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Reports, recommendations and position papers to the EU and the national governments concerning micro-credentials based on evidence resulting from the MCE project and continuous dialogues with policymakers and stakeholders.



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Executive Summary

This deliverable aims to discuss and present reflections from the MCE project about the state of policy for Micro-credentials, based on existing published documentation and the initial deliverables of the project. Specifically, it is based on reports covering (i) a meta-research on the learner perspective on micro-credential formats and learning services for continuing education and professional development; (ii) learner preferences and expectations regarding micro-credentials; (iii) institutional approaches to micro-credentials; and (iv) existing micro-credential pilots. This deliverable is guided by the outputs of the MCE project, and examines, particularly, the EU Council Recommendations for the European approach to micro-credentials for lifelong learning and employability (Council Recommendation of 16 June 2022 on a European Approach to Micro-Credentials for Lifelong Learning and Employability, 2022), as well as the relevant actions outlined in the European Skills Agenda. This position paper will also reflect on the challenges that may arise in implementing the European principles for designing and issuing micro-credentials (which are part of the Council's recommendation), both at a national and European level.

In the report, we analyse each principle in detail and will provide a series of recommendations to inform leaders of Higher Education (HE) institutions and national and European policymakers on micro-credentials. Furthermore it dwells on the impact of micro-credentials within HE. It will not address challenges and recommendations for further education or the labour market as producers of micro-credentials, although some references will inevitably be relevant for policymakers in these sectors.

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1. Introduction

Micro-credentials are a form of learning recognition that has gained popularity in recent years, initially in North America and Australia and more recently in Europe. Micro-credentials are designed around a format short, stackable, and focused learning blocks that lead learners to the acknowledgment of a certification/recognition of a specific skill or competency, mainly digitally. The EU Council recommendations mention that a ‘micro-credential’ is a:

“... record of the learning outcomes that a learner has acquired following a small volume of learning. These learning outcomes will have been assessed against transparent and clearly defined criteria. Learning experiences leading to micro-credentials are designed to provide the learner with specific knowledge, skills and competences that respond to societal, personal, cultural or labour market needs. Micro-credentials are owned by the learner, can be shared and are portable. They may be stand-alone or combined into larger credentials. They are underpinned by quality assurance following agreed standards in the relevant sector or area of activity” (Council Recommendation of 16 June 2022 on a European Approach to Micro-Credentials for Lifelong Learning and Employability, 2022).

The Council’s definition of micro-credentials encompasses a broad and complex set of concepts that remain only partially understood by the higher education sector, learners, and employers. In higher education, for example, learning outcomes are rarely provided in isolation. Instead, modules or programs of study are typically structured around a combination of learning outcomes that learners must achieve to earn a degree or complete a module or unit. By emphasising specific skill sets or individual learning outcomes, the Council is encouraging HE institutions to innovate, explore new markets, and develop new offerings and partnerships. Moreover, these skill sets must be designed to meet societal, personal, cultural, and labour market needs, reinforcing the importance of lifelong learning, while catering to a diverse learner population. These lifelong learners are primarily focused on reskilling or upskilling to advance their careers or transition into new roles, viewing micro-credentials as a fast and targeted learning opportunity. Employers, on the other hand, see

micro-credentials as a way to develop their workforce as they are generally unwilling to invest significant time in employee training which is the case for more traditional degrees.

When publishing its European Skills Agenda (European Skills Agenda for Sustainable Competitiveness, Social Fairness and Resilience, 2020), the European Commission set out policy priorities and actions aimed at increasing the employability of citizens and boosting the skills for the workplace. Action 10 of this report, published in 2020, set the ground for the focus given by the Commission to micro-credentials. According to the Commission, micro-credentials should (i) encourage the uptake of flexible and quality-assured courses, make learning more visible and understood, (iii) be validated and guided, and (iv) be easy to store and communicate through Europass. The example given is revealing to what the Commission sets as a reference for a micro-credential:

Ivana is an experienced supermarket stock manager. A new software is opening up possibilities for less waste – if she and her staff can master its use. By following a short, targeted training module provided by her industry federation, she will be awarded a micro-credential as proof of her new skills – ready to put to use with her current or future employer

(European Skills Agenda for Sustainable Competitiveness, Social Fairness and Resilience, 2020)

This shows the possibility of an “industry federation” offering a training module to develop the necessary skills for using a specific new software. This implies that a member of the industry sector will be able to design, develop, deliver, assess, and recognise a specific “volume of learning”. However, the Commission provides little detail on the quality assurance of these micro-credentials, their portability across different sectors or industries and/or the transparency of the data associated with these MCs. This approach is contrary to what happens in HE, where institutions (and programmes) are evaluated, directly or indirectly, by quality assurance agencies based on established criteria. HE institutions operate within a framework that promotes and ensures transferability and transparency of information through a ‘common’ terminology (ECTS; the European Qualifications Framework and the EUROPASS), and there are mechanisms of assuring that trainers and teachers are scientifically and pedagogically able to be designing, developing, delivering, and assessing learning

outcomes and learning. In the industry or services sectors, those principles are not guaranteed.

At the same time, concerns may be raised by the industry or service sectors that HE is frequently disconnected from the labour market skills gap and struggles to respond quickly to evolving and urgent skills demands. Critics also argue that HE has limited real-world experience and often produces graduates who are unprepared for the demands of an increasingly complex society and labour market. Likewise, academia and its structures—such as quality assurance mechanisms—are not agile enough to develop short, practical courses that effectively respond to employers' needs.

The Commission firmly asserts that micro-credentials will play a crucial role in achieving the goal of having 60% of all adults engaged in training each year by 2030 and attaining an employment rate of at least 78%. Several communications from the EU address the topic of micro-credentials, some of those are highlighted below:

- The Commission Communication on “Achieving the European Education Area by 2025” announced that it will work to develop a European approach to micro-credentials, seeking to widen learning opportunities and strengthen the role played in lifelong learning by both higher education and VET institutions (European Commission, 2017).
- In its conclusions on the “European Universities Initiative – Bridging higher education, research, innovation and society: Paving the way for a new dimension in European higher education” (European Council, 2021), the European Council stresses that notwithstanding the value of traditional degree programmes, micro-credentials could help widen learning opportunities to accommodate non-traditional learners and the demand for new skills in the labour market. The Council goes further and adds that micro-credentials may make the learning experience more flexible and modular and engage learners, regardless of their previous qualifications or backgrounds, widening, therefore, the access to higher education.
- The Ministers for Higher Education of the European Higher Education Area (2020) committed, in the Rome Communiqué of the inter-governmental Bologna Process, to help the higher education sector to (i) diversify their learning offer and (ii) innovate

in educational content and modes of delivery. The Ministers added that under the Bologna Process, cooperation will explore how these smaller, flexible units of learning can be defined, developed, implemented, and recognised by using common tools.

