requires several design steps to be taken:

- Define course objectives, learning outcomes, competences to be achieved;
- Develop a course plan and assign modular course units to course team members;
- Design and sequence learning activities for each course unit;
- Integrate international learning activities with embedded mobility;
- Define delivery mode(s);
- Enhance the learning experience;
- Design course interactions;
- Select and align media and tools;
- Create room for flexibility;
- Determine the study load;
- Make the course inclusive;
- Determine formative and summative assessment methods;
- Organize peer review for the course units.

Guidelines

In the joint course design guidelines below, we integrate the maturity dimensions, developed in the European Maturity Model for Blended Education (Dijkstra & Goeman, 2021), which have at least a face validity for digital education in general. They are based on up-to-date learning design research and validated by a Delphi study (van Valkenburg et al., 2020; Goeman et al., 2019; Goeman et al., 2021; EADTU, 2021a). For each dimension, guidelines are developed (Dijkstra & Goeman, 2021).

Taking these dimensions into account, the course team seeks a *constructive alignment* with the objectives of the curriculum. This implies that the objectives, the content, teaching and learning activities and the assessment of a course must naturally correspond (Biggs & Tang, 2011). The teaching and learning activities bridge the gap between the objectives and the assessment. taking into The characteristics of the learners are taken into account.

When the course is part of a programme, the constructive alignment can extend to the objectives of the curriculum.

This leads to the following design steps for a joint course design:

Define course objectives, learning outcomes, competencies

Describe and justify the objectives of the micro-credential course. Link them to the objectives of the wider programme, if the course is part of it or stackable within it.

Take into account both the academic and professional orientation of the course. Stakeholders can already be involved for this, for example public and private employers, professional associations or alumni. They can help analyze needs in the field and define priorities. They can anticipate on the organisation of specific learning activities such as project work or internships.

Agree on the cognitive processing and competence level of the course in terms of EQF level.

Describe the profile of the learners: their motivation to follow the course, the competences they want to acquire, their prior knowledge and experience, the available study time and work situation. For this, it is advisable to listen to (future) learners.

Define concrete learning outcomes or competencies for the course, using a consistent approach, e.g. Bloom's taxonomy revised(see: https://thesecondprinciple.com/essential-teaching-skills/blooms-taxonomy-revised/) and/or the ESCO- classification (http://www.ehea.info/Upload/TPG__A__QF__RO__MK__1__EQF__Brochure.pdf)

Develop a course plan and assign modular course units to course team members

Develop a joint course plan and divide it into modular course units, which can easily be studied in a time frame of, for example, 4 hours. This makes it possible for learners to study in blocks, possibly combined with synchronous course sessions. For example, a course of 100 hours will consist of 25 course units.

Each unit is assigned to a course team member for design and development, based on expertise in a specific area. This will lead to a rich course content and to spread design and development costs across the partnership.

The design of each unit includes the further specification of learning outcomes in relation to the overall concept of the course, the choice of content (topics, subtopics), the design of learning activities to achieve the learning outcomes, and the formative and summative assessment. In this design phase, open education resources (OER) can be consulted which can contribute to the quality of the course. OER are openly licensed online educational materials that allow teachers and learners to freely use, share, and modify (see: the Open Education Consortium; OpenLearn; France Université Numérique–Ressources).

In order to realize the course according to the joint objectives and planning, a strong coordination with the entire course team is necessary.

Design and sequence learning activities for every course unit

Use a solid learning design approach, for example

- The learning designer (Laurillard, UCL): https://www.ucl.ac.uk/learning-designer
- ABC (Laurillard, Young and Perović, UCL) (acquisition, investigation, discussion, collaboration, practice and feedback, production): https://abc-ld.org/nl/over/
- Carpe Diem Learning Design (Salmon), much related to Bloom's categories: https://www.gillysalmon.com/carpe-diem.html
- 4C/ID (van Merriënboer, OUNL, Maastricht) https://www.4cid.org/about-4cid;

Learning activities should have a meaningful sequence: a course can consist of acquisition activities through virtual lectures, followed by virtual classrooms or reading assignments, then webinars, group discussions, exercises, simulation games, and end with productive collaborative activities such as writing a publishable wiki. This makes teaching a "design science" (Laurillard, 2012).

Detailed examples of learning activities can also be found in design guidelines for flexible and scalable short learning programmes (SLPs) (Maina and et al. , 2020. See: https://e-slp.eadtu.eu/images/D42_Guidelines_final.pdf), such as learning tasks connecting theory and practice, case studies, peer learning activities, social learning activities, virtual classrooms, interactive video, augmented reality, the flipped classroom, etc.

The development of learning activities should include elements that increase student motivation, for example through interactions with teaching staff and peer learners, formative assessments that enhance motivation or through gamification (e.g. learning competition points, receiving an award for an achievement, etc.) (Antonaci, 2019).

If a micro-credential course is delivered as a MOOC on a platform such as Futurelearn, specific templates for learning design may be used. These templates can be based on the learning design approaches just mentioned. MOOC design will take into account that the course is accessible to everyone everywhere and for a large number of participants.

MOOC platforms and universities are also increasingly developing micro-credential programmes or MOOC pathways based on a coherent set of self-contained courses or MOOCs, e.g. CMF micro-credentials programmes, MicroMasters and nanodegrees (see eBook on joint micro-credential programmes)

Design international learning activities with embedded staff and student mobility

Within a micro-credential course, specific international learning activities can be integrated, such as intensive programmes, summer or winter schools, international webinars, think tanks, projects, simulations, field work, virtual labs, etc. These collaborative learning activities are jointly designed by the course team. The mobility of staff and students is then

embedded in the course. Interactions between learners and with staff are an important feature of this type of mobility.

Bologna tools are used. Mobility is the subject of the learning agreement between the learner and the partnership that is established when the learner enrolls in the programme. It is part of the course and thus contributes to the allocation of ECTS credits for the course (see section on assigning awards).

Mobility activities may also be offered as a non-compulsory or alternative option in a curriculum. In some cases, mobility is offered as an option in an honors program.

Mobility is listed in the cross-institutional ECTS course description.

Define delivery mode(s)

Determine which delivery method(s) will be used for the course and agree with the entire course team what the most important options are.

The delivery mode to be chosen is dependent on criteria such as flexibility and scalability.

More flexibility is needed for working and international learners to respond to individual time schedules and possibly different time zones. Digital teaching and learning provisions are suitable for such groups, because the internet is accessible to everyone, everywhere and at anytime.

Scalability is required for many micro-credential courses, as major needs in the economy and society must be met for many people and in multiple places. Digital teaching and learning is more scalable and therefore an important asset for continuing education and professional development.

