



Institutional development for CEPD and micro-credentials



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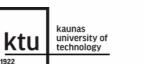


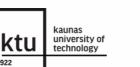


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Executive summary

In the context of the Erasmus+ funded project MCE, work package 3, a survey was conducted to gather information from the project partners on the strategic institutional framework in which micro-credentials and short learning programs (SLPs) are offered. The objectives of WP3 are, among others, analyzing and mapping current qualifications in the partnership (achieved; see Weiß, Zeman, Elsholz, Hutgens, Antonaci (2023): "Analyzing and mapping of current institutional qualifications for continuing education and professional development and micro-credentials in the partnership", 2023) and comparing institutional Continuing Education and Professional Development (CEPD) policies and strategies in line with the institutional action plans (2021), which will be obtained in this deliverable. This report offers a comparison of institutional policies, strategies, and frameworks for CEPD and micro-credentials considering new perspectives on the transformation of higher education. It complements the findings of Weiß et al. (2023), which was based on the same survey, but with a different emphasis, namely on denominations for and characteristics of existing shorter, non-standard learning programs within the partnership and on the institutional perspective on possible drivers (motivations) of students engaging in micro-credentials (Weiß et al. 2023).

For this report on institutional development for CEPD and micro-credentials, the whole MCE consortium, with ten partners have contributed, submitting information on their current strategic vision and structure of micro-credentials, their institution's mission, related quality policies, the financing models for short learning programs, their relationship with key stakeholders, their view on the types of students most probably interested in short learning programs, and their plans of national and international collaboration regarding CEPD and micro-credentials. More in detail the universities involved were the FernUniversität in Hagen, Germany (FernUni); the Hellenic Open University, Greece (HOU); Katholieke Universiteit Leuven, Belgium (KU Leuven); Kaunas University of Technology, Lithuania (KTU); the National University of Distance Education, Spain (UNED); the Open Universiteit, the Netherlands (OUNL); Universidade Aberta, Portugal (UAb); Università Telematica Internazionale UNINETTUNO, Italy (Uninettuno); the Universitat Oberta de Catalunya, Spain (UOC); and the Open University of Cyprus, Cyprus (OUC).

The report summarizes these findings according to institutional strategy and frameworks and quality and funding policies, seeking to provide interpretative insight and conclusions to assess the current and future positioning of short learning programs and microcredentials in the partnership. The deliverable contributes to supporting university leadership in the development and progressive implementation of transformative institutional policies, strategies, and institutional preconditions for forward-looking CEPD and micro-credential programs and qualifications in response to the demands and expectations of lifelong learners, the mission and strategy of the specific institution, the economy, and society as a whole.



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1. Introduction

In the past years, there have been numerous consultations and discussions on microcredentials at the European level. In 2021, the Council of the European Commission published the "Council Resolution on a strategic framework for European cooperation in education and training towards the European Education Area and beyond (2021-2030)" (EC 2021a) and highlighted micro-credentials as one of the many items in the Council's priority areas during the first cycle (2021–2025) (EC 2021a, p. 17): "Exploring the concept and use of micro-credentials can help widen learning opportunities and could strengthen the role of higher education and VET in lifelong learning by providing more flexible and modular learning opportunities, and offering more inclusive learning paths" (EC 2021a, p. 18). What initially sounded like a somewhat vague approach to micro-credentials rapidly took a more concrete turn. In December 2021, the Council of the EU published its "Proposal for a Council Recommendation on a European approach to micro-credentials for lifelong learning and employability" to member states. It was adopted in June 2022 and "seeks to support the development, implementation and recognition of microcredentials across institutions, businesses, sectors and borders" (EC 2022c). By the end of 2023, this Recommendation needs to be implemented at national level. It was published alongside another proposal on individual learning accounts (EC 2021d) that shows the growing importance of flexible and inclusive learning opportunities as well as lifelong learning.

The 2021 recommendation includes a common definition and presents European standard elements to describe micro-credentials (annex 1) alongside "principles for the design and issuance of micro-credentials" (EC 2021b, annex 2). The press release concerning the recommendation highlights its goals, which include "building trust [in micro-credentials] and enhancing [their] flexibility" and "filling the skills gap[s]" that the COVID-19 pandemic as well as the green and digital transition have caused (EC 2022b). This also emphasizes how urgently micro-credentials are needed in our constantly changing society and labor markets. However, there is also a necessity to enable people to cope with current and future challenges, through "[a]n effective culture of lifelong learning [which] is key to ensur[ing] that everyone has the skills they need to thrive in society, the labour market and their personal lives. It is essential that people can access quality and relevant education and training, up-skilling and reskilling throughout their lives" (EC 2021b, p. 10).

According to the definition given by the EC Recommendation,

"[m]icro-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. (EC 2021b, p. 14)

2. Survey of institutional strategies and policies on micro-credentials

The Erasmus+ funded project MCE started on 1 April 2022 to contribute to the further conceptualization of micro-credentials and to their definition via national, institutional, and EU-level policies and frameworks. Under the coordination of EADTU, the ten partners are working together to provide evidence base and support further institutional developments for the transformations needed to ensure high-quality, trusted, and widely recognized micro-credentials.

Within the MCE project, the FernUniversität in Hagen leads the work package on institutional leadership and micro-credentials (WP3), which aims to support university leadership in the development and progressive implementation of transformative institutional policies, strategies, and institutional preconditions for forward-looking CEPD and micro-credential programs and qualifications in response to the demands and expectations of learners, institutions, the economy, and society. Specifically, the WP3 objectives include comparing institutional policies, strategies, and frameworks for CEPD and micro-credentials in light of new perspectives on the transformation of higher education and the future of Europe's universities (Europe's Universities 2030), taking the learners' perspective into account (mainly dealt with in the work package on investigating modularization and micro-credentials from the learners' perspective (WP2)) as well as analyzing and mapping the current institutional qualifications for continuing education and professional development and micro-credentials within the partnership. Further goals are to harmonize and align micro-credentials with EU policy and build an institutional ecosystem for continuing education.

