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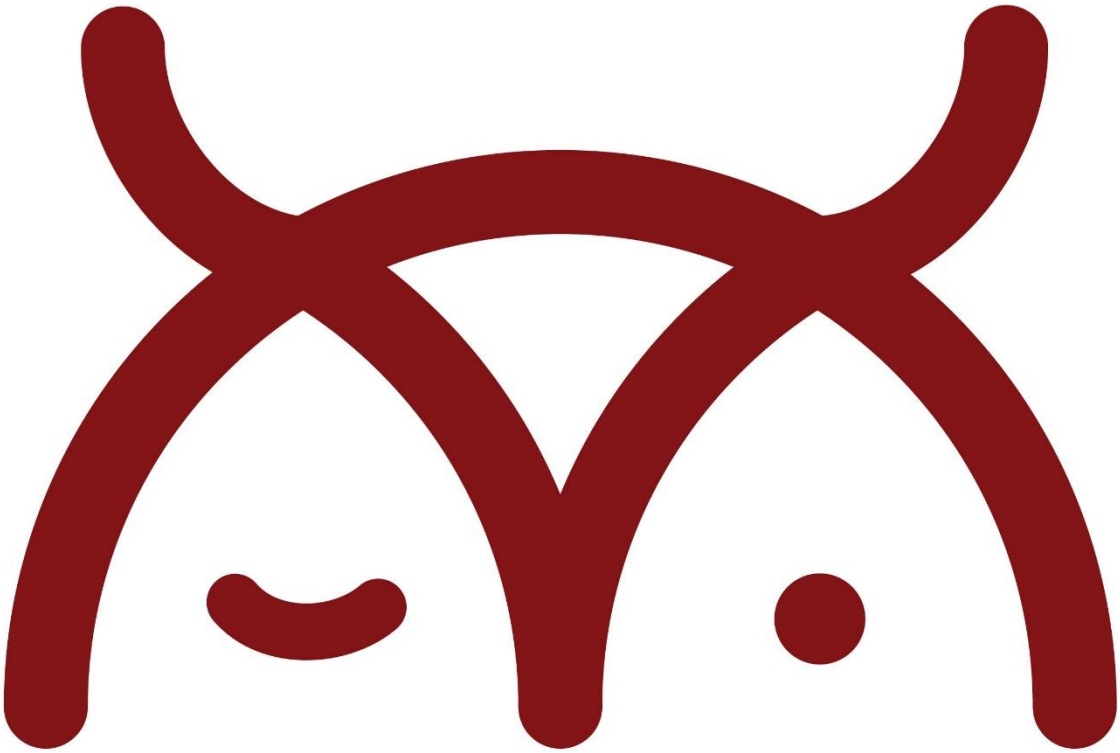

In-depth Analysis of the Most Recent Recommendations and Tools for Awarding Micro and Digital Credentials

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1. Definition and classification of micro-credential

1.1. What are micro-credentials?

Many different terms are used to describe what this report refers to *micro-credentials*. Common synonyms include "alternative credentials," "digital badges," "micro-certifications," "web badges," "open badges," "mini degrees," and "nano degrees." The diversity of terms reflects both the emerging prominence of this credential-type and its ongoing evolution in practice and policy (Tamoliūnė et al., 2023; Varadarajan et al., 2023). For the purpose of this report, micro-credentials are defined in line with the European Commission:

"*a proof of the learning outcomes that a learner has acquired following a short learning experience. These learning outcomes have been assessed against transparent standards. The proof is contained in a certified document that lists the name of the holder, the achieved learning outcomes, the assessment method, the awarding body, and, where applicable, the qualifications framework level and the credits gained. Micro-credentials are owned by the learner, can be shared, are portable, and may be combined into larger credentials or qualifications"* (European Commission, 2020).

This conceptualisation was later expanded in the Council Recommendation on 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. Those may be standalone or combined into larger credentials. Those are underpinned by quality assurance following agreed standards in the relevant sector or area of activity" (Council of the European Union, 2022).