- The European Commission's "Union of Skills" Communication, released on 5 March 2025, outlines a strategic vision for strengthening education, training, and lifelong learning in the European Union (European Commission, 2025). This initiative aims to address skills shortages, promote workforce adaptability, and enhance Europe's competitiveness in a rapidly evolving global economy. A key component of this strategy is the promotion and development of micro-credentials, which are seen as a crucial tool for fostering flexibility in learning and ensuring that individuals acquire relevant skills for the labour market.

The "Union of Skills" Communication marks a significant step towards the widespread adoption of micro-credentials in the EU. By establishing a standardised and recognised system, integrating them into formal education structures, and aligning them with labour market demands, the EU is positioning micro-credentials as a key instrument for workforce development. This approach not only enhances employability but also ensures that European citizens have the skills necessary to navigate a rapidly changing world of work. The alignment with broader EU policies further reinforces the role of micro-credentials in building a more adaptable, skilled, and competitive European workforce.

The Council Recommendation also refers to another Recommendation from 2012 (Council Recommendation of 20 December 2012 on the Validation of Non-Formal and Informal Learning, 2012) that invited member states to put into place arrangements for validating non-formal and informal learning.

The Council, in its Recommendation for the adoption of micro-credentials sets, has listed as key objectives, the following:

- enable individuals to acquire, update and improve the knowledge, skills and competencies they need to thrive in an evolving labour market and society, to benefit fully from a socially fair recovery and just transitions to the green and digital economy and to be better equipped to deal with current and future challenges.
- support the preparedness of micro-credential providers to enhance the quality, transparency and flexibility of their learning offer to empower individuals to forge personalised learning and career pathways.
- foster inclusiveness, access and equal opportunities, and contribute to the achievement of resilience, social fairness and prosperity for all, in a context of demographic change and throughout all phases of economic cycles.

The Recommendation stated that the relevance of micro-credentials depends on the cooperation and collaboration of regional and national authorities and institutions responsible for education and training and sectoral and cross-industry social dialogue.

Finally, the Recommendation aims at establishing a common European approach to the ongoing and emerging provision of micro-credentials; however, it may be questioned whether a definition and guidance for the design, issuance, and description of micro-credentials to improve their quality and transparency and facilitate their uptake are provided throughout the document as promised.

This position paper discusses some of the aims of the Council, highlighting some of the challenges that micro-credentials may face in light of the recent recommendations. Particular attention is given to the European principles for the design and issuance of micro-credentials, which as argued, are complex and in need of further discussion based on evidence from practice. This paper also examines the MCE consortium's initial reports, which include practices of designing, developing, implementing, and evaluating micro-credentials in 10 higher education institutions representing 9 EU member countries.

A summary of key findings is presented, drawing from a) the learner perspectives based on the literature review and empirical findings, b) findings of a survey conducted with the leadership of 10 different Higher Education Institutions that are partners of the MCE project about their strategic vision for micro-credentials, and c) a comparative analysis of existing national policies for micro-credentials and lifelong learning in the 9 countries and regions represented in the MCE consortium.

2. MCE Report on the Analyses of National and European Policies on Continuing Education and Professional Development Related to Micro-Credentials

The MCE Report on the Analyses of National and European Policies on Continuing Education and Professional Development Related to Micro-Credentials (Casanova et al., 2024) provides a comprehensive analysis of the policy landscape surrounding micro-credentials within European higher education. Produced as part of the MCE project, this report explores both national and EU-level approaches to micro-credentials, emphasising their potential to foster lifelong learning and enhance employability across diverse sectors.

The study reveals that while micro-credentials are increasingly recognised as essential tools for upskilling and reskilling in response to evolving labour market demands, their implementation across Europe remains uneven. Despite the EU recommendation for a unified approach, member states have maintained autonomy, resulting in a fragmented landscape. Some countries, such as Spain and Portugal, have made notable progress in integrating micro-credentials into their education and training systems. Spain's "Plan Microcreds" provides substantial financial support and a structured framework for implementation, while Portugal's "Adult Impulse Initiative" (Caetano et al., 2023) aims to modernise continuing education through higher education-employer partnerships, though its micro-credential strategy remains less defined (Casanova et al., 2024).

Conversely, many EU member states have yet to establish dedicated policies or frameworks for micro-credentials, often incorporating them within broader lifelong learning strategies. In countries like Germany and the Netherlands, the absence of targeted legislation has led to fragmented practices, with institutions developing internal quality assurance measures without national oversight. This lack of standardisation complicates the recognition and portability of micro-credentials across borders, a key objective of the European Council's recommendations.

The report highlights the role of quality assurance agencies in shaping the micro-credential landscape. While the European Higher Education Area (EHEA) standards provide a foundation, quality assurance systems for micro-credentials remain underdeveloped (Hidalgo & Jiménez, 2023). Spain and Lithuania have begun incorporating micro-credentials into their national quality assurance frameworks, but external quality assurance remains limited across much of Europe. This inconsistent approach raises concerns about the credibility and acceptance of micro-credentials by both employers and educational institutions.

Another key challenge identified is the lack of centralised portals or repositories for micro-credentials in most EU countries. Despite EU encouragement to develop transparent

recognition systems, few nations have implemented national platforms. Notable exceptions include Ireland, Finland, and Germany, which have established portals offering comprehensive information on micro-credential programmes. These platforms serve as models for enhancing accessibility and cross-border comparability.

Despite these challenges, momentum for micro-credential adoption is growing, with several countries launching pilot programmes and funding mechanisms to expand their use. However, the absence of a universally accepted definition, along with variations in design, duration, and level, continues to hinder efforts towards a cohesive European framework. This inconsistency poses a significant barrier to cross-national recognition and the broader integration of micro-credentials into traditional education systems and the labour market.

As a consequence the the need for ongoing dialogue between policymakers, higher education institutions, and employers is crucial to ensure that micro-credentials fulfil their promise as flexible, accessible tools for professional development in an increasingly digital and rapidly evolving economy (Casanova et al., 2024).

3. Quality Assurance in Micro-Credentials: Ensuring Quality and Consistency in Higher Education

Micro-credentials have emerged as a transformative element in the higher education landscape, offering flexible, targeted learning outcomes that complement traditional degree programs. As these short, focused educational offerings become increasingly popular for upskilling and reskilling, ensuring their quality has become a critical concern for education providers, accreditation bodies, and policymakers. The MICROBOL project (Cirlan & Loukkola, 2020) and the ENQA report on micro-credentials (Greere, 2023) provide valuable insights into the current state of quality assurance mechanisms, outlining both internal and external challenges while offering recommendations for harmonisation and improvement across Europe.