To accomplish these objectives, the FernUniversität has designed and carried a survey composed of the following three sections: (1) Institutional Strategy and Frameworks;(2) Quality Policies and (3) Funding Policies. It was distributed in May 2022 online, using the open-source tool LimeSurvey and was mainly made up of single- or multiple-choice questions as well as a small number of open-answer questions. All ten partners contributed to the collection of data, but not all the partners were able to respond to all the questions in the survey. The participants were invited to ground their answers based on all the institutional offerings that might fall under the definition of the EC Recommendation, irrespective of whether they already call them micro-credentials. As the partners are mainly distance-learning institutions, the offerings are (mainly) blended or digital micro-credentials.

The structure of this report unfolds as follow: first reports on the three sections of the survey summarizing the findings in relation to the current micro-credentials-qualifications in the partnership, then identifying the learner's drivers in relation to micro-credentials, which were extensively analyzed in deliverable D3.2. (See Weiß et al. 2023).



3. Findings

3.1. Institutional policies

The sample representing this fundings is composed by distance higher education universities, i.e., UNED, UOC, OUNL, UAb, FernUni, Uninettuno, HOU and OUC; associations of on-campus universities, i.e., KTU; and on-campus university with online educational units, such as KU Leuven. The diversity of this sample is not only represented by their institutional structures but also in their funding models and broader national policies related to CEPD, LLL, SLPs and micro-credentials.

The partners still differ greatly regarding the large-scale development of CEPD and microcredentials in terms of development stage, mainly due to the different national regulatory contexts, although progress has been made with the E-SLP project (https://e-slp.eadtu.eu/), preparing them for the change happening at European and national policies and frameworks for micro-credentials. On the strategic level, the results seem very promising. Our survey has shown that all partners have policies and strategies for continuing education and professional development.

The following table represents the question (Q) 2, which asked the partners about existing strategies and policies regarding CEPD, Q1 will be detailed later:

Q2: What is the policy and strategy, in your organization, in relation to continuing education and professional development (CEPD) in general, and MCs in particular?

Table 1: Institutional strategies for CEPD

Partner	Strategy
Uninettuno	At policy level, continuous professional development is
	clearly part of the mission of UNINETTUNO University;
	"empowering CPD for workers and professionals" is
	mentioned in article 1, paragraph 2 of the ministerial decree
	establishing the university (here in the update published in
	the National Official Gazette in 2017
	(https://www.uninettunouniversity.net/it/gazzetta-ufficiale-
	numero-47-14-febbraio-2017.aspx). In the UNINETTUNO
	didactic offerings, beyond formal programs (Bachelor's and
	Master's degrees, and the so-called "University Masters"
	there are 60 to 120 credits post-graduate programs that are
	part of the Italian Higher Education national framework
	(http://www.quadrodeititoli.it/altrititoli.aspx?IDL=2).
	UNINETTUNO offers "professional qualification courses"
	(corsi di qualificazione professionale) and "short learning
	Programs" (same formula used in Italian language).
	Currently, the first category includes courses meant for
	mandatory continuous professional education for specific
	professional categories, such as lawyers



	(https://www.uninettunouniversity.net/it/corsiaggiornamenti-avvocati.aspx); civil engineers and architects (https://www.uninettunouniversity.net/it/corsocertificazione-energetica.aspx; https://www.uninettunouniversity.net/it/b-i-m-professional-course.aspx); healthcare professionals (https://www.uninettunouniversity.net/it/educazione-continua-in-medicina-ecm.aspx) and teachers (https://www.uninettunouniversity.net/it/media-educatione-cscuola-digitale.aspx?faculty=°ree=290&idindirizzo=&mode=cs). The "short learning programs" category includes short courses designed with/for enterprises for employee upskilling/reskilling, mainly targeting innovation in processes and technologies (https://www.uninettunouniversity.net/it/short-learning-program-re-generation-enel.aspx).
UAb	The Univesidade Aberta has its own policy and strategy for continuing education and professional development. A unit was created to support continuing education and lifelong learning, which has been in operation for more than a decade. Every year there are around 2,500 to 3,000 students enrolled in such programs. These programs are either short learning programs (1–6 ECTS) or post-graduate courses (between 30 and 60 ECTS). Subject areas range from professional skills to digital competencies or to other, less applicable knowledge.
OUNL	The Open Universiteit offers, besides Bachelor's and Master's degree programs, a substantial amount of shorter types of education which could be considered microcredentials or short learning programs. All types of education are well suited for continuing education and professional development, but are not limited to this.
KU Leuven	KU Leuven, is part of the KU Leuven Association, a dynamic network of higher education institutions in Flanders and Brussels. The network consists of 4 university colleges, 1 school of arts and 1 university (KU Leuven). One of the 10 strategic priorities in this network is "innovating lifelong learning." Several working groups are organized to realize this priority. Within the university, "lifelong learning" is also defined as an important focus for the university's policy.



KTU	The description of the procedure for the organization and implementation of non-formal education at Kaunas University of Technology is approved by the Rector.
UOC	The UOC's strategic plan for 2022–2025 is composed of 5 different tracks. The fourth, called "UOC Ecosystem", is focused on increasing competitiveness and employability. This track aims to tackle 2 different challenges: (1) increase the transformational effect of education on people's employability, on organizations' competitiveness, and on society's progress by providing continuing education that meets current and future challenges, taking advantage of new technological opportunities; (2) define the overall value proposition of the UOC in collaboration with other businesses and institutions, focusing on the ecosystem in order to catalyse knowledge and learning to boost economic and social progress.
FernUni	The FernUniversität in Hagen is Germany's only state distant learning university and "the University of Lifelong Learning." In its central strategic document, the "Hochschulentwicklungsplan 2023 [University Development Plan 2023]," the FernUniversität defines (academic) continuing education as one strategic field of action which is to be developed further: "For the FernUniversität, [continuing education] is a key component in shaping its study structure, which is geared towards lifelong learning. The FernUniversität therefore aims to intensify its activities in this regard, open up new target groups, and further develop its offerings in an active and needs-based manner. New offerings, bringing growth, are also to be created through external cooperation. To support and manage its activities, the FernUniversität has created (media-)didactic and administrative expertise for its continuing education offerings within its own structure: "the FernUniversität in Hagen Institut für wissenschaftliche Weiterbildung GmbH (FeUW) [institute for academic continuing education]." Moreover, transfer activities with business, political, cultural, and educational partners are to be further encouraged, including cooperation with regional and national professional partners.
UNED	Vice Rector for Continuing Education and University Extension offers more than 500 courses covering a variety of topics (e.g., law, industrial engineering, computer science engineering, psychology, geography, economics) with a