While the European Commission and Council definitions emphasise policy alignment and transparency of standards, UNESCO's framing as shown in Figure 1, complements them by focusing on the pedagogical and functional aspects of micro-credentials as verifiable, quality-assured learning achievements awarded by trusted providers and capable of being combined into larger qualifications (UNESCO, 2022).

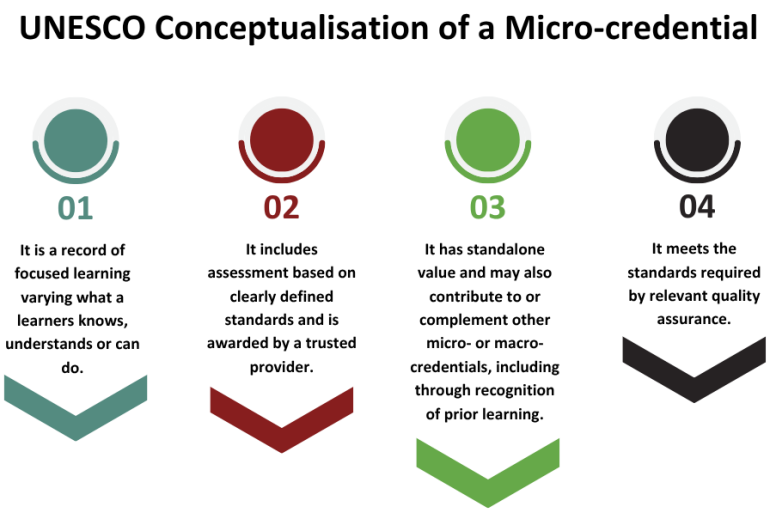

Figure 1. UNESCO conceptualisation of a micro-credential UNESCO (2022)

Building on the above definitions, Table 1 positions micro-credentials in relation to other emerging forms of short, flexible learning recognition, such as MOOCs, badges, and micro-degrees. The comparison illustrates both their shared characteristics and the distinctive features that distinguishes micro-credentials from other short modular learning pathways (MICROGUIDE, 2023).

Table 1. Comparison of micro-credentials with MOOC, badges and micro-degrees

MOOC	MICRO-DEGREES
➢ Online courses typically designed for a large number of participants. ➢ Mostly, does not reach the level of quality required to replace or be considered as substitute for traditional higher education. ➢ Expands the existing forms of teaching. Often offered by private providers.	➢ Hyper-focused and short-term degrees, designed to be immediately applicable to a very specific profession. ➢ The fundamental idea is that topics covered by study programmes can be broken down into micro-components and re-assembled to achieve maximum modularization.
BADGES	**MICRO-CREDENTIALS**
➢ Symbolic rewards issued to learners for (learning) success achieved; can be a type of micro-credential. ➢ Can serve as a positive mechanism that motivate learners to complete module or purchase learning offers. ➢ Typically, may not have any assessment component or formal processes to ensure academic quality and assessment rigour.	➢ Certificates awarded for successful completion of an educational unit, which is shorter than a course of study and can be conducted flexibly at any time. ➢ Usually follow a formally approved or accepted set of standards. ➢ There is a demand for them to be recognised and awarded by higher education institutions.

Micro-credentials are increasingly recognised as a distinct way of documenting learning. They are concise, assessed, and quality-assured, yet flexible enough to fit different learning and employment contexts (Varadarajan et al., 2023). Despite the variety of terms used across institutions and initiatives, there is a clear movement toward shared principles that emphasise verified learning outcomes, transparent standards, and portability (Council of the European Union, 2022).

1.2. Classification of micro-credentials

Research evidence has shown that for many learners, acquisition and verification of skills and knowledge are the two main motivators for enrolling in micro-credential programmes (Kato et al., 2020). According to the MicroHE (2019), micro-credentials are classified into three categories: skill credentials, micro-credential modules, and short learning programs.