3.1. Internal Quality Assurance and the Role of ESG

At the heart of quality assurance for micro-credentials is the principle that they should not be seen as isolated learning units but rather as integral components of the broader HE framework. The MICROBOL project emphasised that micro-credentials should adhere to internal quality assurance measures grounded in the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG) (Cirlan & Loukkola, 2020). This means that educational institutions must integrate micro-credentials into their established internal quality monitoring systems. The underlying premise is that, regardless of their format or stage in the education process, micro-credentials must reflect the rigorous academic and

administrative standards expected in HE. By aligning with ESG principles, institutions are encouraged to apply the same transparent and robust quality assurance frameworks to micro-credentials as they do for traditional degree programs. This includes a thorough evaluation of course content, assessment practices, and continuous improvement mechanisms based on feedback from learners and peers. In practice, providers are tasked with not only ensuring the quality of the micro-credential itself but also the integrity of the entire learning experience that supports its delivery.

3.2. External Quality Assurance: Current Practices and Survey Findings

External quality assurance plays a complementary role to internal quality assurance systems. The ENQA report highlights that external quality assurance agencies are increasingly being called upon to review and validate the quality assurance processes that underpin micro-credentials. However, survey findings indicate a significant variation in practice and a degree of uncertainty among quality assurance agencies regarding the best methodological approaches to externally assess these learning units (Hidalgo & Jiménez, 2023).

According to the survey conducted among 64 respondents from 53 quality assurance agencies at the European level, only a small fraction (approximately 15.6%) currently employ external quality assurance processes to micro-credentials, with an additional 12.5% in the process of developing dedicated approaches (Hidalgo & Jiménez, 2023). More than half of the respondents (54.7%) rely on the internal quality assurance systems of HE institutions, either fully or partially. In contrast, nearly 44% of quality assurance agencies reported that they do not validate or review the recognition of micro-credentials offered by various providers. Moreover, around 21.9% of the agencies are not engaged in any recognition activities at all.

These figures suggest that while there is a growing awareness of the need to extend quality assurance practices to micro-credentials, quality assurance agencies have yet to fully define and implement consistent mechanisms. The moderate expectations expressed about the relevance of the ESG in this context further underscore the need for tailored external quality assurance methodologies that can address the specificities of micro-credentialing.

3.3. National and Regional Approaches: A Patchwork of Practices

A closer look at national and regional practices across Europe reveals a diverse landscape in the quality assurance of micro-credentials. In some countries, such as Cyprus, Greece and Italy, external accreditation for micro-credentials is currently non-existent. In the Netherlands, the accreditation focus remains on entire programs rather than individual learning units, although a proposed law under the Dutch Qualification Framework (NLQF) aims to facilitate the evaluation and classification of micro-credentials. Similarly, in Flanders, while external quality assurance exists for open courses incorporated within Bachelor's or

Master's programs, there is still an ongoing discussion regarding micro-credentials offered independently of these traditional pathways (Casanova et al., 2024).

In countries like Portugal and Spain, quality assurance agencies play an active role in monitoring the internal quality assurance processes of micro-credential providers. These national agencies are encouraged to critically evaluate the robustness of institutional systems and to ensure that internal measures adequately address the specific demands of micro-credential quality.

The ENQA report further presents varied external QA approaches through the experiences of Spain (Catalunya), Estonia, Ireland, and the United Kingdom (Greere, 2023). For example, AQU Catalunya has developed an accreditation methodology for short learning programs targeting regional job market needs, while Estonia's HAKA has piloted quality assessments for non-formal education institutions, ensuring that only those with demonstrated competence can offer micro-credentials. In Ireland, Quality Qualifications Ireland (QQI) rapidly adapted its evaluation methods during the pandemic by integrating modules from previously validated programs into a structured quality assurance framework—a practice that has now become standard.

3.4. Challenges and Future Directions

The external quality assurance of micro-credentials faces several challenges that extend beyond the remit of quality assurance agencies. One of the most significant obstacles is the lack of a universally accepted definition of what constitutes a micro-credential. This definitional ambiguity creates inconsistencies in how quality assurance criteria are applied, complicating the evaluation process across different countries and educational contexts. Without clear descriptors and frameworks, establishing a common set of standards becomes a formidable challenge. In addition to definitional challenges, many countries grapple with gaps in national legislation that impede effective regulation of micro-credentials. The absence of supportive legal frameworks means that quality assurance bodies often have to operate within loosely defined parameters, which can lead to disparities in the recognition and transferability of micro-credentials across national borders. This fragmentation not only affects the education sector but also poses challenges for employers and learners who rely on micro-credentials as evidence of skill and competence.

To address these challenges, several recommendations have emerged. Firstly, there is a need for a more coordinated European approach that builds on the Bologna instruments to enhance transparency and trust. Such an approach would encourage European cooperation, enabling countries to share best practices and develop common standards that bridge national and regional disparities. Secondly, the development of clear, consistent definitions

and descriptors for micro-credentials is essential. This foundational step would allow both internal and external quality assurance bodies to establish appropriate criteria for evaluating the quality of micro-credentials consistently and reliably.

Furthermore, the experiences from countries that have successfully implemented quality assurance systems for micro-credentials—such as those in Catalunya, Estonia, and Ireland—offer valuable lessons. These examples demonstrate that tailored external quality assurance methodologies, when combined with robust internal quality systems, can ensure that micro-credentials meet high academic standards while remaining flexible enough to address evolving training needs.

The evolution of micro-credentials represents both an opportunity and a challenge for HE. As these compact educational offerings become increasingly central to lifelong learning and workforce development, ensuring their quality through rigorous internal and external quality assurance measures is paramount. The MICROBOL project and the ENQA report underscore the need for education providers to uphold high standards by integrating micro-credentials into existing quality assurance frameworks and for Quality Assurance agencies to develop dedicated approaches that address the unique aspects of these learning units.

Addressing challenges such as definitional ambiguity and legislative gaps will require a concerted effort at both the national and European levels. By fostering international cooperation and leveraging successful experiences from across the continent, stakeholders can build a robust quality assurance ecosystem that not only guarantees the academic integrity of micro-credentials but also enhances their recognition and value in the broader educational and professional landscape.

4. Key Considerations for micro-credentials policies: reflections from the MCE project and other projects

As micro-credentials gain prominence in HE and lifelong learning, policymakers face both challenges and opportunities in their regulation and implementation. Developing an effective policy framework for micro-credentials requires a strategic approach that balances innovation with quality assurance, flexibility with credibility, and responsiveness to labour market needs with the protection of learners' interests.

This section explores the key issues that policymakers should consider when developing or refining regulatory frameworks for micro-credentials in institutional, regional or national countries. Critical topics include the definition and standardisation of micro-credentials, their integration into existing qualification systems, mechanisms for quality assurance, their

alignment with labour market demands, and sustainable funding models for both institutions and learners.

By addressing these considerations, policymakers will be better equipped to design strategies that support the equitable, effective, and coherent adoption of micro-credentials in line with national and European priorities for higher education and lifelong learning.