	variaty of langths (from 6 months to 2, 2 years) and
	variety of lengths (from 6 months to 2–3 years) and different workloads (from 2 to 120 ECTS).
OUC	The Open University of Cyprus (OUC) is currently in the process of establishing its Continuous Education and Professional Development Center. This is one of its strategic priorities for the 2021–2024 period. This center will be responsible for designing and offering professional courses and certificate programmes to make people more marketable in today's economy. OUC is also collaborating with public and private organisations in Cyprus, as well as with chambers and trade union organizations to map the needs of employers and the labour market in general and design online courses for professional development. Academic quality is paramount in developing and offering of micro-credentials, which need to have an immediate value but also – where possible – need to be stackable to allow learners to meet the requirements of a certificate and/or a degree. Micro-credentials also need to meet current and emerging market needs, and align with relevant industry standards. Being a university dedicated to distance education, promoting lifelong learning, and open access to education without exclusions, essentially OUC promotes continuing education and professional development. OUC's flexible educational methodology supports studies for working people without restrictions. Moreover, all the OUC undergraduate and postgraduate programmes of study offer their modules/courses as stand-alone units so that people interested in enrolling in one or more independent modules for professional development and lifelong learning can do so without the need to enroll in the overall programme. In this sense, all modules are considered microcredentials, since learners/participants can secure certificates following their successful attendance.
HOU	In February 2021, the "Center for Continuing Education and Lifelong Learning" (KEDIVIM) was instituted the Hellenic Open University (HOU). Its operation is part of the overall strategy and educational policy of the HOU. Through the KEDIVIM, every action of non-formal education and informal learning is implemented and certified, which includes further education, continuing education, training, and lifelong learning in general, based on the national and European institutional framework for lifelong learning. The educational-training programmes lead to the award of corresponding certificates of non-formal education, in



accordance with the applicable provisions, while they may also be implemented in cooperation with other HEIs (higher education institutions) or research centres in the national territory, as well as institutions recognized as peer institutions abroad, by decision of the Senate, following the recommendation of the Council of the KEDIVIM. In other words, CEPD is recognized as an interesting form of intervention and operation for the HOU. But it took a long time – over a decade – of difficult decision-making to achieve this recognition, as formal "complete" degrees were traditionally considered the only "legitimate" way of higher education provision, and this way of thinking was strong in the governing bodies of the HOU (not elected, but appointed by the Minister of Education).

The institutional strategies of all of the partners include corresponding terms such as "lifelong learning" and "continuing education and professional development," and almost all of them focus on "innovation in learning, educational content, and modes of delivery," "learner-centered education," "non-traditional learners," "employability," and "flexible learning pathways/modular education." The topic is also often structurally anchored in lifelong learning/continuous education units/centers or inter-institutional working groups.

The following table summarizes the findings of question (Q) 1, which is asking the partners about corresponding terms and characteristics of CEPDs within their institutional strategy.

Q1: Is ... part of your institutional strategy?

Table 2: Institutional strategies in relation to micro-credentials, characteristics and correspondent terms

"yes" for all partners	"yes" for most	"yes" for some partners
lifelong learning	innovation in learning, educational content, and modes of delivery (9)	recognition of prior learning; validation of informal/non-formal learning (3)
continuing education and professional development	learner-centered education (9)	
	non-traditional learners; inclusion/widening learning opportunities (9)	
	education partnerships; cooperation with employers/industry (9)	



transfer of the latest	
research findings into	
learning opportunities (8)	
employability (8)	
flexible learning	
pathways/modular	
education (7)	
micro-credentials/small	
learning experiences (7)	

Despite the differing contexts in which the higher education institutions act, all of them have the topic of micro-credentials on their agenda: All of the partner universities already have institutional strategies for micro-credentials or at least plan for one, even where micro-credentials are not (yet) titled as such. Seven out of ten partners state that "micro-credentials/small learning experiences" are an important part of their university strategy. In some cases, micro-credentials are quite strongly promoted as an integral part of university strategy.

The following table 3 represents the findings of question (Q) 3, which asked the partners about institutional strategies for micro-credentials at their institution.

Q3: Does your institution have a strategy for micro-credentials that is in line with the Council Recommendation?

Table 3: Institutional strategies for micro-credentials in the partnership

Partner	Strategy
Uninettuno	The term "micro-credential" is not officially used yet, while we are moving toward rebranding CPD and SLP courses as micro-credentials. Both professional qualification courses and SLPs are in fact designed and implemented according to guidelines provided by the Council recommendations, in terms of ECTS provision, duration, EQF level identification, stackability, and recognition in larger formal programs.
UAb	We have recently developed specific micro-credentials at the University aligned with the EC recommendations. There is also an internal published paper that defines what is a Micro-credential. We are currently funded by the PT



	government to train circa 6,000 students
	in microcredentials by 2026. List of
	existing micro-credentials can be viewed
	in this <u>link</u> .
OUNL	The Open Universiteit has and will further
	develop different types of micro-
	credentials as well as the embedding of
	these within the organisation and within
	the national and European higher
	education sector. Among other things,
	this will entail the development of pilots
	and the improvement of mobility, stackability and recognition by other
	institutes and employers. Part of the
	strategy is the involvement in national
	and European programs on micro-
	credentials such as MCE.
KU Leuven	KU Leuven is focusing on developing an
	institutional framework and
	implementation plan of
	micrcocredentials. At the beginning of
	2022, a project group has been set up in
	order to develop a framework for micro-
	credentials at the university. The aim is to
	have this framework ready in the
	upcoming year (2023).
KTU	KTU is a member of ECIU consortium,
	where there is a working group which is
	responsible for the micro-credential
	strategy in universities. The flexible, open and inclusive micro modules of high
	academic level are developed in
	cooperation with private enterprises
	andpublic organisations. They are
	recognised as an integral part of the
	study process (micro qualifications).
	These micro modules help the students
	of the ECIU University acquire knowledge
	and skills on the topics related to
	challenge-solving and strengthen various
	interdisciplinary competencies as well as
	give them a chance to learn other
	European languages. In the KTU Strategy
	2021-2025, University declares "We will
	update the basket of non-formal
	education programmes, adapting existing