'Skill credentials' are a new means of recognizing and certifying the skills, knowledge, capabilities, and accomplishments of individuals, allowing learners to connect with recruiters and new opportunities. Micro-skill credentials typically:

- involve 4-12 hours of learning
- are awarded within the context of non-formal education
- are not explicitly quality-assured by external quality assurance
- are linked to the acquisition of a specific competence

Gamrat et al. (2016) describe four kinds of such skill credentials:

1. Competency-based with a simple binary outcome, either the learner did or did not demonstrate the competency.
2. Stratified micro-credentials are similar to traditional grading. Tiered credentials are awarded for attaining different levels of quality or performance (i.e., gold, silver, bronze, A, B, C, or novice, proficient, or expert).
3. Hierarchical micro-credentials that reflect a progressive series of learning challenges or skills that build upon each other.
4. Meta-credentials and pathways that guide learners along a complex or comprehensive learning path.

Open Badges, the predominant standard for digital credentials, were initially developed by the Mozilla Foundation and are now maintained by the IMS Global Learning Consortium. These badges are digital images containing embedded metadata and are adopted for skill-credentialing purposes. Learning Management Systems such as Moodle enable the issuance and sharing of Open Badges through platforms like Mozilla Backpack, LinkedIn, and Facebook (Peer 2 Peer University & The Mozilla Foundation, 2011; Priest, 2016). Within the European context, the European Commission is promoting the Europass Digital Credentials for Learning (EDCL) framework as the preferred approach for issuing, verifying, and sharing micro-credentials in line with EU quality assurance and interoperability standards (European Commission, 2022)

organisation

Recent studies indicate a rapid expansion of digital credentialing in the labour market, with major global organisations such as IBM, Microsoft, Oracle, AICPA, GED, and AHIMA adopting Open Badges for verified learning and professional recognition (Fong et al., 2016; CEDEFOP, 2022)

Micro-credential modules are typically between 1-5 European Credit Transfer and Accumulation System (ECTS) credits, which correspond to roughly 25 to 150 hours of student workload. They are focused on academic skills and are often unbundled from degree programmes, with the possibility of being 'rebundled' to make up parts of other academic programmes. Micro-credential modules can be structured as MOOCs, though not exclusively. They typically:

- represent 25-150 hours of learning
- are awarded within the context of formal education, and include options for assessment
- are often explicitly quality assured by external quality assurance (QA)
- are linked to the acquisition of a set of academic learning outcomes.

Short learning programs, a new addition to micro-credentials, are also known as micro-qualifications. These programmes signify the attainment of academic skills through a bundle of courses. The courses could be offered in two modalities:

- a set of 'module-based' micro-credentials that can be taken independently or stacked into a larger credential.
- a set of courses that are only available as part of a short-learning program.

Short learning programs are often tied to different career stages and can be essential for entering certain professions or for ongoing professional development. Essentially, short learning programs typically:

- represent 150-1500 hours of learning.
- are awarded within the context of formal education and include options for assessment.
- are always explicitly quality assured by external QA.
- can be mapped to qualification frameworks, either as 'partial qualifications' or as a special category of micro-qualifications.
- are linked to specific career progression goals.

1.3. Role of micro-credentials

Micro-credentials broaden learning and skills development opportunities, contributing to lifelong learning in higher education. Those offer flexible, lower-cost options for learning in terms of time, location, teaching methods, and access, reaching diverse age and social groups. While not replacing traditional qualifications, micro-credentials enable targeted skill and competency acquisition, presenting new opportunities for HEIs and fostering learner-centered, competence-based professional development. They benefit not only professionals but also students at the bachelor 's, master's, and doctoral levels.

Policymakers' perspective

The growing demand for upskilling and reskilling the workforce, along with the need for flexible and inclusive learning paths to accommodate a diverse student population, has led policymakers to focus on new credentials and smaller learning experiences (European Training Foundation, 2022; OECD, 2023). Unlike traditional degrees, micro-credentials are promoted as shorter, more targeted, and more flexible solutions to meet the immediate needs of society and the labour market. They bridge

the gap between academic programs and the skills required by employers, enhancing the efficiency of education systems and fostering innovation that allows new providers to compete in the higher education market (Microbol, 2020).