4.1 Quality (Issuing providers, Standards, Qualifications framework/systems)

Although the definition of micro-credentials is well defined both in EU published documents (Council Recommendation of 16 June 2022 on a European Approach to Micro-Credentials for Lifelong Learning and Employability, 2022) and in the literature (Antonaci et al., 2021; Brown et al., 2021; Ehlers, 2018) one can find that the adoption of the term as a formal type of course or as a certificate or as both is not yet established across all the MCE consortium partners. Six out of ten partners adopted the term 'micro-credential' as a type of short learning unit, while other partners use it as a certificate, and some use it as both a certificate and a learning unit (Weiß et al., 2022).

The terms 'micro-degree' and 'nano-degree', often found in the literature, are not adopted within the HE Institutions that are part of the MCE consortium (Caforio et al., 2022).

Equally, there is an understanding that the micro-credential certification is awarded only when the learning outcome is met (typically assessed through an assessment activity) and when there is a formal validation. In fact, 13 out of the 19 micro-credentials explored by Caforio et al. (2022) research were found to have a formal internal course validation procedure. The consortium has explored joint recognition of micro-credentials, and this is presented in 7 out of 19 of the examples given in the survey. Some of those joint recognitions have resulted from EU-funded projects (Antonaci et al., 2021).

The study by Caforio et al. (2022) found that 4 out of the 19 cases collected (26,3% of the sample) are accredited by external agencies. The issue of quality is one important element that is still largely underdeveloped in the micro-credentials area as highlighted in section three of the present report. The EU recommends that member states apply and adapt existing quality assurance mechanisms wherever possible, using 'skills-intelligence' systems to identify and analyse labour market needs, and encourages providers to publish their offering and their policy on recognition and integrate micro-credentials in national qualifications frameworks and systems. Annex II of the Council's recommendation states that micro-credentials should be subject to both internal and external quality assurance by the system producing them. However, it also emphasises that external quality assurance agencies should mainly focus on assessing the provider to ensure that they are "trusted" rather than the micro-credential itself, which should be assessed internally through existing internal

mechanisms (Council Recommendation of 16 June 2022 on a European Approach to Micro-Credentials for Lifelong Learning and Employability, 2022).

It is difficult to recommend any specific action to HE institutions as each member country maintains autonomy in how it builds a quality assurance system for micro-credentials and how it integrates such a system into existing mechanisms. Although recommending the use of the European Qualifications Framework, where applicable, and existing Standards and Guidelines for Quality Assurance in HE (*Standards and Guidelines for Quality Assurance in the European Higher Education Area - ESG*, 2015), the Council opens up the possibility for micro-credential providers to include “organisations, social partners, employers and industry, civil society organisations, public employment services (PES) and regional and national authorities” (Council Recommendation of 16 June 2022 on a European Approach to Micro-Credentials for Lifelong Learning and Employability, 2022). That is to say that the Council allows other providers, not usually involved in formal training, to offer micro-credentials provided they are considered “trusted”. This will inevitably cause a series of challenges which will lead to a tier system of perceived quality for micro-credentials, according to levelness, transferability between organisations (easier to do within HE because of existing ECTS structure), recognition (may be easier within HE and withing bigger and more reputed organisations, for example within the tech industry Apple, Alphabet or Microsoft), accountability (based on existing frameworks for HE and VET). Another challenge lies in the openness of the Council to allow each partner country to develop its own system for micro-credentials. Some countries may or may not use ECTS, they may create their own portability systems (although there is an explicit recommendation to use Europass and guidelines to ensure portability), and some countries may develop their own quality assurance system (although there is also a recommendation to leverage existing frameworks within HE and/or Further Education as explored above).

A further challenge lies in the possibility of non-formal learning, especially Informal learning, which is learning that results from daily activities and accumulated experiences that are not organised or structured in terms of objectives or workload. Whether those can be recognised by non-educational organisations and how this option will unfold is yet to be defined by each partner country. HE institutions traditionally have the capacity to recognise prior learning, particularly for adult learners who have accumulated learning experience. However, as explored above, there is no established system in partner countries to formally recognise prior learning—whether acquired through formal or informal experiences—outside educational institutions. This challenge is even greater because decisions regarding the recognition of prior learning outside the education sector are often subjective and vary between individual organisations. As a result, competence assessments may be carried out by individuals without the necessary expertise.

Adding to this complexity, the recommendations also allow for the integration of specific regional considerations within each partner country (such as different regulations across Spanish regions or German states). While this flexibility can accommodate local needs and address regional disparities, it also introduces additional layers of complexity and administrative structures.

4.1.1 Recommendation: Institutional Quality Assurance for Micro-Credentials

Higher education institutions should develop internal quality assurance systems for micro-credentials, ensuring alignment with existing mechanisms and procedures used for degree-bearing courses. This will help maintain academic standards, facilitate integration within qualification frameworks, and enhance the credibility of micro-credentials.

While national policies may vary, it is expected that quality assurance in higher education will primarily be managed at the institutional level, rather than through separate external mechanisms, such as dedicated quality assurance agencies or specific procedures in national quality assurance agencies for micro-credentials.

To maintain trust and transparency, institutions should establish clear internal guidelines, transparent assessment criteria, and robust monitoring practices, ensuring that micro-credentials are consistently recognised and valued both within and beyond the higher education sector. Furthermore, higher education institutions should explore partnerships with industry and other sectors, allowing external stakeholders to leverage established quality assurance systems for accrediting and recognising micro-credentials. Such collaboration can enhance the relevance of micro-credentials to labour market needs while reinforcing their reliability and portability across different professional and educational contexts.

4.2 Transparency: notional workload needed to achieve the learning outcomes

(using European Credit Transfer and Accumulation System – ECTS, wherever possible)

Micro-credentials should be measurable, comparable and easy to understand for both learners and employers, with clear information on learning outcomes, workload, content, level, and the learning offer (Council Recommendation of 16 June 2022 on a European Approach to Micro-Credentials for Lifelong Learning and Employability, 2022).

Whilst HE institutions should use the ECTS system and comply with the European Qualifications Framework, they should also demonstrate the notional workload needed to achieve the learning outcomes of the micro-credential, other providers not using ECTS may use other types of information that will evidence the workload and learning outcomes

achieved. The Council does not recommend how many workload hours or ECTS each micro-credential may entail. However, it does say that a micro-credential is a “small volume of learning” which contrasts with existing credit-bearing programmes that range from a minimum of 60 ECTS for 2nd cycle to 240 ECTS for 1st cycle. One can therefore assume that micro-credentials can range from 1 ECTS to 30 ECTS. Another way of exploring is the duration of the course leading to the micro-credentials recognition and whether micro-credentials are designed for full-time or part-time learners. The Council does not allude to this although, implicitly, they do state that micro-credentials are ideal for adult learning and those seeking to upskill or reskill themselves (European Skills Agenda for Sustainable Competitiveness, Social Fairness and Resilience, 2020). That is to say that part-time learners are probably the most relevant public for micro-credentials at least initially.