	programmes and offering new ones to changing market needs. Not afraid to experiment and creating non-formal education projects with unusual formats, we will bring together a large group of children and adults who want to deepen and broaden their existing knowledge and skills."
UOC	The UOC Ecosystem track (see previous answer) is composed of four different action plans. The first one focuses on micro-credentials: 1. Continuing education 1. a. Periodically review the range of continuing education to improve its adaptation to the needs of companies in key sectors and institutions in each territory, and to facilitate access to training for professionals 1. b. Enhance collaborations with organizations in each territory to promote on-the-job training 2. Employment and entrepreneurship 2. a. Encourage entrepreneurial culture among students through initiatives that foster entrepreneurship 2. b. Promote career guidance for students and their entry into the workforce 2. c. Promote research and development in new methodologies relating to employment and entrepreneurship 2. d. Provide the different knowledge areas with regular updates on job market developments 2. e. Promote the exchange of knowledge with companies and institutions on the challenges of the world of work



	2. f. Design and implement an application for individual design of a career path 3. Corporate ties 3. a. Implement monitoring tools including B2B CRM 3. b. Design and implement a plan for corporate ties and ties with the UOC community, establishing shared criteria for measuring organizations' and alumni's ties (involvement and commitment) with the UOC 3. c. Produce a map of the UOC's current alliances to identify opportunities 4. Innovative ecosystem 4. a. Define, search for funding and implement the 2022–2025 transfer programme 4. b. Develop a plan to foster collaboration between agents in the entrepreneurial ecosystem and the UOC community 4. c. Develop a programme of training, outreach and dissemination actions to foster the culture of innovation in the UOC community
FernUni	The FernUniversität does not yet have an explicit institutional strategy for microcredentials. In line with national regulations on continuing education offered by universities (section 62 of the North Rhine-Westphalia Higher Education Act), the FernUniversität is, however, committed to developing new formats and business fields, particularly focusing on digitalization, new learning, and offerings for teachers. In fact, almost all major study programs already include opportunities for smaller credentials (even though they are not called microcredentials).



LINED	The institution is working on a micro
UNED	The institution is working on a microcredits program. Vice-Rector is a member of a working group of the teaching sector of the Conference of Rectors of Spanish Universities (CRUE) dedicated to microcredentials. To this end, an analysis of the existing offerings of lifelong learning programs that fit with the microcredentials philosophy is being made. Thus, we have contacted representatives of the Spanish Confederation of Business Organizations (CEOE) and trade unions to analyze the needs of the labour market that lead to the design of ad hoc microcredentials through our Social Council. At UNED we are concerned about microcredentials and in short future try to promote them as an institutional reality. The micro-credentials will be linked through the efforts of the Associated Centers with regional/national/international education and training organizations and institutions, regional/national/international employers, and regional/national/international professional organizations.
OUC	At the Open University of Cyprus there is no dedicated institutional strategy for micro-credentials yet, which is something that will be drafted as soon as the CEPD Center becomes operational.
HOU	Micro-credentials are today part of the institutional strategy of the HOU, but all actors involved admit that here many steps need to be taken until a coherent institutional policy regarding micro-credentials is established. The most intriguing issue is the possible association of micro-credentials with "complete" degrees, as well as the ways to assure and promote full academic recognition of micro-credentials, so that a clear



message is given to potential students, and to the labour market.

Most micro-credentials have been initiated less out of the self-interest of the academics/institution and are more market-oriented/demand-driven. In some cases, they respond to the formulated needs of policymakers or companies or are designed together with and explicitly for a certain employer.

All of the institutions collaborate, to a certain extent, with partners (education and training organizations, other providers, employers, professional organizations, social partners, users of micro-credentials) in the design and delivery of micro-credentials, most particularly with regional/national employers. At an international level, cooperation is frequently sought with other education providers.

3.2. Prospects: Role of micro-credentials by 2025

When it comes to the current situation and outlook regarding micro-credentials in corresponding countries and societies, most HEIs rate "wider acceptance of micro-credentials within their country/society" as rather low but are optimistic that this will change by 2025, when a higher acceptance of micro-credentials on societal/national level is expected. When asked about future perspectives, all partners agree that the role of micro-credentials in their institution will become very important/crucial/priority for their institutions by 2025. All of the partners have strategies for design and delivery of micro-credentials at their institution in accordance to the Council Recommendation.

The following table represents findings of the question (Q) 9, which asked about the prospective role of micro-credentials in the partner institutions by 2025.

Q9: What do you expect the role of micro-credentials in your institution will be by 2025?

Table 4: Anticipated role of micro-credentials by 2025 within the MCE partnership

Partner	Answer			
Uninettuno	Modularizing the didactic offerings will			
	increase the level of flexibility offered to			
	students and prospective students –			
	therefore micro-credentials will be			
	crucial. We can imagine micro-credentials			
	to be applied on several EQF levels and			
	addressing different demands:			
	- International students missing			
	credits or foundation studies in			
	order to be enrolled in a			
	Bachelor's or Master's degree			
	program will be provided with a			