Three key approaches to digital higher education are (Pieters et al., 2021):

- *Synchronous hybrid teaching and learning*: based on settings that have in common that both on-site or 'here' students and remote or 'there' students are included simultaneously (Raes et al., 2020; Raes, 2020)
- *Blended teaching and learning* with a deliberate mix of synchronous and asynchronous methods: based on a course design with a deliberate combination of online and offline learning activities (Biggs, 2002; Garrison &Vaughan, 2013; Goeman et al., 2019; Dijkstra & Goeman, 2020; van Valkenburg et al., 2020);
- *Asynchronous online and distance teaching and learning*: based on a course design with a continuous physical separation between teacher and student (Martin et al., 2020; Mathes, 2018)

These approaches can be combined within a course and one of these approaches can be dominant while another can be complementary. However, the general approach must be homogeneous enough for a smooth learning process.

Enhance the learning experience

For a positive learning experience, the course must meet a number of conditions. The content must be relevant for the learner and match the intended learning outcomes or competences. The course must lead to deep level understanding, be well-structured and stimulate thinking. The course should also activate the learners through adequate and meaningful learning activities. These dimensions of the learning experience must be taken into account when designing and developing each course unit.

An important aspect in digital learning is also facilitating students self-regulated learning (orienting and planning, monitoring, adjusting and evaluating) (SRL) and metacognition, for example by integrating the seven recommendations of Quigley, Muys and Stinger (2018). See: https://educationendowmentfoundation.org.uk/tools/guidance-reports/metacognition- and-self-regulated-learning/

Design course interactions

Design deliberately course interaction. Different kinds of interaction can be organized: learner-learner interaction; learner-teacher interaction; learner-community interaction; learner-material interaction and learner-technology interaction (Anderson, 2003; Stanley, 2013).

In order to be effective, each of these interactions must be facilitated. Examples of interactive formats are whole class discussions, small group or paired discussions, tutorials, seminars, online discussions, virtual classrooms, discussion of others' outputs online, organizing a peer review cycle, building a wiki or preparing a report or presentation together.

In some pedagogies, social learning is a key concept, for example, in Futurelearn's MOOC design (Futurelearn, 2022b).

Select and align media and tools

The coordination and coherence of the learning resources (learning environment, software, media, ...) used in the micro-credential course must be geared to supporting the learning activities in the course. Their use should be coordinated with the micro-credential course team and with the teaching and support staff of the lead institution. It must be informed by evidence or experience.

Tools are used for many functions in education, such as assessments and assignments, collaboration, communication, conference calls, virtual classrooms, polls and surveys, and feedback on learning performance.

In an inter-institutional setting, many tools are likely to be available in the respective institutional learning environments and can be shared. However, they should be aligned and used in a coherent way across the course units.

This rubric supports a multidimensional evaluation of functional, technical and pedagogical aspects of eLearning tools. (Lauren et al., 2018)
https://teaching.uwo.ca/pdf/elearning/Rubric-for-eLearning-Tool-Evaluation.pdf

Create room for flexibility

If needed, design deliberately flexibility for the course which means that learners can adjust particular features of the course according to their needs and preferences, for example the choice of some content and learning activities, the selection of resources, the mode of delivery (online, blended, face to face), the pace of study progress (teacher-paced/self-paced; full-time–part-time).

Online modes of teaching and learning support flexible learning schedules, enabling flexible pace and flexible places of learning, supported by technology.

Course flexibility makes learning activities accessible to all students (potentially on multiple campuses), respecting different time zones and course schedules through a trade-off between asynchronous and synchronous activities.

Determine the study load

The study load of a course for the "standard" student is to be determined in advance, taking into account the objectives of the course, the content and the learning activities planned. During the implementation stage the match between intended and achieved study load should be monitored on a regular basis. Course designers should be aware that large differences in study load can occur between students. Also, it is well known that blended and online learning can easily lead to overload. Study load indications per learning unit can help students to plan their study.

Furthermore, it is important that courses are designed in such a way that it makes it easier for learners to structure their studies, for example in 2 or 4 hour blocks, by dividing the course into course units, by planning synchronous teaching and learning in regular course sessions or by allocating a "standard" time to assignments. Structuring the study load for cohorts of students will contribute to avoiding dropout.

Make the course inclusive

Inclusiveness is a complex concept, related to issues such as digital accessibility, social inclusion, ethnicity, gender, physical disabilities, learning disabilities. It can also indicate taking measures for specific target groups such as learners at work and athletes, artists or prisoners.

This dimension means that different perspectives on students' needs and backgrounds are incorporated into course design and that students feel valued, safe and a sense of belonging.

Recently, an EADTU Task reported on new developments in policies, good practices and research and innovation for diversity and inclusion in digital education. It involved 12 countries and covered the sub-groups mentioned above (Ubachs, 2022). A website on diversity and inclusion is launched, covering all out comes of the Task Force: https://diversity-inclusion.eadtu.eu

The Universal Design for Learning guidelines are a tool to improve and optimize teaching and learning for all people based on scientific insights into how humans learn. They can help course developers to improve inclusiveness for many groups (Cast, 2018).

Organize peer review for the course units

At different stages of course design and development, quality is ensured through *internal peer review* within the course team, regarding aspects such as coherence of learning outcomes with the whole course, relevance of the content, the learning activities designed, the digital tools used, the formative and summative assessment. This quality assurance is supported by course developers of teaching and learning services.

A specific methodology has been developed for this when designing MOOCs. The design and development of MOOCs is then monitored at a number of 'quality gates', where decisions are made about the further steps in the process. This is the case, for example, in Futurelearn (Futurelearn, 2022a).

Course teams can also decide to engage an external peer review after the design phase or after the development phase of the course.

In this regard, digital courses have a comparative advantage over traditional colleges because quality assurance can take place before the course is delivered to the students. This is especially true for asynchronous parts of a digital course