At the MCE consortium, micro-credentials are predominantly offered at the EQF level 6 or 7 range, with some courses also available at levels 5 or 8 (preparatory or doctoral level) (Weiß et al., 2022). The duration of these courses typically ranges from 4 to 26 weeks, equivalent to one to five months of study. The use of ECTS facilitates the comparability and transferability of micro-credentials across diverse programs and institutions. Furthermore, the adoption of the EQF empowers Higher Education Institutions to determine the level of micro-credentials, ensuring their recognition and comparability across different countries and educational contexts.

The allocation of ECTS for micro-credentials may vary depending on strategic considerations, such as whether they are designed for part-time or full-time learners, whether they are related to on-the-job training or learning independent from employment, the level of complexity of the intended learning outcomes, and the investment of time and money that learners are willing to make. The MCE consortium argues that micro-credentials could range from 1 to 30 ECTS. Still, consistency in the institutional approach is crucial to provide clarity and manage learners' expectations regarding each institution's offerings. This means that an institution should not be offering micro-credentials with 1 ECTS and with 30 ECTS but should have a more consistent approach, for example, offering micro-credentials ranging from 1 to 6 ECTS or from 6 to 12 ECTS, reflecting short to medium duration courses.

It is not expected that national regulations and policies will impose specific durations or workloads for micro-credentials, nor is it expected that sector-wide policies or directives will define anticipated durations and workloads. However, smaller workloads may be more appealing to prospective working learners, as they require less time invested to achieve the micro-credential's objectives and are easier to integrate into their existing commitments. Nevertheless, strategic decisions by HE providers to develop larger micro-credentials are also warranted, as they offer cost-effectiveness and ensure enhanced transferability and recognition.

The majority of micro-credentials are anticipated to be designed with 4 to 6 ECTS as suggested by MICROBOL (Cirlan & Loukkola, 2020) or the European MOOC Consortium (Iniesto, 2021), as this aligns with the prevailing credit structure used by most Higher Education Institutions in their current accredited study programmes. The concept of stackability (which will be further explored in this paper) opens the door for strategic decisions regarding the offering of micro-credentials and their potential integration into more formal and credit-bearing programmes.

4.2.1 Recommendation: Establish Clear and Consistent Credit Frameworks for Micro-Credentials

Policymakers should provide guidance on the credit allocation and level of micro-credentials to ensure transparency, comparability, and recognition across institutions and countries. While flexibility is important, it is recommended that higher education institutions align their micro-credentials with the European Credit Transfer and Accumulation System (ECTS) and the European Qualifications Framework (EQF). This alignment will facilitate their portability, stackability, and integration into formal education pathways.

To enhance clarity for learners and employers, institutions should adopt a consistent credit range, such as 1–6 ECTS or 6–12 ECTS, rather than offering micro-credentials with highly variable credit values from 1 to 30 ECTS. Establishing a structured approach will help manage learner expectations and improve trust in the value and coherence of micro-credentials.

Furthermore, while national policies should not impose rigid duration requirements, policymakers should acknowledge that smaller workloads (e.g., 1–6 ECTS) are generally more accessible to working professionals and part-time learners. Ensuring a balance between flexibility and structure will support broader participation and the effective recognition of micro-credentials in lifelong learning, reskilling and upskilling, as well as professional development.

4.3 Relevance

Relevance can be understood as the level of significance that learners attribute to the learning outcomes attained upon successfully completing a course. This perception of relevance can arise from various motivations, such as the need to enhance or acquire new skills, the pursuit of recognition for prior learning experiences, or the desire for personal growth and development. Within this context, the MCE project explores two studies that have undertaken comprehensive literature reviews on this topic. One study is part of the MCE project and was conducted by Bruguera et al. (2022), while the other was published by Brown and Mhichil (2022).

Bruguera et al. (2022) discovered that research papers on learning preferences frequently mention motivation as a driving factor for pursuing micro-credentials. Approximately 41% of

these studies identified the motivation to improve or enhance efficiency in one's current profession. Another 41% highlighted the desire for access to selected and relevant updated content. Additionally, other papers analysed by this study, cited curiosity, personal interests, and the flexibility of time, schedule, and access, as other significant reasons for enrolling in courses leading to micro-credentials.

Conversely, the study conducted by Brown and Mhichil (2022) sought to differentiate the key factors that motivate the adoption of micro-credentials. Their findings indicated that there were three primary drivers for embracing micro-credentials: (i) heightened employability, (ii) support for continuous professional development and workplace training, and (iii) greater flexibility in learning. However, the significance assigned to these drivers varied across different regions. In Europe, there was a greater emphasis on flexible learning, the promotion of lifelong learning, and improving employability. In contrast, the Americas and Asia-Pacific regions focused more on employability, bridging the skills gap, and facilitating work-based training and continuous professional development (Brown & Nic-Giolla-Mhichil, 2022).

By comparing these two studies, it can be concluded that skills development through upskilling or reskilling within a professional context and flexibility in learning are two key drivers for learners. It is important to note that micro-credentials are predominantly seen, by the papers reviewed by Bruguera et al. (2022), as a means to progress within one's current job or career, rather than primarily as a tool for job seekers or those seeking new employment opportunities. Additionally, it is noteworthy that many individuals pursue micro-credentials for the sheer pleasure of acquiring new knowledge, which is often overshadowed in the discourse surrounding micro-credentials that tend to emphasize their instrumental value in meeting employment-related requirements.

4.3.1 Recommendation: Encourage and support policies that mandate the active involvement of employers, third-sector organizations, and prospective learners in the co-design of micro-credentials.

As a result, the project proposes that higher education institutions undertake a proactive approach to address significant skill gaps prevailing in the labour market. To accomplish this, institutions should consider involving the third sector in the co-development of courses, collaborating with employers to identify essential learning outcomes, or conducting surveys among prospective learners to anticipate their personal and professional development needs. In all cases, the learning units leading to micro-credentials should exhibit flexibility and establish relevant connections with the professional setting. This notion is consistent with the findings of the Bruguera et al. (2022) study, which highlighted that a majority of the reviewed papers (59%) recognize that the key advantage of micro-credentials lies in their flexibility concerning scheduling, timing, and accessibility. Achieving flexibility can be facilitated

through adaptable timeframes and locations, as well as incorporating workplace-based learning that can be directly applied to professional contexts.

Direct stakeholder involvement in the design process yields numerous advantages, including the incorporation of stakeholders' needs and preferences, such as those of industry/organisations and potential learners, in the development of micro-credentials. This direct engagement also cultivates support and financial backing for the course, as stakeholders become actively engaged and vested in its success. Moreover, involving stakeholders directly aids in the identification of potential challenges and barriers related to the implementation of micro-credentials, facilitating the formulation of effective strategies to address them.