Higher education institutions' perspective

Higher education institutions (HEIs) are increasingly offering micro-credentials to provide specialized training, enhance visibility, attract diverse students, and meet labour market demands, while also experimenting with innovative pedagogies and technologies (Fain, 2018).

Surveys show that a quarter of European and U.S. institutions use MOOCs to increase visibility and student recruitment (Jansen & Schuwer, 2015). In the U.S., 64% of institutions see alternative credentials as crucial for their strategy and income (Fong et al., 2016), and 62% of respondents in Europe report a growing demand for short-term learning (Gaebel & Zhang, 2018). The 2018 Bologna Process Report confirms that over half of institutions in most European Higher Education Area (EHEA) countries offer flexible learning paths (European Commission, 2018).

Learners' perspective

Many learners view micro-credentials as a stepping stone to traditional degrees, with 12% of those starting MicroMasters and Specialization programs planning to pursue a conventional degree afterward (Hollands & Kazi, 2019). However, micro-credentials are more often seen as a way to gain interdisciplinary skills and improve job market competitiveness. Those offer focused, practical, and current content, personalized education, open access to knowledge, and flexible schedules (MicroHE Consortium, 2019).

Kato et al. (2020) found that the main motivations for pursuing micro-credentials are skill acquisition and knowledge verification. Data from PIAAC shows that around 70% of individuals in non-formal education engage in job-related programs, with half aiming to enhance career prospects or job performance (OECD, 2019). Additionally, 55% of institutions in a recent EUA survey indicated that non-degree short courses primarily serve lifelong learners, and 43% see these courses as alternatives to master's degrees for some students.

Micro-credentials can be integrated into traditional degrees by "breaking down" larger programs into smaller, customizable modules. This approach offers affordable and accessible education with fewer admission barriers. A Class Central survey revealed that about half of MOOC learners would consider paying for a certificate if it were offered by a higher education institution (Shah, 2017).

Employers' perspective

Employers increasingly value workers with diverse and continuously evolving skills. These skills can be developed through various forms of learning, including short courses, workshops, or work-based experiences that complement formal education (World Economic Forum, 2020). A study by Dussarps (2018) found that 73% of employers view MOOC experience positively, associating it with desirable traits like curiosity, autonomy, remote work ability, and self-discipline. Despite this, traditional higher education qualifications remain important. More than half of U.S. hiring managers consider conventional degrees reliable indicators of skills and perseverance (Gallagher, 2018). Micro-credentials can

make it easier for employers to identify specific skills, yet awareness of these credentials remains low. Research from the MicroHE project and Gallagher's study shows that many employers are unfamiliar with micro-credentials, often mistaking them for simple attendance certificates.

Nonetheless, over 60% of hiring managers believe that the growing need for lifelong learning will increase demand for higher education.

2. Scope of micro-credential

2.1. European Commission policy interventions related to micro-credentials

The European Commission (EC) has been actively promoting the development and recognition of micro-credentials as part of its broader efforts to modernise education and training systems. Several key policy interventions demonstrate this commitment.

In September 2020, the EC published the Communication Achieving the European Education Area by 2025 (European Commission, 2020a), which outlined six strategic dimensions for transforming education systems across the EU. A European approach to micro-credentials is central to the second dimension, which focuses on inclusion and gender equality. As stated in the Communication:

"*The Commission will work towards the development of a European Approach to micro-credentials to help widen learning opportunities and strengthen the role of higher education and vocational education and training institutions in lifelong learning by providing more flexible and modular learning opportunities…"* (European Commission, 2020a, p. 15).

The Communication also underscores the contribution of higher education to lifelong learning and to engaging a more diverse group of learners.