Design a microlearning unit

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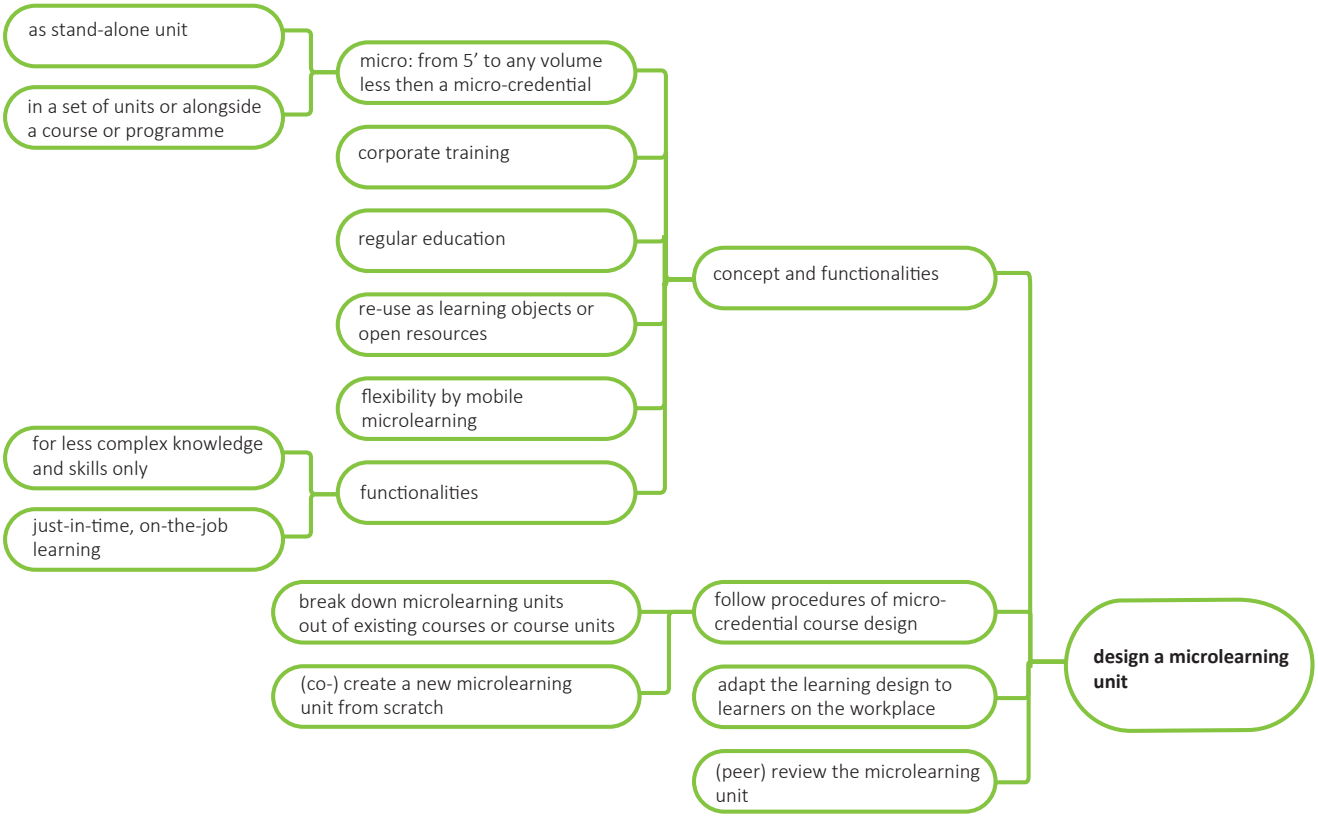

A joint microlearning unit is conceived as a self-contained, very short learning experience that focuses on one learning objective or skill for on-the-job corporate training or regular education. As for microcredential courses, a microlearning unit requires careful design:

- The concept and functionalities of microlearning units;
- Follow procedures of micro-credential course design;
- Break down microlearning units out of existing courses or course units
- (Co-)create a new microlearning unit from scratch
- Review the microlearning unit.

The concept and functionalities of microlearning units

In addition to micro-credential courses and programs, which focus on complex knowledge and skills in a specific area, there is a growing practice in micro-learning units that include a short learning experience for less complex knowledge or skills. Microlearning is an emerging topic. According to recent meta-research, it could mature and develop into a critical major trend in its own right (Leong et al., 2020).

The "micro" characteristic is central. However, there are no rules about the volume of microlearning units as it depends on the types of learners, the complexity of learning, the learning context and learning strategies adopted by the learning organization. They often range from bite-sized "nuggets" of 5 minutes to 30 minutes when used in corporate work-

place training. They can also be part of a larger set of units or alongside a program, which is the case with some typical approaches to language learning or software training.

In this section, we consider any learning experience that is less than a microcredential as a microlearning unit. In the European Commission's definition of micro-credentials, this would mean less than 1 ECTS (see Table 1)

Although microlearning is currently increasingly applied in corporate environments, there is also interest in developing microlearning units in mainstream higher education for teaching specific knowledge and skills. One of the benefits is that these units can be developed faster and used as sort of reusable learning objects or open resources that can be integrated into the design of other courses. Micro-learning units developed for business can also be used as learning objects if they comply with higher education design principles applied.

Because there is a need for flexibility for use in the workplace or anywhere, microlearning units must be suitable for use on mobile devices.

Functionalities

Microlearning units do not have the same functionality as micro-credentials, because they are short and therefore not suitable for more complex knowledge and skills. They can still provide a high-level view on a subject. Sometimes they are also used as a preparation or addition to a more complex online course or programme.

Therefore, microlearning is not the answer to every learning need. It focuses on solving one problem or answering one question at a time. It cannot therefore be used to provide broad, fundamental knowledge on any subject. It's great for on-demand microlearning, but it should be found right when needed (Tipton, 2020). Microlearning is also used to introduce customers to a product, train salespeople to sell products, etc.

In a corporate learning context, microlearning units are in particular suitable for just-in-time and on-the-job training for a particular task or for the training of professional knowledge and skills, also for 21st century skills. For employers, making learning available at the point of need is a seamless way to blend learning into the regular flow of work activities, supporting a culture of learning (Tipton, 2020).

Because microlearning units are short, they can be developed and delivered faster, responding to changing business goals and new training demands (Andriotis, 2018).

Guidelines

Follow procedures of micro-credential course design

The design of micro-learning units should follow the same rules of constructive alignment as is the case with the development of micro-credentialing courses: first the learning outcomes or competences should be defined in terms of knowledge and skills and learning activities should be designed starting from the learner's prior knowledge or skills.

There are at least two alternative avenues for developing microlearning units: breaking down microlearning units from existing courses or course units, or (co-)creating a new microlearning unit from scratch.

Break down microlearning units out of existing courses or course units

As a first alternative to developing microlearning units, it may be appropriate to split an existing course or course unit into modular, self-contained microlearning units suitable for workplace learning. Existing course content is used because it is broken down into specific small knowledge or skill components for on-the-job training in corporate training environments.

The advantage of this approach is that the content of these microlearning units is already developed and they share the credibility of courses that may already have been credited.

The pitfall of using existing course material is that it is not entirely suitable for learning in a corporate environment, neither from a content standpoint nor from a microlearning course design perspective (see below). When taking it to a corporate environment, adjustments are necessary.

(Co-)create a new microlearning unit from scratch

The second alternative is the development of completely new microlearning units, possibly in co-creation with employers or professional associations. The collaborative design of such microlearning units may include the analysis of the specific knowledge or skills required, the development of learning activities relevant to the business environment and ultimately the professional approval or recognition of the unit. Universities in this case provide content, based on research and innovation, and support the learning design of the programme. During the process it can be decided that a microlearning unit can be stacked into a micro-credential course, possibly in combination with other units.

In this second alternative approach, it may be more difficult to gain recognition for a self-contained microlearning unit in an academic setting. The academic valorization of a microlearning unit assuring access to a broader academic course or programme may require a procedure for the recognition of prior learning or experience. However, universities

and quality assurance bodies are thinking about ways to identify these types of micro-learning units.

Adapt the learning design to learners on the workplace

Microlearning for workplace learning should preferably be limited to one learning objective or skill. The content should be short and focused and capture the essence of what is being taught. The connection to other units in a wider set of units or a course should be clear.