4.4 Valid Assessment

Assessment constitutes a pivotal element in higher education, serving as a means to demonstrate the attainment of specific learning outcomes. The Commission emphasizes the significance of assessing micro-credential learning outcomes in accordance with transparent criteria. This implies the establishment of measures and procedures to ensure that learners enrolled in a learning unit leading to a micro-credential undergo rigorous assessment as an integral part of their learning experience. This aspect holds particular relevance, given that, historically, a substantial proportion of micro-credential offerings originate from Massive Open Online Courses (MOOCs) or short courses delivered by prominent MOOC platforms such as Coursera, FutureLearn, or edX. Online assessment offers learners the convenience of completing assessments remotely, thereby providing them with flexibility and enhanced accessibility. This mode of assessment can take various formats, such as multiple-choice questions, short answer questions, essays, or projects, among others. In contrast, offline assessment requires learners to undertake assessments in person, either on campus or at designated proctored testing centres. Offline assessments may include formats similar to online assessments but can also encompass practical or performance-based assessments, including laboratory work, simulations, or presentations (Caforio et al., 2022).

In their comprehensive study of existing micro-credentials within the MCE consortium, Caforio et al. (2022) observed a diverse range of learner supervision methods during the assessment process. These supervision methods for assessing micro-credentials can encompass both in-person and online proctoring, wherein a proctor closely monitors the assessment process to prevent dishonest practices. In the case of online proctoring, it can be achieved through manual supervision or digital supervision using techniques such as lockdown browsers, camera invigilation, and/or artificial intelligence. Alternatively, micro-credentials may employ alternative assessment methods such as peer assessment, self-assessment, or automated assessment, which can provide comparable levels of support and feedback without the need for direct supervision.

Among the 19 micro-credentials examined in their study, Caforio et al. (2022) found that three were unsupervised with identity verification, 13 were supervised online with identity verification, and three were supervised without identity verification. In the context of micro-credentials offered online, it is crucial to be able to establish the identity of the participant to ensure that the appropriate learner receives credit for their assessment. As the interaction between the institution and the learner is often limited in duration, there are fewer opportunities to visually verify the learner's identity and cross-reference it with an existing photo ID. This situation is less likely in micro-credentials delivered face-to-face where there is a constant visual verification of the learner being assessed.

Although they are short learning units and they do not lead, in principle, to accredited full study programs, it is important that micro-credentials learning outcomes are rigorously assessed and learning outcomes acquisition is verifiable as it ensures the credibility of both the provider and the offer.

4.4.1 Recommendation for Policymakers: Ensuring Rigorous and Credible Assessment in Micro-Credentials

Policies should promote a balanced approach that integrates rigorous assessment methods—whether online or offline—while maintaining accessibility and flexibility for learners. Additionally, institutions should be encouraged to adopt secure identity verification mechanisms that uphold academic integrity without creating unnecessary barriers for learners. This will strengthen the reliability of micro-credentials and facilitate their wider acceptance by employers and educational institutions.

4.5 Learning pathways (Stackability, Validation of non-formal and informal learning)

“Micro-credentials are designed and issued to support flexible learning pathways, including the possibility to validate, recognise and ‘stack’ micro-credentials from across different systems” (Council Recommendation of 16 June 2022 on a European Approach to Micro-Credentials for Lifelong Learning and Employability, 2022).

This ambition from the European Union is both bold and complex. It suggests that micro-credentials may be stackable, i.e., the possibility they are designed to be modular so that other micro-credentials may be added to create larger credentials and that they are recognised and portable to other systems, i.e., from higher education to VET or to industry,

and vice-versa. The European Union also states that the decision to accept micro-credentials and to “stack” them into a larger credential is of the receiving organisation and that that decision of “stacking” does not imply an automatic entitlement to a qualification or a degree, rather a modularisation of the curricula in order to ensure that institutions can break down a comprehensive course within a larger program into smaller units, each with its own set of distinct learning outcomes and assessments.

The integration of these smaller learning units can result in the formation of a micro-credential that effectively caters to the specific needs of learners and employers. To exemplify this concept, the MCE project draws upon the work of Caforio et al. (2022) and considers the illustration of a digital marketing course. In this case, the course can be modularized into smaller units encompassing various topics including social media marketing, search engine optimization, and online advertising. Through the combination of these distinct units, a comprehensive micro-credential specializing in the field of digital marketing can be developed.

One potential risk associated with using modularization is that institutions may rely on existing provisions, reusing and reselling them without tailoring them to the demands of the labour market or the specific needs and requirements of participants. This strategy can be convenient for higher education institutions as they can leverage the same resources such as lecturers, administrative staff, and physical or online spaces for both micro-credential and degree-bearing learners. Consequently, micro-credential learners may subsequently transition to degree programs, leveraging their micro-credential accreditation.

It is important to note that the concept of "stackability" can encompass various approaches, including the one discussed by Caforio et al. (2022) wherein individual micro-credentials are combined to form a larger micro-credential.

In the MCE consortium, 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. Out of the 19 short learning courses examined by Caforio, et al. (2022), it was found that eight courses were Independent/standalone, five were stackable within other short courses and 11 were designed for being recognized in formal degree programs. Among the partner institutions, it is worth noting that only one institution has established all micro-credentials explicitly from the ground up (Weiß et al., 2022) without reusing existing provisions.

4.5.1 Recommendation: Promoting Quality and Relevance in Stackable Micro-Credentials

A key recommendation is to develop policies that encourage higher education institutions to design stackable micro-credentials with a focus on labour market relevance and learner needs, rather than solely repurposing existing course content. Institutions should be

encouraged to engage with employers, professional bodies, and learners in the co-design of modular learning units to ensure that stackability leads to meaningful skill acquisition and career progression. Additionally, policies should establish transparent criteria for recognizing and integrating micro-credentials across different education and training systems, fostering a seamless transition between higher education, vocational education, and industry.

4.6 Recognition

Micro-credentials have the capacity to signal specific learning outcomes within smaller learning units. Recognition of these micro-credentials establishes a pathway for a broader range of comparable learning experiences across individual countries, and the European Union. According to the European Union, micro-credentials, whenever feasible, should be acknowledged by relevant authorities for academic, training, or employment purposes, provided that they are in accordance with the European standards and with the principles governing their design and issuance (see further guidance in the Council recommendation - Council of the European Union, 2022). In cases where formal education providers issue micro-credentials, recognition is granted, whenever possible, through standard recognition procedures employed for acknowledging qualifications and periods of learning abroad. Recognition should also be considered at an informal level, i.e., outside the providers of the micro-credentials, in particular the labour market. In a traditional education setting, rooted in hundreds of years of tradition, this will pose complex challenges to both Higher and Vocational Education as well as employers. This raises critical questions about micro-credentials: How can we ensure that micro-credentials are recognized with a comparable level of rigour to formal degrees? Is the value attributed to micro-credentials equivalent to that of traditional degrees, or are we introducing different value propositions based on formality, workload, and tradition? Will internal stakeholders, including lecturers and learners, perceive the value of micro-credentials in the same manner? To what extent is traditional higher education prepared to adapt its offerings to accommodate a new type of learner and learning paradigm that emphasizes skill development and practical applicability? And how will employers compare micro-credentials to formal degrees? Is there the risk of replacing the value they give to formal degrees with micro-credentials? Or is it the case that universities have to work directly with employers to explain the concept and ensure their quality and relevance? Will an employee have the same recognition from a micro-credential when comparing it with a formal degree? Should it have?