- tailored catalogue of microcredentials for achieving the admission requirements.
- Degree programs will be enriched with modular pathways allowing students to integrate micro-credentials offered in the UNINETTUNO catalogue into a formal curriculum.
- "Honour programs" will be provided through specific calls for excellent students, allowing them to take part in professional courses and to interact with working professionals during their academic career, enriching their experience and adding other titles to their CVs.
- Interactions with national and international enterprises will be focused on "ad hoc" modularization/adjustments of existing courses since our current perception gathered through meetings with large enterprises is about the need for modular, focused, short programs for their employees' upskilling/reskilling.
- International projects (KA2 Erasmus) are already a part of the innovative course design strategy in UNINETTUNO, providing opportunities for designing short programs with other universities and, most importantly, with enterprises and associations in the EU bringing fresh market needs and requirements in course design. The number of short courses developed are already structured as micro-credentials, and for the next year, we can foresee a rationalization of the international catalogue with the adoption of an institutional framework already shared at



	international level through projects such as E-SLP or MCE.
UAb	At a similar stage. However, we will have a track record as part of the nationally funded projects and other European projects that will raise awareness and reputation. Publications and reports will also help to raise this awareness.
OUNL	Micro-credentials are and will be a relevant topic for our university. We expect that by 2025 we will have a substantial offering of national and some international micro-credentials with a good implementation to enable mobility, stackability and recognition.
KU Leuven	We expect to have a university-wide framework and implementation plan of micro-credentials before 2025. It is expected that Micro-credentials, and by extension continuing education will continue to be a priority for the university.
KTU	We really see micro-credentials providing access to skills-based programming led by subject-matter experts that can enable students to hone their abilities in their skill and discipline, as well as just gain more confidence and preparedness to pursue their goals. Therefore, our university invests to extend the microcredentials initiatives.
UOC	Considering that our portfolio is already based on modularity and stackability, we are now focusing our efforts on completing the transition from a fragmented approach to openloop paths and from a product-based strategy towards a service- or experience-based strategy. Apart from facilitating these open-loop paths, we are focusing our efforts on providing the best accompaniment forour students and alumni.



FernUni	The FernUniversität, with its "open
remon	university" approach, enables students to achieve individual educational goals for the purpose of lifelong learning, thanks to its modular and open study system with a variety of study formats (even below the Bachelor's degree). Therefore, it will continuously develop and establish more micro-credentials, thus ensuring even more modularity, combinability, and stackability.
OUC	At the Open University of Cyprus we do expect that micro-credentials will have an important role in our institutional growth complementary to undergraduate, postgraduate, and doctoral programmes of study. Through tie OUC's CEPD Center, we expect that the university will have dedicated funds and human resources to support the design and delivery of micro-credentials. OUC is also working on adapting procedures for recognition of prior learning and also plans to liaise with public bodies for the recognition and validation of non-formal and informal learning to safeguard the awarding of micro-credentials. OUC is also working on a new platform that will support MOOCs offerings. The offering of micro-credentials is also expected to generate new revenue for the university, and will help to attract new student populations.
HOU	All indicators show that micro-credentials will be an important part of the HOU's activities by 2025. Distance learning offered by the HOU, in combination with the increasing demand for specialised, professional, skills-oriented courses, makes it necessary for Greece's Open University to mark a turn towards micro-credentials. An investment, in terms of resources and human resources, is planned, from 2023 on, to promote the development of micro-credentials,



	although there is a strong tendency for immediate return on investment, which makes things more complicated.
UNED	By the year 2025 the micro-credentialing program at UNED is expected to have a high degree of acceptance in the country and in society, contributing to the active promotion of the design and delivery of micro-credentials at the institution at that time, as well as to the promotion of the design and delivery of micro-credentials in an active manner. Some of the micro-credentials will be taught in English. In addition, they will be interdisciplinary and will be integrated to obtain another credential and will take into account mainly the needs of the labour market and with a fundamentally professional orientation. They will be fundamentally new programs, and will be designed on the basis of a new program, mainly and to a lesser extent adapted to the needs of the labor market and with a fundamentally professional orientation. They will be based on ECTS and EQF and will also focus on responding to the needs of the target market. Also learner-centered (i.e., designed to meet the needs of the target learner group). The students will use the micro-credentials to upgrade or upgrade their qualifications to better match labor market needs and meet regulatory requirements on the job. In addition, they want to guarantee their employability and professional progression and follow them in the time necessary to probably be able to complete a full degree. Subsidy is at the level of national government from an initial capital to put
	into operation the micro-credentials. They will also be financed once these funds are exceeded starting in 2026 through student tuition and other



	sources of funding through private and public companies.

3.3. Funding policies

A crucial part of any ongoing project is its financing, which in turn impacts institutional strategies. That is why, in the third part of the survey, the partners were interviewed about the funding of their continuing education offerings in general and micro-credentials in particular. Very few of the partners have developed a dedicated business model for micro-credentials.

University-based continuing education and professional development (CEPD) in general is often not publicly funded (6/10), with the exception of some specific "post-COVID-19" funding, public calls, etc. Likewise, micro-credentials are rarely publicly funded. The primary source of financing the micro-credentials offered is clearly student/learners/participants fees (6/9).

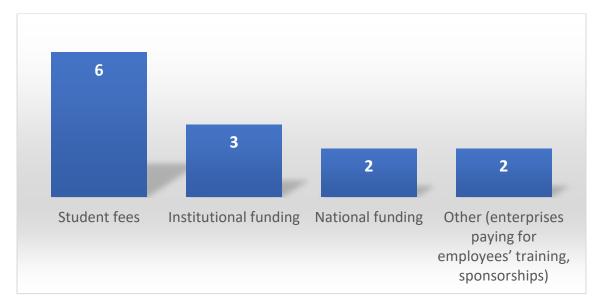


Figure 1: Primary sources of financing

Student fees differ enormously from institution to institution and from offering to offering: The range starts with micro-credentials offered completely free of charge and goes up to 9,000 euros per micro-credential. Likewise, the amount paid per ECTS credit for micro-credentials ranges from 70 to 400 euros. In relation to the respective cost of living, almost all of the partners estimate that at least 50% of the population in their country can afford micro-credentials; for 3/8 of the partners, this figure is at least 80%.

3.4. Characteristics and understanding of micro-credentials

The findings of the parts of the survey dedicated to denominations and characteristics of short learning programs and micro-credentials – presented in Weiß, Zeman, Elsholz,



Hutgens, Antonaci (2023): "Analyzing and mapping of current institutional qualifications for continuing education and professional development" — clearly show how differently each institution defines and understands short learning opportunities. Although the above mentioned report (Weiß et al. 2023) offers a detailed analysis on the topic, a short summary is presented here to complement the findings of this paper.