Further advancing this agenda, the European Skills Agenda for Sustainable Competitiveness, Social Fairness and Resilience (2020–2027) positions skills at the centre of EU policy to promote sustainable growth and support recovery after the COVID-19 pandemic. The Agenda introduced 12 flagship initiatives, including one specifically devoted to developing a European approach to micro-credentials. According to the document:

"The Commission will develop, together with all relevant stakeholders, European standards which address minimum requirements for quality and transparency; explore the inclusion of micro-credentials in qualifications frameworks, in dialogue with national qualification authorities; make it easier for individuals to store and showcase to employers acquired micro-credentials through Europass and its Digital Credentials" (European Commission, 2020b).

The EC's *Digital Education Action Plan (2021-2027)* (European Commission, 2020c) continues to emphasise the importance of promoting inclusive and accessible digital education. The Plan prioritises:

- Fostering the development of a high-performance digital education ecosystem.
- Enhancing digital skills and competences for digital transformation.

Together, these policy interventions demonstrate the EC's commitment to fostering the development, recognition, and uptake of micro-credentials. By leveraging these credentials, the Commission aims to make education and training more flexible, inclusive, and responsive, ultimately supporting lifelong learning, employability, and the evolving needs of individuals, the labour market, and society across Europe.

2.2. European Approach to Micro-credentials

The diversity of micro-credential providers, such as higher education institutions (HEI), vocational education and training (VET) providers, companies, trade unions, industry bodies, private providers, and civil society organisations, raises concerns about ensuring transparency, quality, recognition, and

portability across countries and sectors. This diversity leads to a lack of standardization, varied quality assurance approaches, and inconsistent recognition processes, making the value of these credentials unclear (MicroHE Consortium, 2019).

The growing demand for micro-credentials highlights the need for standardization and mutual understanding. Despite efforts to define micro-credentials, their varying formats and definitions challenge their quality, recognition, transparency, and portability. These issues limit the trust and broader acceptance of micro-credentials, hindering their potential for supporting reskilling, upskilling, lifelong learning, and mobility.

Many higher education institutions, including those in the Erasmus+ European Universities initiative, are developing micro-credentials, but a unified definition and approach to validation and recognition are missing (OECD, 2021). To address this, the European Commission aims to establish trust in micro-credentials across Europe by proposing a Council Recommendation for their recognition and portability by 2025 (European Commission, 2020c).

An ad-hoc consultation group of experts from various European countries, including national authorities, quality assurance agencies, and higher education institutions, was formed to propose a common definition and recommendations for a European approach to micro-credentials. Their report informed the *Council Recommendation on micro-credentials for lifelong learning and employability* (Council of the European Union, 2022), which sets out standard elements for describing, designing, and issuing micro-credentials in order to promote coherent development and comparability across member states, stakeholders, and providers.

The recommendation supports high-quality and transparent micro-credentials, promoting new, inclusive, and tailored learning opportunities. It emphasizes a shared understanding and common definition to build trust and avoid multiple interpretations. It also aims to integrate micro-credentials with National Qualification Frameworks and current certificates and diplomas, addressing all education, training fields, and labour markets.

Furthermore, the Europass Digital Credentials Infrastructure (EDCI) facilitates the digital issuance, sharing, and storage of verified learning achievements, including micro-credentials. it operates in connection with the European Student Card Initiative and is based on the European Learning Model (ELM), which provides a common data standard for describing learning outcomes and achievements. Within this infrastructure, the Europass Digital Credentials for Learning (EDCL) frameworks enables institutions to issue secure, verifiable, and portable credentials across Europe (Europass European Union, 2014; Orr et al., 2020; European Commission, 2020).

2.3. Micro-credentials and the labour market

Employers are on the lookout for efficient training methods to enhance productivity, and employees are eager to quickly acquire new skills to get back to work. Micro-credentialing is emerging as a valuable tool to highlight the competencies that postsecondary institutions can offer (Gauthier, 2020). Varadarajan et al. (2023) examined 60 studies from 2015 to 2022, with the majority originating from the United States, followed by Australia (23%), Europe (13%), and Africa (5%). They found that around 42% of the literature highlighted micro-credentialing as a key factor in sustainable continuous professional development. Of the studies reviewed, about three-quarters indicated that employers

see micro-credentials as crucial for meeting specific job criteria and requirements. Additionally, 50% of the papers discussed the recognition of skills through digital badges. Addressing the skills gap in response to the evolving work landscape was noted in 33% of the articles as a significant opportunity from the employers' perspective.