All these questions still remain open and will likely only start to be addressed once each partner country starts having its own regulations and policies. At this stage, they are still topics of ongoing discussion and debate, requiring further exploration and collaboration among educational institutions, policymakers, and stakeholders.

As part of its outputs, the MCE consortium reports that one of the most pressing issues reported by learners, in relation to micro-credentials, is the lack of recognition (Bruguera et al., 2022). Those concerns are especially detected when the course that leads to the micro-credential is a MOOC which is still the most common form of leading to a micro-credential (Kumar, 2019). Credentials are important as a seal of quality provided by the institution, hence why it is important that micro-credential learners are seen as having the same value for institutions as traditional learners. Credentials are "tangible" proof that learners have the knowledge and skills that are required for a specific job or position, complementing their CV or their digital portfolio (Bruguera et al., 2022; Maina et al., 2022).

4.6.1 Recommendation: Enhancing Recognition and Trust in Micro-Credentials

Another key recommendation is to develop a structured framework for the formal and informal recognition of micro-credentials, ensuring alignment with European standards while addressing national regulatory needs. Policies should facilitate collaboration between higher education institutions, vocational training providers, and employers to define transparent and comparable criteria for evaluating micro-credentials alongside traditional degrees. Furthermore, initiatives should be launched to raise awareness among employers, educators, and learners about the value and credibility of micro-credentials, fostering their acceptance in both academic and labour market contexts. Standardised digital credentialing and verification mechanisms should also be promoted to enhance trust and comparability across sectors and countries.

4.7 Portability

Micro-credentials are the property of the credential-holder, who is typically the learner, and can be conveniently stored and shared by the individual. The Council envisions Europass as a digital wallet that may help to facilitate this process while adhering to the guidelines set forth in the General Data Protection Regulation. The data storage infrastructure should be built upon open standards and data models, promoting interoperability and facilitating the seamless exchange of information. This framework should also enable efficient verification of data authenticity. An exemplary initiative in this domain is the European Learning Model (ELM)¹, an open-source software platform developed under the auspices of the European Commission. The primary objective of the ELM is to facilitate the recognition and validation of skills and competences acquired through non-formal and informal learning contexts. It provides individuals with the means to create and manage their digital portfolios, encompassing both formal qualifications and non-formal/informal learning accomplishments. Notably, the ELM embraces the use of digital badges and blockchain certification to ensure secure and transparent recognition and validation of learning achievements (Caforio et al.,

¹ <https://europa.eu/europass/pt/news/launch-european-learning-model>

2022). The development of the ELM aligns with the European Commission's unwavering commitment to fostering lifelong learning and establishing a European Education Area.

Digital badges can also be a solution as they form a digital credential that facilitates the recognition and verification of learning accomplishments. They are designed to be portable, shareable, and verifiable, capable of representing a broad spectrum of learning achievements, ranging from minor skills to complete degrees. Digital badges incorporate metadata, including information about the issuer, earner, criteria, and evidence, which contribute to verifying the authenticity and relevance of the credential. It is noteworthy the work carried out in different EU-funded projects such as ECCOE which presented not only a template for higher education institutions to establish mutual recognition agreement – Model Credit Recognition Agreement – but also a Practical Guideline to issue digitally signed credentials through Europass Digital Credentials for Learning².

From a technical perspective, Blockchain technology presents a potential solution for certifying and verifying micro-credentials (Caforio et al., 2022). Blockchain technology, characterized by its decentralized ledger system, plays a crucial role in facilitating secure and transparent record-keeping and transactions, eliminating the need for intermediaries. Leveraging the functionalities of blockchain, micro-credentials can be securely stored and validated, guaranteeing their integrity and authenticity through an immutable process. Nonetheless, substantial efforts need to be made at both the national and European levels to establish mechanisms that enable the portability of micro-credentials. It is plausible that the technical infrastructure can contribute to achieving this consistency, provided that the chosen system enforces key aspects defining what a micro-credential should entail.

4.7.1 Recommendation: Ensuring Secure, Portable, and Verifiable Digital Micro-Credentials

Another recommendation is to promote the development and widespread adoption of interoperable digital credentialing systems, such as Europass and the ELM, to ensure the secure storage, portability, and verification of micro-credentials across Europe. Policies should mandate the use of open standards, blockchain technology, and digital badges to strengthen trust, transparency, and recognition of learning achievements across formal, non-formal, and informal education contexts. Additionally, national initiatives and policies should support institutions in implementing secure digital credentialing frameworks that comply with data protection regulations while facilitating national, cross-border and cross-sector recognition of micro-credentials. Policies about micro-credentials should provide concrete guidelines on the storage, verification, and transfer of credentials between issuing institutions and between learners and institutions, ensuring a seamless and standardised process.

² <https://eccoe.eu/eccoe-system/>

4.8 Mode of delivery of micro-credentials

Various considerations come into play when planning and designing micro-credentials, including decisions regarding their modality, timing, and format. In the case of the MCE consortium, a significant proportion of the partner institutions' micro-credentials are exclusively online, and even those institutions primarily offering face-to-face instruction have chosen to invest in online micro-credentials. Online delivery provides learners with the flexibility to access course materials and participate in activities from any location and at their convenience. Conversely, face-to-face delivery requires learners to commute to the university, which can be challenging for many, considering their professional, personal, and academic commitments. Consequently, face-to-face learning necessitates a more condensed approach, and working learners must make a greater investment of time and effort to balance their competing obligations. That is probably why the concept of micro-credentials has started in online provision and only recently has come to the face-to-face university (Lemoine & Richardson, 2015).

Then there is also the question of size which can be achieved with online learning that would be difficult to achieve with face-to-face learning. Nevertheless, cohort sizes are also a relevant question to ask institutions when preparing for micro-credentials. This is because it is worthwhile discussing the value of a micro-credential that is an outcome of participating in a MOOC compared with a smaller size cohort of learners with a dedicated lecturer. Different authors discuss from different angles the value of MOOCs and how they are perceived by learners and the labour market (Bruguera et al., 2022; Gaskell & Mills, 2014; Kumar, 2019).