The design should be attractive, because students learn independently. A wide variety of formats are used. Here are some examples of microlearning activities (see also: Andriotis, 2018):

- reading a text (sentences, short paragraphs);
- listening to a short podcast;
- watching a short video clip (animations, simulations);
- learning with microgames;
- learning with apps;
- social/cooperative learning with social media;
- analyzing images (photos, illustrations, infographics);
- completing tests and quizzes (micro-assessment to assess progress);
- writing a reflection on just viewed content;
- remembering a word, vocabulary, definition or formula;
- making practical exercises.

Self-evaluation will increase learner control and encourage students to engage in ongoing training activities

Review the microlearning unit

An advantage of online education courses is that they can be reviewed before they release to real learning situations. in the case of microlearning units, peer reviews can be done by academics or employers.

Agree on assigning an award

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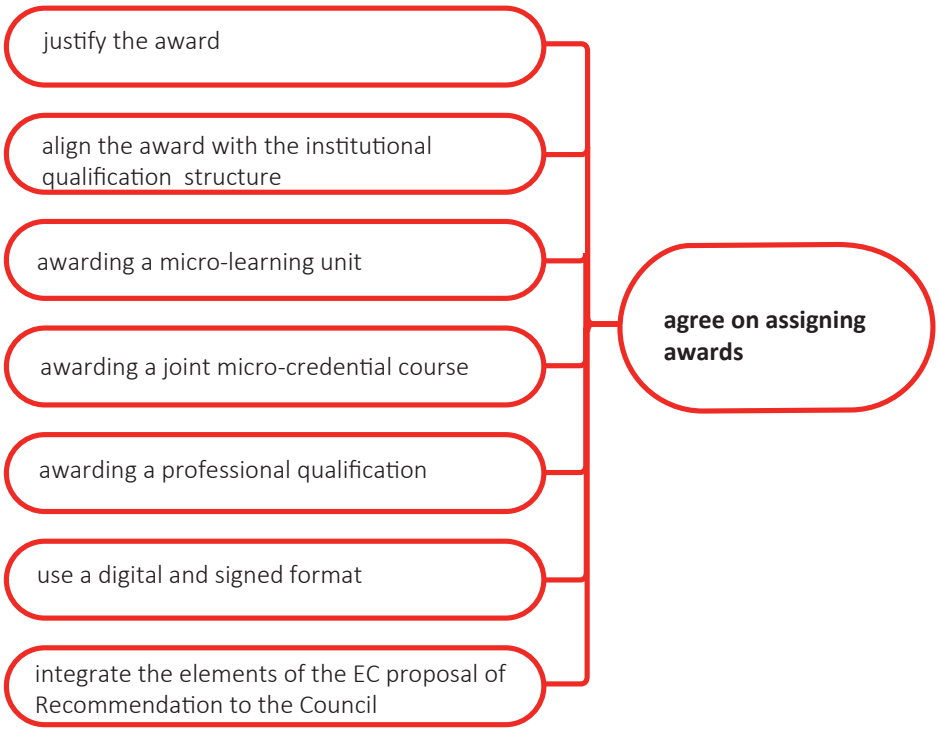


The partnership must agree on a joint award for the joint micro-credential course. Successive decisions must be made;
• Justify the award;
• Align the award with the institutional qualification structure;
• Awarding a micro-learning unit;
• Awarding a joint micro-credential course;
• Awarding a professional qualification;
• Use a digital and signed format;
• Integrate the elements of the EC proposal of Recommendation to the Council

Justify the awards

Justify why the joint micro-credential course should lead to academic recognition by the partner universities and which joint award should be delivered. Take into account the content, the EQF level, the volume of the course and the possible stackability to a programme.

Also seek professional recognition from external stakeholders, such as professional organizations and employers, so that learners can valorise their micro-credential award for professional development credits or accreditation by professional bodies (e.g. related to professions in psychology, IT, medicine/healthcare, accountancy, education, business sector).

Align the award with the institutional qualification structures

Participating institutions are likely to have very different institutional qualification structures for continuing and professional development, as can be seen from the study guides. These structures are adopted autonomously by institutions and possibly align with national and evolving European frameworks.

Partners should agree on a common award for the joint micro-credential course, as far as possible in line with the formal requirements of each institution. This calls for careful discussion.

Not all universities have developed a consistent qualification structure, and neither have governments. In fact, many institutional qualification structures are under development and in most cases not yet stable (see eBook on micro-credential programmes).

Institutional qualification structures might converge to the following characteristics and changes:

- *a microlearning unit* has a learning volume of less than 1 ECTS and is therefore smaller than a micro-credential. No credit award can be awarded, but it can possibly be awarded with *a badge* (of attendance participation or completion). The course can serve as a stand-alone unit (for example in corporate training) or as a unit in a credited course;

- a micro-credential course provides a reliable and valid assessment for which transferable *ECTS points* are awarded, in most higher education institutions more than 1 ECTS. The course can serve as a stand-alone offering (for example in corporate training) and possibly can be stackable to a broader educational programme;

- a CMF micro-credential programme is delivered as a coherent track of courses with a total volume of 4-6 ECTS, which is awarded with *a CMF micro-credential qualification*. This qualification can be stacked into a broader programme (European MOOC Consortium, 2018).

- A microdegree is delivered as a micro-credential programme of 20-40 ECTS, which is awarded with a *microdegree qualification.* Many existing programmes in higher education would meet the criteria for micro-credential programmes with this volume of learning.

- A degree is provided in the form of a *bachelor's or master's degree* (180, rep.60/90/120 ECTS). This degree qualification may be awarded following a modular series of micro-credential qualifications, supplemented by a thesis.

From learning unit to degree programme	Volume (ECTS)	Level	Award
learning unit/micro-learning	Less than 1 ECTS	undergraduate EQF level 5, 6 postgraduate EQF level 7,8	a badge/proof of attendance (can be part of a course or stackable to a course)
a single course a micro-credential course a single MOOC with credits	Number of ECTS credits awarded to the course	undergraduate EQF level 5, 6 postgraduate EQF level 7,8	ECTS course credits (stackable to a programme)
CMF- micro-credential programme MOOC pathway	**4-6 ECTS**	undergraduate EQF level 5, 6 postgraduate EQF level 7,8	**CMF micro-credential gradeo (stackable in a micro-credential programme or a degree programme)**
micro-credential programme Micro-degree programme MOOC-based programme	**20-40 ECTS**	undergraduate EQF level 5, 6 postgraduate EQF level 7,8	**under/postgraduate certificate microdegree specialisation certificate expert certificate certified professional programme focus diploma MicroMaster nanodegree diploma .... (stackable to a degree)**
degree programme (bachelor/ master/doctorate)	180 ECTS 60-90-120 ECTS 240 (180) ECTS	undergraduate EQF level 5, 6 postgraduate EQF level 7,8	short cycle graduate bachelor/master degree doctorate degree

Table 1- Proposal for a qualification structure for continuing education and microcredentials reflecting current practices

Layers or exit points in this framework are defined based on the learning volume and the EQF qualification levels. An extra layer with a volume of 10-20 ECTS points is probably needed, as experienced in practice. Layers or exit points with a higher learning volume may also be suitable, e.g. for certain undergraduate and postgraduate programmes, depending on the overall qualification structure adopted by the institution. In the definition of this framework, the ability of learners to combine learning and working should be of prime importance.