Micro-credentials can also be used by employers as digital credentials to filter candidates based on the skills required for a position (Devedzic & Jovanovic, 2015). Labour-market trends indicate a growing emphasis on demonstrable skills and competences alongside traditional qualifications. (Kasriel, 2018). Zhang and West (2020) noted that many companies are adopting open micro-credentials for professional micro-learning. IBM's extensive open micro-credential programme, for instance (see https://www.ibm.com/training/mylearning), has issued open micro-credentials to employees and external learners through its online training platform, resulting in higher employee engagement, increased participation in professional development, and improved social media visibility.

Beyond the corporate sector, similar developments are emerging in Europe. The *Europass Digital Credentials for Learning* infrastructure enables institutions to issue verifiable digital credentials aligned with the European Learning Model (European Union, 2014). Additionally, initiatives such as *Micro-Credential Multiverse* within the Velocity Network demonstrate how start-ups and technology consortia are experimenting with blockchain-based credentialing to enhance transparency, portability, and trust in skills recognition across borders (Velocity Network Foundation, 2024).
These examples show hoe businesses and technology networks are shaping the digital credential landscape. At the same time, higher education institutions are becoming equally important actors in ensuring the credibility and wider recognition of micro-credentials. Higher education institutions can leverage their established academic rankings, systems, and policies to lend authenticity and credibility to micro-credentials, making them more appealing to employers. For learners, combining digital badges with their job application portfolios can add significant value during the hiring process (Varadarajan et al., 2023).

2.4. Micro-credentials and lifelong learning

Governments worldwide are grappling with the shifting nature of work and widening skills gaps driven by rapid technological change. Factors such as globalisation, ageing populations, climate change, and advances in Artificial Intelligence (AI) highlight the urgent need for upskilling, reskilling, and adaption to digital and environmental transitions.

Industry 5.0 or Factory 5.0 extend this transformation by placing greater emphasis on human-centric innovation, integrating advanced technologies such as AI-powered robotics with human creativity, resilience, and sustainability. In this context, micro-credentials can serve as agile tools that equip workers with evolving skills needed to thrive in human-technology collaboration and sustainable production environments (European Commission, 2021).

The ongoing economic and technological transitions create both new employment opportunities and the risk of job displacement, underscoring the importance of continuous reskilling. According to the World Economic Forum, by 2025, 50% of all employees will need reskilling due to the dual impacts of

the COVID-19 pandemic and increasing automation due to the rapid development of the use of machine learning.

The McKinsey Global Institute predicts that by 2030, 75 to 375 million workers (3% to 14% of the global workforce) will need to change occupational categories. The Institute for the Future suggests that by 2030, 85% of jobs that today's learners will be doing have not yet been invented. While these predictions can be debated, the consensus is that new technologies will significantly reshape jobs in the coming decade. Consequently, continuous retraining and reskilling are essential to avoid redundancy and economic displacement in local communities.

This evolving landscape necessitates the need for lifelong learning. Traditional macro-degrees are increasingly criticized for their high costs, especially in the United States, their misalignment with job market needs, and their slow adaptation to changing trends. Thus, such qualifications no longer guarantee job security or future-proof careers. Instead, learners require flexible, personalized, on-demand lifelong learning opportunities that equip them with the competences to navigate an increasingly digital society.