Online learning is considered to be the preferable mode of delivery according to Bruguera et al. (Bruguera et al., 2022). Learners can access content anytime and from anywhere (Kumar, 2019); the flexibility of online learning suits learners' needs and personal and professional commitments (Aittola & Ursin, 2019) and can take advantages from lecturers who are coming from across the country and from within different countries in Europe (Ambadkar, 2020).

Another crucial aspect to consider is the balance between synchronous and asynchronous learning methods. It is worth discussing whether one should predominantly rely on synchronous or asynchronous approaches. In theory, every element of a course that offers learners flexibility becomes vital, especially for individuals who are concurrently employed and value the convenience that asynchronous online learning provides. However, synchronous activities have the advantage of signalling the presence of the instructor, enabling micro-credential learners to engage in real-time interactions with their peers and teachers. This interactive experience is particularly valuable for learners, especially those who are returning to study after a significant interruption, as is often the case with adult learners. Micro-credentials can also be offered in mix formats such as blended, hybrid or combining synchronous and asynchronous as discussed by Caforio et al. (2022).

Bruguera et al. (2022) provide evidence from other studies that learners enjoy asynchronous learning as participation is voluntary (Coleman, 2018) and suits their schedule and that it helps reconcile work and family life (Ruiz-Palmero et al., 2020).

Within the MCE consortium, the examined courses primarily adopt an asynchronous format, incorporating an average of approximately 19% synchronous activities (Caforio et al., 2022). Nevertheless, it is worth noting that the majority of these courses (15 out of 19) adhere to a predetermined schedule, allowing instructors to facilitate various activities and discussions.

There is no specific recommendation about whether institutions should follow online or face-to-face modes of delivery for the development of micro-credentials. As seen above, micro-credentials originated from distance learning and therefore, it becomes natural that the majority of examples come from courses that are online. With larger investments in the area, new and innovative approaches to micro-credentials will inevitably emerge, particularly in higher education. Although there is little evidence of research about face-to-face micro-credentials, it is probable that by the end of the year, with clear guidelines from national governments, new findings will emerge about face-to-face micro-credentials and more empirical evidence of comparison of modes of delivery will be published.

5. Final considerations

Micro-credentials have emerged as a flexible and targeted approach to lifelong learning, enabling individuals to acquire specific, market-relevant skills. However, their long-term sustainability hinges on the implementation of robust institutional and policy frameworks that integrate flexibility with quality assurance, financial viability, and social relevance. The MCE project has confirmed—through evidence gathered across pilot activities (Feliz- Murias, T., et Al. (2025)), stakeholder evaluations (Corbelli, G., et Al, (2025).), and institutional guidelines (D4.2- Van Melkebeke, L., Op de Beeck, I., & Antonaci, A. (2025))—that the momentum behind micro-credentials is strong, but not yet matched by systemic consistency across Europe.

A key area of concern identified in both Corbelli, G., et Al, (2025); and Van Melkebeke, L., et Al., (2025) is the lack of clear institutional strategies for funding and sustaining micro-credentials. Unlike traditional degrees, micro-credentials operate on shorter cycles, often with lower enrolment fees, which challenges institutional cost recovery. The pilot studies from D5.2 illustrate this dilemma in practice, where varied durations and ECTS loads resulted in operational diversity but limited economies of scale. To address this, diversified business models are essential—combining fee-based enrolment, public funding (e.g. as seen in Spain’s Microcreds initiative and Portugal’s Adult Impulse Initiative), and private partnerships. These

approaches must also consider equity, as fee-based models risk excluding underserved learners unless offset by scholarships or employer sponsorship.

Moreover, and Van Melkebeke, L., et Al., (2025) underscores that institutional readiness is not solely a matter of technical capacity, but also of **cultural and structural integration**. Academic and administrative staff require clear roles, support structures, and financial models that align with the goals of lifelong learning. Institutions should be empowered to embed micro-credentials into mainstream offerings—not as isolated experiments, but as legitimate components of strategic curricula. This also includes supporting staff in navigating quality assurance, recognition, and student guidance systems.

Another pillar of sustainability lies in recognition and stackability. As echoed across Feliz-Murias, T., et Al. (2025) and Corbelli, G., et Al. (2025), learners and employers alike value micro-credentials more when they are clearly embedded within recognised qualifications frameworks and when they offer progression pathways. Modularisation and stackability are particularly valuable for learners seeking incremental achievement toward full qualifications. Deliverable D4.2 provides a roadmap for designing such stackable offerings and aligning them to EQF levels and ECTS, while Feliz- Murias, T., et Al. (2025) shows how pilots have practically implemented these concepts across diverse institutional contexts. However, Corbelli, G., et Al., (2025) notes that the **observability** of these benefits—especially among students—remains low, and must be improved through better communication strategies and digital visibility.

Digital infrastructure is another critical enabler. The integration of credentialing platforms, blockchain verification, and digital wallets like Europass supports the portability and trustworthiness of micro-credentials. This interoperability—emphasised in Casa Nova, D., Bastos, G., & Antonaci, A. (2025) and echoed in Van Melkebeke, L., et Al., (2025)'s implementation guidelines—is essential for cross-border mobility and employer confidence. National and EU policymakers must promote standardised and secure digital infrastructures to reduce administrative burdens while enhancing verification and comparability.

To advance the strategic role of micro-credentials, it is therefore essential to:

- **Align institutional practice with EU-level frameworks**, as described in Casa Nova, D. et Al. (2025) and piloted in Feliz- Murias, T., et Al. (2025), ensuring quality, transparency, and recognisability across systems.
- **Foster multi-stakeholder co-design**, as evidenced in both Van Melkebeke, L., et Al., (2025)'s institutional seminars and Corbelli, G., et Al., (2025)'s data on employer involvement, to ensure market relevance and broader societal impact.

- **Support quality assurance systems**, aligned with ESG principles and Bologna tools, to enhance institutional credibility and learner trust.
- **Promote flexible and stackable learning pathways**, validated through Feliz- Murias, T., et Al. (2025) pilots and Corbelli, G., et Al., (2025) survey data, to enable personalised and career-relevant learning journeys.
- **Encourage national policy coherence and innovation**, supporting experimentation while providing structured guidelines for funding, validation, and portability.

In summary, the findings across MCE deliverables converge on a shared conclusion: micro-credentials hold enormous potential, but only if they are embedded in coherent, learner-centred, and systemically supported frameworks. Institutions cannot scale micro-credentials alone; their sustainability depends on ongoing collaboration between education providers, governments, employers, and learners. A unified European strategy that builds on grassroots innovation (Feliz- Murias, T., et Al. (2025)), institutional capacity-building (Van Melkebeke, L., et Al., (2025)), and stakeholder validation (Corbelli, G., et Al., (2025)), as outlined in this position paper, is key to mainstreaming micro-credentials as a credible and strategic element of lifelong learning in Europe.

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