Award a professional qualification

Micro-credential courses are sometimes co-created, endorsed or accredited by a professional organisation, business sector or public service (health care, education,...). These

organizations recognize these courses in their own continuing professional development framework. In this way, micro-credential courses can sometimes be financed by the sector or recognized for a personal learning account. In some cases, they will issue a specific professional credit in addition to the academic award of the university partnership.

Use a digital and signed format

The course should be awarded in a digital and signed format, for example, the European Digital Credentials (EDC) (Europass, 2022; ECCOE, 2022)
European Digital Credentials for Learning include diplomas, transcripts of records and a wide variety of other types of certificates of learning achievement. They are multilingual and signed with a unique electronic seal (that is the digital equivalent of an institution's rubber stamp). This allows education and training institutions to easily authenticate, validate and recognise credentials of any size, shape or form.

As described in Europass, European Digital Credentials for Learning can describe and certify:

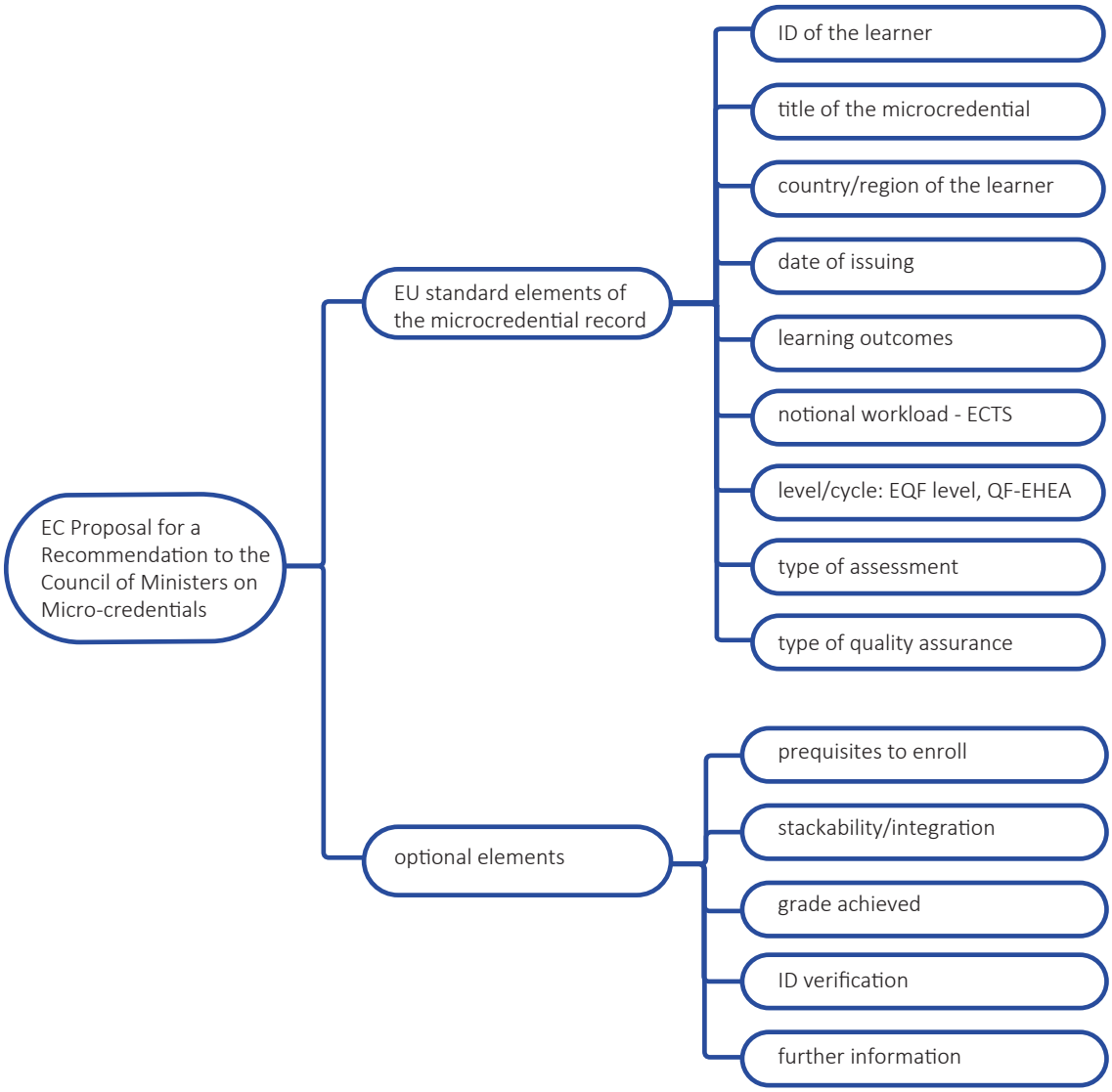
- qualifications (e.g. professional certificates, university diplomas and other learning achievements);
- activities (e.g. participation in classes and non-formal learning events);
- assessments (e.g. transcripts of records), and
- entitlements (e.g. right to enroll in learning opportunities, or to undertake an occupation.

Integrate the elements of the proposal of the European Commission

The development of micro-credentials in a lifelong learning perspective is now a top priority of the European Commission. In the context of the European Education Area and the European Digital Education Plan, the European Commission recently issued a Proposal for a Recommendation to the Council of Ministers on Micro-credentials (European Commission, 2021b), which is expected to be implemented by Member States in 2025, recognizing micro-credentials as qualifications for continuing education and professional development in the European Higher Education Area (the Bologna Process). See definitions in the first section on the concept of micro-credentials in this eBook.

These elements are already included in the Common Microcredential Framework (see detailed description in the eBook on joint Micro-credential Programmes) and are required to ensure that all qualification levels of microcredentials (Table 1) are readable by academia and employers.

Member States are requested to implement this Recommendation as soon as possible and submit a plan by (insert date 12 months after adoption by Council) setting out the corresponding measures to be taken at national level to support the achievement of the objectives of the Recommendation by 2025.



Elements of the Proposal of the European Commission to the Council of Ministers on Microcredentials

In this discussion, it is important that universities work together in dialogue with national governments, other stakeholders, and the EU to develop a qualification framework for continuing education and professional development.