In the aftermath of the pandemic and amid new global disruptions such as ongoing wars in Ukraine and Gaza, rising geopolitical tensions, and the spread of extremist ideologies, there is growing recognition that lifelong learning should foster critical thinking, ethical awareness, and human-centred values alongside digital skills. As UNESCO emphasises, lifelong learning must be people-centred and human-rights-based, enabling individuals to develop their capabilities and contribute to more inclusive and resilient societies (UNESCO, 2025). Moreover, lifelong learning plays an important role in building populations that are "resilient, open to change, and willing to engage in learning," which strengthens both social cohesion and democratic participation (UNESCO Institute for Lifelong Learning, 2022)

Micro-credentials promote lifelong learning by allowing learners to create flexible, personalized learning pathways, learn at their own pace, recognize acquired skills, and enhance career prospects. Micro-credentials provide undeniable long-term career value by keeping individuals competitive in the labour market and fostering personal growth. Research indicates that some higher education institutions (HEIs) view micro-credentials as tools for lifelong learning and innovation (Tamoliune et al., 2023).

2.5. MCs landscape in Latvia, Germany, Spain, and Poland

2.5.1. Implementation of MCs in higher education in Latvia

The State Language Centre (SLC) (A. Krastiņš, written consultation of 7 July 2020) translates the term „micro-credential" into Latvian as *„mikrokvalifikācija."* Evidence suggests that micro-credentials in Latvia are offered in the form of continuing education by formal and non-formal education programs. The Law on Institutions of Higher Education in the country defines the role of higher education institutions in ensuring continuing education, i.e., those promote continuing education studies and participate in the activities of continuing education (Section 5). In this context, the law allows higher education institutions and colleges to offer courses or modules outside of their standard study programs, allowing any individual to apply for a course or module in accordance with a procedure estab-

lished by the HEI. In practice, the continuing education opportunities offered by HEIs could be categorized as (i) stand-alone or study modules, often unbundled from study programs, and (ii) formal or non-formal education programs, specially developed and offered additionally to existing offerings of study programs. The procedure for delivering formal education programs for adults is prescribed by the Education Law, Vocational Education Law, Law on Institutions of Higher Education, and other laws and regulations. Non-formal education programs may be organised in different forms, such as courses, conferences, lectures, seminars, or working groups.
As for the current landscape of continuing education in Latvia, out of the 43 HEIs (24 universities and 19 colleges), only one university and 4 colleges reported that they do not provide continuing education.

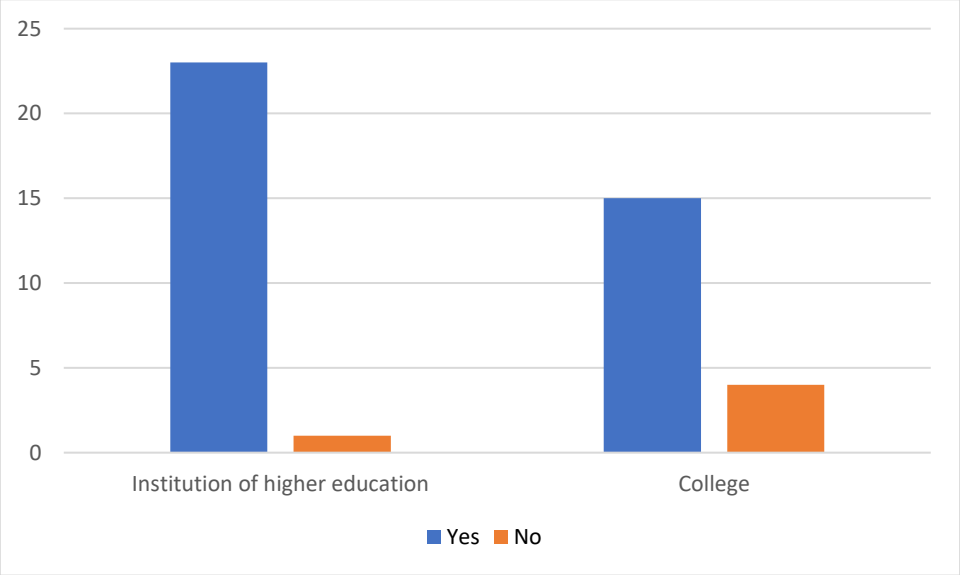

Figure 2. number of HEIs providing continuing education opportunities

In terms of the type of education programme, most HEIs and colleges provide non-formal education opportunities through various programs, including continuing education (offered by 29 HEIs), courses (25), and professional development programs (20). Professional development programs are relatively uncommon, being available at only 9 HEIs, with 7 of these being colleges. Similarly, only a small number of HEIs offer individual modules or sets of modules, with 8 institutions providing these options, 6 of which are institutions of higher education (universities). According to experts interviewed from HEIs, students are allowed to enrol in any courses and modules available through the institution's continuing education offerings. However, no specific courses or modules are particularly emphasized or promoted.