Almost all of the micro-credentials offered at the partner institutions are (according to the EC Recommendation) ECTS- and EQF-based (7/10); many are also learner-centered (5/10). Another similarity is that very few are interdisciplinary in nature and that English-language offerings are the exception.

Half of the partners primarily offer micro-credentials with an academic orientation, while the other half focuses on labor-market/vocational learning outcomes. Half of the partners offer micro-credentials that result from the modularization of existing programs or courses. Four partners do so with many or all of their micro-credentials. At one partner university, all micro-credentials are explicitly set up from scratch.

All the above-mentioned findings (see Weiß et al. 2023) refer to all the courses or programs that the institutions understand as being a micro-credential according to the definition in the EC Recommendation. That does not necessarily mean that these offerings are titled as such.

Six out of nine partners already use the term "micro-credential." However, what is meant by that varies greatly from institution to institution. The most significant variation is the range of ECTS credits from 1 to 30, or 26 to 700 hours of study. The academic level of study lies mostly at EQF 6 or 7 (i.e., Bachelor's or Master's), sometimes also at 5 or 8 (preparatory or doctoral level). Half of the partners report that the micro-credentials offered are (mostly) stackable; one university offers only standalone courses. Half of the partners issue a diploma supplement for students who have successfully completed their micro-credential. In addition to the term "micro-credential," a variety of other designations are used: "short learning program" (7), "certificate" (7), "professional course" (6), and "diploma" (2) are the most widespread, along with seven other denominations, e.g., "continuing education with certificate of attendance," "MOOC," and "open teaching." However, all these terms in turn are understood quite differently with regard to the number of ECTS credits, number of study hours, EQF level, diploma supplement, stackability, etc. (Weiß et al. 2023).

Considering the variations regarding denominations and diverse characteristics, a suitable approach, for the time being, seems to be to value the umbrella of opportunities for individual institutions and countries that comes with micro-credentials. The "European approach to micro-credentials for lifelong learning and employability" presents a wide definition of micro-credentials; each institution is responsible for taking this definition and making it meaningful and operational by connecting it to the unique characteristics of their population, countries, institutions, and national law.



3.5. Learners from an institutional perspective

To date, there is not much data on micro-credential learners' perspective and what motivates them to sign up for a micro-credential. The institutional perspective gained from the survey could only give good guesses based on universities' currents experiences in offering micro-credentials. The findings from the MCE project work package 2, namely the results of the questionnaire and focus groups being carried out by the partner Universitat Oberta de Catalunya (UOC), which have already substantially contributed to the field by meta-research on the learners' perspective (Bruguera et al. 2022), will deliver a reliable evidence base in this regard. Nonetheless, the survey conducted by the FernUni in Hagen could capture the institutional perspective on possible drivers (motivations) of students engaging in micro-credentials (Weiß et al. 2023). Most of the partners maintain that the majority of their micro-credential students are lifelong learners. Five out of ten partners state that most learners already have a Bachelor's degree when enrolling; seven out of ten indicate that some students already have a Master's degree before they delve into a micro-credential. Five out of nine partners assume that micro-credential learners are likely to study again at their institution. In contrast to the expressed EC expectation, few micro-credential learners are believed to belong to disadvantaged and vulnerable groups.

As regards the assumed motivations of learners, the answers are also relatively consistent. The main motivations – in line with the EC Recommendation – are expected to be the "wish to ensure employability and career progression" and to "use the microcredential for up- or reskilling to better fit labor market needs." Likewise, the intrinsic motivation (students wishing "to learn for their own personal development") has a high score (Weiß et al. 2023).

3.6. Quality policies

The European Commission highlights the importance of quality as a primary principle for the design and issuance of micro-credentials (annex 2 of EC 2021b). It is agreed upon by all stakeholders that a wider acceptance of micro-credentials is not possible without a clear and transparent underlying quality assurance system. A section in the survey was therefore dedicated to quality policies concerning micro-credentials. In this sense, the finding that all partners have (more or less well-defined) plans for improving quality assurance can be read as revealing.

At most institutions, micro-credentials are evaluated only internally (6/10). However, the internal quality assurance processes are generally based on or are comparable to the external ones for Bachelor's/Master's programs, thus ensuring a certain degree of consistency. The exception to this rule are micro-credentials that form part of Bachelor's or Master's programs: these are evaluated externally. At eight out of nine institutions, learners are involved in quality assurance processes, mostly via surveys after the course.

When asked about quality assurance in practice, the partners' answers are quite consistent. At all of the institutions surveyed, the professors and other academic staff develop and teach the micro-credentials offered; only one university also offers



additional teaching by external teachers. All of the partners regularly update their course material. Assessments for micro-credentials are usually supervised using a form of identity verification, regardless of whether they take place online (9/10) or on-site (7/10). Assessments without any identity verification (supervised or unsupervised) are rather the exception.

Obtaining micro-credentials is usually possible following an assessment of the learning outcomes obtained through a specific course leading to a micro-credential (9/10). In contrast, the recognition of prior learning and assessments of learning outcomes resulting from non-formal and informal learning are much less widespread. Digital credentials such as Europass are not (yet) being used, and only one institution certifies its offerings digitally only.

Seven out of ten institutions recognize micro-credentials issued by other higher education institutions based on standard recognition procedures. At three of these, this is contingent on certain conditions (e.g., a clear indication of the EQF level and the number of ECTS credits, or an inter-institutional agreement).

3.7. Differing national contexts

The existence of very different framework conditions for micro-credentials in the individual countries across Europe was one striking revelation of the survey results. Although micro-credentials and smaller educational programs are explicitly supported by the relevant ministries in some countries, in others, the fear that these may undermine full programs is dominant in the higher education policy debate. Micro-credentials are only rarely financed by the national government (positive examples: UAb, UNED).

Another framework condition that differs enormously between countries but affects the approach to the topic to a great extent is that of legal requirements. For instance, one country has strict legal requirements for university-based continuing education programs. In other partner countries, universities are relatively unrestricted when it comes to the design and issuance of micro-credentials.