Determine formative and summative assessment approaches

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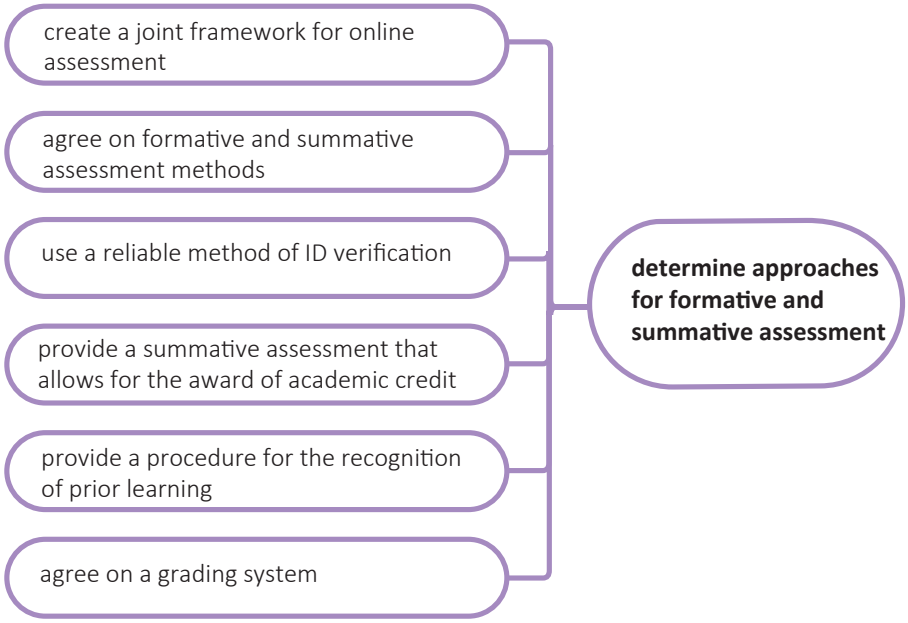

The course team develops joint formative and summative assessment approaches:
• Create a joint framework for online assessment;
• Agree on formative and summative assessment methods;
• Use a reliable method of ID verification at the assessment point;
• Provide a summative assessment that allows for the award of academic credit through course completion;
• Provide a procedure for the recognition of prior learning in case a micro-credential course didn't lead to an academic credit;
• Agree on a grading system.

Guidelines

Create a joint framework for online assessment

Recently, an EADTU Special Interest Group has shared expertise on institutional strategies and experiences on online assessment (Rossade, Janssen, Wood & Ubachs, 2022). It first made an inventory of assessment practices and problems faced due to COVID-19. Further, it discussed about forward looking developments in online assessment including the recommendations of the TESLA project (TESLA, 2019). It examined research and innovation on online assessment and discussed also about institutional strategies, including examples from practice as well as national policies and frameworks.

Main themes in the report are about assessment design, trust and ethics, operational processes and the assessment future. It is useful that the joint course team reflects on some of these aspects and builds its own practical framework. See also: https://online-assessment.eadtu.eu.

Within such framework, some minimum requirements must be agreed. Here follow some basic guidelines.

Agree on formative and summative assessment methods

During the course, formative assessment is organized to support learning and to adapt or differentiate education. Common forms of formative assessment in online learning are quizzes, self-assessment, peer assessment, and learning agendas for practicing learning. For all these modes, giving feedback is important.

Learning analytics supports the formative assessment of online learners by the collection and analysis of data for the purpose of understanding and improving learning outcomes (Lang, C., Siemens, G., Wise, A., Gasevic, D., 2017; Solar, Society for Learning Analytics Research, 2022).

Regarding summative assessment, it is important that students know the exam criteria and exam methods for a course in advance, so that they can tailor their learning to the learning outcomes and competences they need to achieve through the course.

The way in which the exams are taken is in principle determined when the course is designed. In many micro-credential courses, summative assessment is organized at the end of a course unit after completion of successive formative assessments.

Partners should agree on a joint examination method to assess learner performance, including solutions for identity verification and proctoring exams. Latest developments are discussed in the TESLA project (TESLA, 2019) and the Special Interest Group mentioned above.

Seek support for assessment methods in the teaching and learning services.

Use a reliable method of ID verification at the assessment point

The assessment method is in accordance with the policies of the partner universities or widely adopted across the universities (more than one method may be used) (Iniesto, 2021). Examples are:

- platform/LMS ID verification: match the student's own photo via a selfie or a webcam with an ID;
- university registration: students complete a registration process within the university as undergraduate students;
- interview: conduct an interview on the university grounds (oral exams on site)
- conduct a short online interview to verify the student's identity and work (online interviews);

- record a presentation as part of a capstone project[1] (recorded presentations)

The ID verification method has been checked as accessible for participants with accessibility needs.

Provide a summative assessment that allows for the award of academic credit

Typical approaches are (Iniesto, 2021):

- computer-based assessment: these assessments can be a final proctored exam, or quizzes based on case studies and coding projects[2];
- teacher assessment: teacher assessments are often observed on essays and capstone projects;
- multiple-type rating: mix of computerized assessment and teacher-graded assessment.

Provide a procedure for the recognition of prior learning in case a micro-credential course didn't lead to an academic credit

This assessment must be conducted by a recognized university for the purpose of identifying, assessing and formally recognizing past learning and achievements, which are taken into account when a student is admitted to a formal qualification. According to the ECTS Users' Guide, full authority for this recognition is given to university institutions. They will apply the procedures as laid down in the ECTS User Guide. This procedure identifies, documents and formally assesses a previous learning experience, which can then be certified and lead to partial or full qualification.

Agree on a grading system

European universities are likely to use different grading scales, for example 1-20; 1-10; 1-5 or 1-30. In some countries, almost a binary pass-fail system is used without further distinction. Performance on these different rating scales is often difficult to compare and can complicate the transfer of records as the programme team must agree on awarding a final grade or certificate to each student.

It is important that partners choose a common rating scale for the course (preferably the scale of the leading university, for example 1-20). Individual universities can use a transcription table in case they want to use these grades in wider programmes or for adoption in institutional data bases.

1 A capstone project is a culminating assignment, on which students usually work at the end of the academic course or programme, eg an essay, research paper or thesis.

2 Coding projects are one of the many ways you can learn the coding skills for programming.

Assure quality

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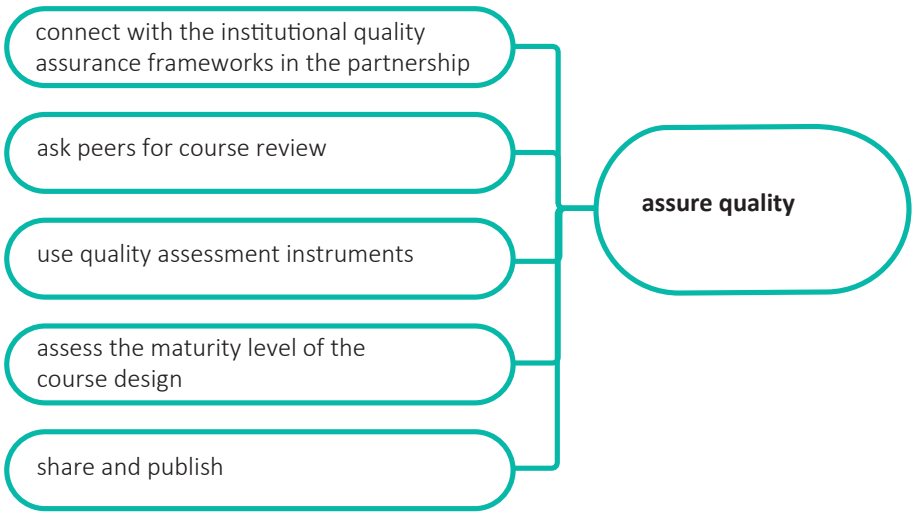

The quality assurance for a joint micro-credential course is a common responsibility of the course team. In this respect decisions have to be taken as:

- Connect with institutional quality assurance frameworks in the partnership;
- Ask peers for course review;
- Use quality assurance instruments;
- Assess the maturity level of the course design;
- Share and publish

Guidelines

Connect with institutional quality assurance frameworks in the partnership

The course team draws up a quality assurance plan for the joint course, building on the internal quality assurance approaches of the respective universities. Possibly, partner universities have installed a quality assurance approach for joint courses.