The general acceptance of micro-credentials within the respective countries as well as in societies is rated low everywhere, even though all of the partners expect that the awareness and acceptance will increase massively within the next few years.

4. Conclusion

The results of the survey clearly show that all participating European institutions are strategically dealing with the issue of short, flexible, tailored learning opportunities (some of them already for several years), and have elaborate strategies for their development and implementation. It is evident that all have different approaches, at both the institutional and national level, with institutional policies reflecting the national approach. Even though there are some commonalities, as described above, the differences are very striking.



In its adoption of the Council's recommendation, the EU states that the newly examined text "now meets with the agreement of all delegations" (EC 2022a, p. 1). If it is the case that all European delegations agree on the recommendation, having the support of their national ministries would be one — if not the central — building block for all those institutions offering or planning to offer micro-credentials. It would also help to overcome another challenging issue: awareness and acceptance, which seems to be low in all the surveyed countries. In some countries, the idea of micro-credentials seems to be very welcome, and universities are supported and encouraged to develop new offerings. In other countries, there is a clear hesitation at the political level. While the EU highlights a number of benefits in relation to micro-credentials, many risks are discussed at national level in some states. In order to make micro-credentials a European success story and to cover the needs of "learners, workers and job-seekers seeking to upskill and reskill, [...] [who] wish to ensure their employability and career progression" (EC 2021b, p. 1), member states need to find a consensus on the benefits of micro-credentials and communicate them as such.

References

Bruguera, C., Fitó, A., Pagés, C., & Antonaci, A. (2022). Meta-research on the learner perspective on micro-credential formats and learning services for continuing education and professional development (Issue 2.1). https://doi.org/10.5281/zenodo.7356761

Diez Arcon, P., Vázquez Cano, E, Henderikx, P., Ubachs, G., & Antonaci, A. (2021). *Policy recommendations at institutional, government and European level* (Research Report No. 09.2). Retrieved from European Short Learning Programmes Project website: https://e-slp.eadtu.eu/images/deliverable9second.pdf

EC (2020). A European approach to micro-credentials – Output of the micro-credentials higher education consultation group - Final report, https://education.ec.europa.eu/education-levels/higher-education/micro-credentials

EC (2021a). Council Resolution on a strategic framework for European cooperation in education and training towards the European Education Area and beyond (2021–2030). OJ C, C 66/01, p. 1–21. (https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32021G0226(01))

EC (2021b). Proposal for a COUNCIL RECOMMENDATION on a European approach to micro-credentials for lifelong learning and employability. https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52021DC0770&from=EN

EC (2021c). Roadmap. https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=PI COM:Ares(2021)1375553&rid=2

EC (2021d). Proposal for a COUNCIL RECOMMENDATION on individual learning accounts, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52021DC0773



EC (2022a). Proposal for a Council Recommendation on a European approach to microcredentials for lifelong learning and employability – Adoption. https://data.consilium.europa.eu/doc/document/ST-9237-2022-INIT/en/pdf

EC (2022b). Council recommends European approach to micro-credentials. Press release. 16 June 2022. Council of the EU.

https://www.consilium.europa.eu/en/press/press-releases/2022/06/16/council-recommends-european-approach-to-micro-credentials/

EC (2022c). A European approach to micro-credentials. https://education.ec.europa.eu/education-levels/higher-education/micro-credentialsE-SLP (2020). About - E-SLP. https://e-slp.eadtu.eu/

European University Association: Europe's Universities 2030, https://eua.eu/101-projects/784-europe%E2%80%99s-universities-2030.html

MCE (2022). MCE-Project. Homepage, https://mce.eadtu.eu/index.php

Thaler, I., Bastiaens, T., Elsholz, U.: WP 3 Report on Institutional Strategies, E-E-SLP Project, April 2019 (unpublished paper).

Weiß, M., Zeman, M., Elsholz, U., Hutgens, R., Antonaci, A. (2023). Analyzing and mapping of current institutional qualifications for continuing education and professional development and micro-credentials in the MCE partnership, Zenodo. https://doi.org/10.5281/zenodo.7844891

Annex: WP3 Questionnaire

MCE WP3: Questionnaire

The deadline is 30.06.2022. Please ensure that all questions are answered to date. You are able to save your answers before submitting the whole questionnaire. Thank you for your collaboration!

In completing **D3.1 – Institutional development** it will be performed a "comparison of institutional policies, strategies and frameworks for CEPD in the partnership, taking into account learner aspirations and preferences (WP2) and responding to the EC Recommendation on microcredentials (the EEA, 2020). It will also include descriptions of structures for CEPD integrating learner services and the management with external stakeholders. It will involve future-proof perspectives regarding the Transformation of Higher Education and the Future of the European University 2030. The comparison will



also build on earlier reports (e.g., the E-SLP project, 2019)" (Erasmus+ Programme Application Form, Part B, p. 44).

D3.2 is about "Analyzing and mapping current institutional qualifications for continuing education and professional development and microcredentials in the partnership, according to a descriptive template based on criteria related to learner aspirations and preferences and to reports of the Microcredentials in Higher Education Consultation Group (2021) and the Microbol project (2021) regarding volume, EQF level, assessment, quality standards, recognition of prior learning, etc." (Ibid., p. 45).

Please refer to **blended/digital** micro-credentials at your institution and use the **EC definition of micro-credentials**:

"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. (EC 2021b, p. 14)

For further background, definitions, and context, please refer to the Proposal for a Council Recommendation, accessible here, for example: https://mce.eadtu.eu/index.php/news.

Part I: Institutional strategy and frameworks

Please provide relevant passages of strategic documents in English.

- 1. Is ... part of your institutional strategy? Rate 1–3: no/to some extent/yes.
 - lifelong learning, employability, continuing education and professional development, flexible learning pathways/modular education, microcredentials/small learning experiences, innovation in learning/educational content and modes of delivery, learner-centered education, non-traditional learners, inclusion/widening learning opportunities, recognition of prior learning/validation of informal/nonformal learning, transfer of the latest research findings into learning opportunities, education partnerships/cooperation with employers/industry
- 2. What is the policy and strategy, in your organization, in relation to continuing education and professional development (CEPD) in general, and MCs in particular? *Please describe*.
- 3. In line with the Council Recommendation, is there an institutional strategy for micro-credentials? *If yes, please describe.*
- 4. Micro-credentials at your institution ... (Rate 1–4: all/most/some/none)



- i. are interdisciplinary.
- ii. are offered in English (rather than in local language).
- iii. are integrated/stackable towards other credentials (not standalone/independent).
- iv. are market-oriented/demand-driven (rather than serving own strategy/staff interest).
- v. have an academic orientation (rather than professional focus).
- vi. originate from modularization of an existing program/course (rather than being newly designed as micro-credentials).
- vii. are ECTS- and EQF-based.
- viii. are learner-centered (i.e., designed to meet the needs of the target group of learners).
- 5. Students of micro-credentials at your institution ... (Rate 1–4: all/most/some/none.)
 - i. are lifelong learners.
 - ii. wish to orient themselves as regards studying.
 - iii. use the micro-credential as preparation for a specific study program.
 - iv. use the micro-credential for up- or reskilling to better fit labor market needs.
 - v. wish to ensure their employability and career progression.
 - vi. use the micro-credential to meet regulatory requirements in their job (such as mandatory training).
 - vii. wish to learn for their own personal development.
 - viii. do not have the money for a whole degree program.
 - ix. do not have the time for a whole degree program.
 - x. have the same legal status as students enrolled in Bachelor's/Master's programs.
 - xi. already have a Bachelor's degree when enrolling.
 - xii. already have a Master's degree when enrolling.
 - xiii. belong to disadvantaged and vulnerable groups (people with disabilities, the elderly, low-qualified/-skilled people, people with migrant background, refugees/asylum seekers, people with fewer opportunities because of their geographical location and/or their socio-economically disadvantaged situation).
 - xiv. are likely to study again at your institution.
- 6. Does your institution collaborate with ... (or plans to do so) concerning the design and issuance of micro-credentials? (You can select multiple options)
 - i. education and training organizations on a regional/national level
 - ii. other providers on a regional/national level
 - iii. employers on a regional/national level
 - iv. professional organizations on a regional/national level
 - v. social partners on a regional/national level
 - vi. users of micro-credentials on a regional/national level
 - vii. education and training organizations on an international level
 - viii. other providers on an international level
 - ix. employers on an international level



- x. professional organizations on an international level
- xi. social partners on an international level
- xii. users of micro-credentials on an international level
- 7. Qualification structure for micro-credentials at your institution:

Name of the offering	Award given	Integration/stackability options	Volume of learning (hours of study)	ECTS	EQF/NQF level	Diploma suppleme nt provided
micro-degree, micro- credential, nano-degree, certificate, diploma, short learning program, professional course, other (please specify)	certificate, ECTS, badges, other (please specify)	standalone/independen t micro-credential, or integrated/ stackable towards other credentials) – if stackable, up to (number of) ECTS		1–59	EQF 4/5: foundation, 6: Bachelor's, 7: Master's, 8: doctoral level	yes/no

- 8. Current situation and outlook:
 - i. How high would you rate the wider acceptance of micro-credentials in your country/society now? *Rate 1 (low)*–5 (high).
 - ii. How high do you believe the wider acceptance of micro-credentials in your country/society by 2025? *Rate 1 (low)–5 (high).*
 - iii. How high will be the active encouragement concerning the design and delivery of micro-credentials at your institution now? Rate 1 (low)-5 (high).
 - iv. How high do you believe the active encouragement concerning the design and delivery of micro-credentials at your institution will be by 2025? *Rate 1 (low)*–5 (high).
 - v. What do you expect the role of micro-credentials will be in your institution by 2025?
- 9. Further comments on institutional strategy and frameworks:

Part II: Quality policies

- 1. Micro-credentials at your institution are usually designed by ... professors, academic staff with permanent contract, academic staff without permanent contract, other. (You can select multiple options)
- 2. Micro-credentials at your institution are usually taught by ... professors, academic staff with permanent contract, academic staff without permanent contract, other. (You can select multiple options)
- 3. Micro-credentials at your institution are subject to quality assurance: *internal, external assessment of institution, external assessment of individual learning*



- unit/course/program, no specific quality assurance.
- 4. Institutional quality assurance for micro-credentials differs from quality assurance processes for Bachelor's/Master's degrees. *Yes/no if yes, please specify*.
- 5. Do you involve learners in quality assurance processes for micro-credentials? *If yes, please describe.*
- 6. Course material is regularly updated. Yes/no.
- 7. Obtaining micro-credentials at your institution is possible following the assessment of learning outcomes ... obtained through a specific course leading to a micro-credential, resulting from non-formal and informal learning, resulting from the recognition of prior learning. (You can select multiple options)
- Does your institution use digital credentials (such as Europass:
 https://europa.eu/europass/en/european-digital-credentials-learning)? Yes/no.

 Comment: Micro-credentials issued should be portable, i.e., "may be stored and shared easily by the credential-holder, including through secure digital wallets (e.g. Europass)." (EC 2022b)
- 9. Are there plans for the future concerning the improvement of micro-credential quality at your institution?
- 10. Micro-credentials issued by other higher education institutions are/will be recognized by your institution based on standard recognition procedures. *Yes/no, under certain conditions.*
- 11. Further comments on quality policies for micro-credentials:
- 12. Assessments in micro-credentials at your institution are ... unsupervised with no identity verification, supervised with no identity verification, supervised online with identity verification, supervised on-site with identity verification.

Part III: Funding policies

- 1. Is continuing education and professional development (CEPD) publicly funded in your country/region? *Yes/no. If yes, please describe.*
- 2. Are micro-credentials in particular publicly funded in your country/region? *Yes/no. If yes, please describe.*
- 3. Do you fund micro-credentials mainly through ... student fees, national funding, institutional funding, other?
- 4. Fees for a micro-credential at your institution amount to (in €):
- 5. Micro-credentials are affordable to ca. 100/80/50/20% of the population.
- 6. Is there a business model for micro-credentials at your institution? Yes/no. If yes, please describe.
- 7. Further comments on funding policies for micro-credentials:



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