The course team is jointly responsible for the scientific content and the EQF level of the course.

Quality assurance takes into account a variety of criteria and indicators, in particular:
- learning progress and success throughout the course;
- compliance of the learning results with the pre-specified learning outcomes and competences;
- the learning experience and satisfaction during the course;
- the content and level of the course;
- data from learning analytics.

The institutional quality assurance procedures will comply with ENQA Standards and Guidelines for Quality Assurance in Higher Education. For the aspects of online learning, it follows the Considerations of the ENQA Working Group on Quality Assurance and E-learning.

Ask peers for course review

Typical for asynchronous online learning units is that they can be evaluated by peers before they are implemented in real life. In many universities, this evaluation is a standard procedure in the development phase of the course, even when members of the course team have continuously discussed each others' learning units beforehand.

Use quality assurance instruments

E-xcellence is a quality assurance instrument for blended and online education. The self-assessment tool is accompanied by and extensive manual offering guidance for improvement, covering blended and online course and curriculum design, student and staff support and strategic management.
Both the manual and the tool can be relevant when teaching staff is designing and developing a course, also before implementation. See: https://e-xcellencelabel.eadtu.eu-/e-xcellence-review/manual

E-xcellence offers also onsite reviews for ex post quality assurance

Assess the maturity level of the course

The *European Maturity Model for Blended Education* (EMBED) can be used to assess the maturity level of courses, programmes and institution-wide provisions for blended education. The concept of maturity refers to the degree of regular deliberate optimization of the design of blended education and evidence-based decision-making by the course team and individual teaching staff. See: https://embed.eadtu.eu/download/2517/EMBED%20implementation%20guidelines.pdf?inline=1

Share and publish

As education is a design science, it is good practice that teaching staff and course teams publish about the design, the development and implementation of courses as is done in other design sciences (architecture, engineering, etc.). By sharing and publishing, teaching staff will level up their own ambitions and create a culture for developing quality courses in the higher education community (Laurillard, 2021).

Also, course material can be published in open educational resource databases or courses can be made available for learners to learn in their own pace

Develop a business plan

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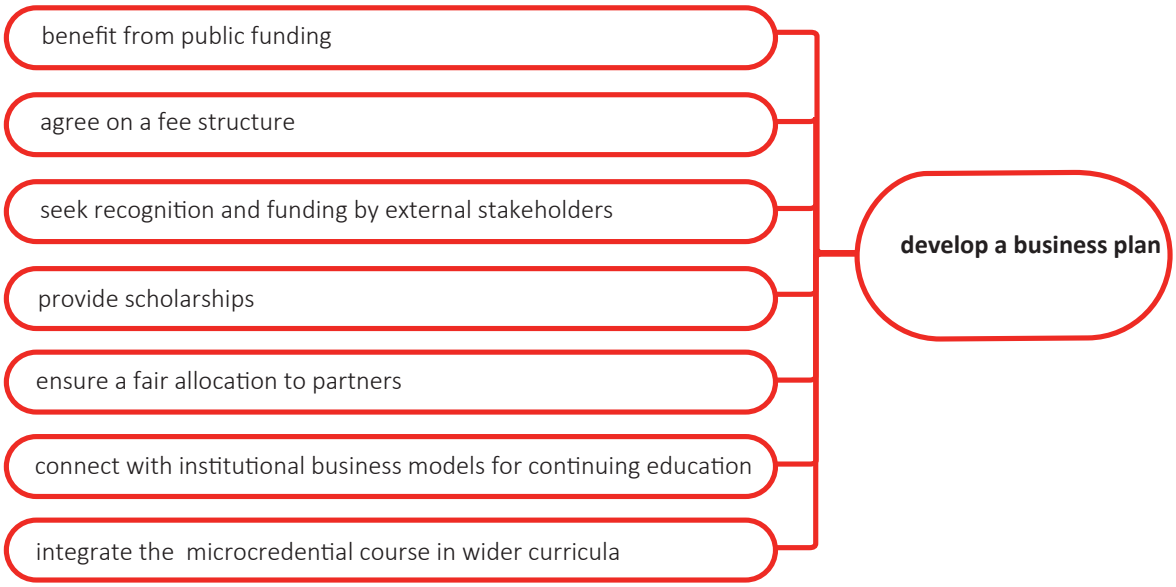

The course team has to develop a business plan for the joint micro-credential course, which is depending on a set of parameters
• Benefit from public funding;
• Agree on a fee structure;
• Seek recognition and funding by external stakeholders;
• Provide scholarships;
• Ensure a fair allocation to partners;
• Connect with institutional business models for continuing education;
• Integrate the micro-credential course in a wider curriculum.

Guidelines

Benefit from public funding

National funding of micro-credential courses and programmes can vary widely from country to country. In some countries, these programmes are not recognized for funding. Recognition would ensure that they can be funded as parts of continuing education.

Project funding is supportive, but not sufficient to ensure the long-term sustainability of a micro-credential course.

In a start-up phase, a micro-credential course can eventually be funded by European programmes such as Erasmus+, for example, Sectoral Alliance on Skills (See: https://ec.europa.eu/programmes/erasmus-plus/programme-guide/part-b/key-action-2/partnerships-cooperation/alliances-innovation_en) or the European Social Fund (see the national ESF agencies).

Most importantly, the development of joint micro-credential courses and programmes is funded under the European Universities Initiative (EUI), through which alliances develop innovative educational formats for blended or online continuing education.

Agree on a fee structure

The partners jointly determine a registration fee for the micro-credential course. Ultimately, they can differentiate this fee for individual and collective subscriptions. They must ensure that individual fees are affordable for learners.

A complicating factor is that higher education tuition fees generally vary from country to country and in some countries even tuition fees are not paid.

When determining fees, partners must balance the fees in different national systems and other public and private revenue streams on the one hand, and the operational costs of the course on the other.

They may consider that online courses are more scalable and therefore the marginal cost per student may be lower, which may affect the fee structure for the course.

Seek recognition and funding by external stakeholders

In some areas relevant to employment and innovation, partners can spark the interest of external stakeholders such as companies, business sectors or professional organizations to recognize and support a micro-credential course, for example through sectoral funds.

In some countries, personal learning accounts are created that support learners to participate in continuing education courses.

Provide scholarships

In the case of high enrollment fees, joint micro-credential courses may provide scholarships to individual students sponsored by companies or other stakeholders.

Ensure a fair allocation to partners

In public funding, partners are bound by national regulations. When developing business models, fees and private funding streams can be allocated to partners based on their actual contribution to the course.

Connect with institutional business models for continuing education

Joint micro-credential courses are an integral part of an institution's continuing education provisions. At the same time, they are co-owned by each individual partner university.

Therefore, within this common framework, they should be managed as a separate entity in each institution. In order to promote innovation, the revenue streams for micro-credential courses should be allocated directly to the faculty and to the joint course team.

Institutional business models for continuing education might mirror those for innovation and knowledge transfer.

Integrate the micro-credential course in a wider curriculum

Universities can also valorize micro-credential courses in wider micro-credential programmes or in bachelor or master degree programmes. As such, they can also be presented to other universities for mobility.

Develop a recruitment plan

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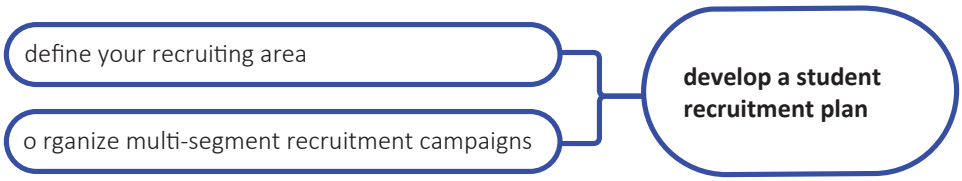

Guidelines

Define your recruiting area

Depending on the objectives and format of the joint micro-credentials course, partner institutions can recruit learners at national, European and global level. In the case of transnational delivery, course and program designers must consider the characteristics and contexts of learners outside their institutions or partnership. Micro-credential courses developed in an EUI university alliance are by definition international and may be designed to recruit international students, as MOOCs do.

The SLP4you, http://slp4you.eadtu.eu, and MOOCs4you (MOOCs for the labour market, https://moocs4you.eadtu.eu) portals give learners access to information about micro-credential courses and programmes and link them to their website, where they can register and start the admission process.

Organize multi-segment recruiting campaigns

The partnership should organize recruitment campaigns for transnational delivery. That is why universities and alliances need a website for micro-credential courses and programmes which they run. This website clarifies the objectives and profile of the courses and programmes, participating universities, awards given, student profile and testimonials, and registration procedures.

Recruitment campaigns can be set up targeting companies, business sectors, professional associations, alliances and networks, as well as individual students. Various communication channels can be used, such as research and education journals, mailings, columns, blogs, and by participating in conferences and educational events. Communication and recruitment campaigns should be set up for each target group segment.

Develop a sustainability framework

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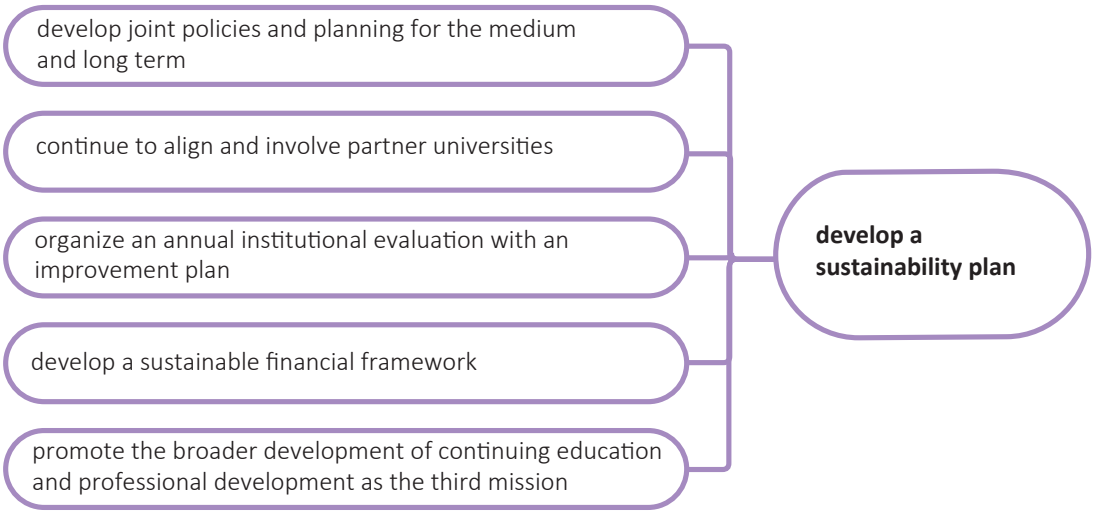

The partnership develops a sustainability framework based on a strong basis:

- Develop joint policies and planning for the medium and long term;
- Continue to align and involve partner universities;
- Organize an annual institutional evaluation with an improvement plan;
- Develop a sustainable financial framework;
- Promote the broader development of continuing education and professional development as the third mission.

Guidelines

Develop joint policies and planning for the medium and long term

The course team defines a medium- and long-term policy and planning for the joint course with qualitative and quantitative milestones related to attracting (inter)national students, income streams, study progress and success, learning agreements with third universities, collaboration with stakeholders and other factors to consider.

Continue to align and involve partner universities

The course team remains aligned and committed to the shared objectives, main structure and pedagogical principles of the course and the qualifications awarded. They regularly assess the relevance of the course to the individual universities.

Organize an annual institutional evaluation with an improvement plan

The course team conducts an annual course evaluation with recommendations for improvement. The assessment may address dimensions such as the relevance and sequence of the learning activities, the alignment of media and tools, the embedment in the technological infrastructure of universities or the platform used, course interactions, learning

communities and discussion forums, the student learning experience and workload, the flexibility and inclusiveness of the course.

The E-xcellence instrument and the European Maturity Model for Blended Education can contribute to this evaluation.

Develop a sustainable financial framework

The course team should develop a medium and long-term financial plan, based on the original business plan, comprising revenue streams from public funding, tuition fees, external stakeholders and sponsored scholarships. The plan also relates to the allocation of budget streams to individual partners.

The institutional frameworks for continuing education must also ensure that course revenues are allocated to the faculty and to the joint course team according to the financial planning.

The plan will also be flexible, taking into account foreseen and unforeseen changes. Therefore, it should be reviewed annually with advice from financial experts.

Promote the broader development of continuing education and professional development as the third mission

Partner institutions should promote the institutional development of continuing education as a comprehensive offering, alongside regular degree programmes and in line with the university's social mission to meet large-scale needs in society and in the economy. Micro-credential courses and programmes will be structurally embedded and supported in such an approach, which will also support them through extension school or another continuing education structure.

In this perspective, the partner universities should also participate in the upcoming discussions on micro-credentials at national government level to ensure a national framework for the recognition and funding of continuing education.

Conclude a consortium agreement

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In order to consolidate joint responsibilities and activities, a consortium agreement must be concluded regarding:

- the composition and role of the course team
- the objectives of the micro-credential course;
- the main structure of the micro-credential course;
- the shared pedagogical principles;
- the mode of delivery;
- mobility schemes related to some course units
- the award given;
- the language policy;
- the admission;
- the examinations;
- the quality assurance mechanisms;
- the financial management.

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