A significant number of HEIs in Latvia create and provide special education programs in response to external requests, with 24 HEIs, 19 of which are universities. Additionally, 16 HEIs offer education programmes aimed at certifying professionals within specific fields. Only 3 HEIs provide training that leads to an international certificate. Also, a small number of universities have adopted the implemen-

tation of MOOCs, with only 3 reporting such initiatives. The HEIs offer both short courses and programmes that are closely linked to their existing study programmes (19 HEIs) and those that are independent of their formal study programmes (15 HEIs).

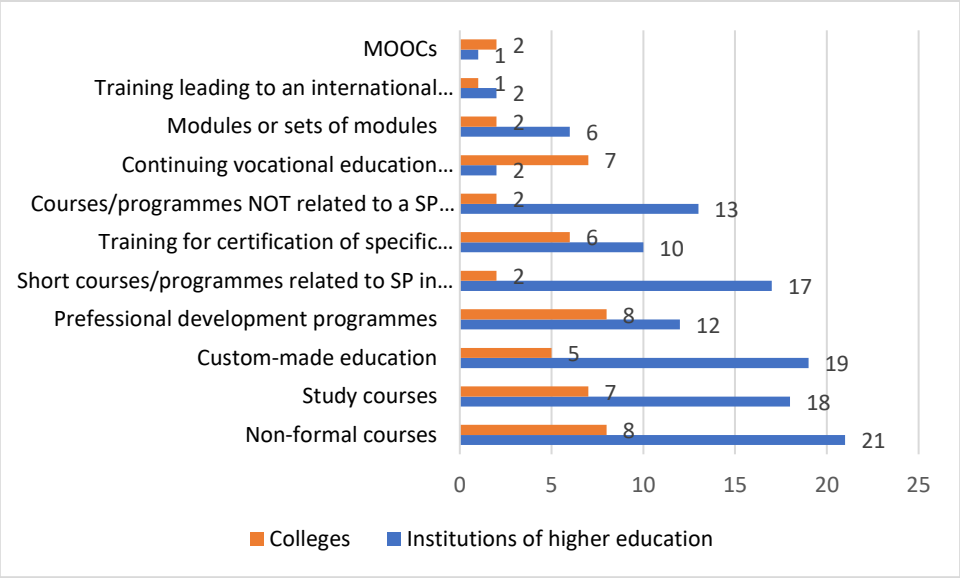

Figure 3. Types of continuing education opportunities provided by HEIs. One educational programme may fit into various types.

The most sought-after courses/programmes offered by the HEIs are professional development programmes for educators, business management, and social sciences. The continuing education opportunities provided by HEIs are detailed in Annex 1, showcasing the wide range of offerings and their alignment with the academic directions pursued by universities and colleges.

Among the examples in Latvia, the short programmes at the Riga Graduate School of Law are most comparable to the micro-credentials available on international MOOC platforms. These short programmes are part of a development collaboration initiative and consist of various courses tailored to fit the needs of the specific programme and its target audience. This includes condensing the curriculum to emphasize essential topics and enhancing the programmes with study visits where applicable. Upon completing these programmes, learners receive a certificate, which can later contribute towards earning a master's degree or be part of the doctoral studies. One of these programs is available online. It is important to note that while the university provides academic degree programmes, it also offers practical, skills-oriented short programmes.

Target group

The most frequently mentioned target groups for continuing education are specific professions, adults, and graduates. Another important target group for higher education institutions is secondary school pupils, who are often offered preparatory courses to enter university. Employers, unemployed individuals, and job seekers are mentioned less frequently.

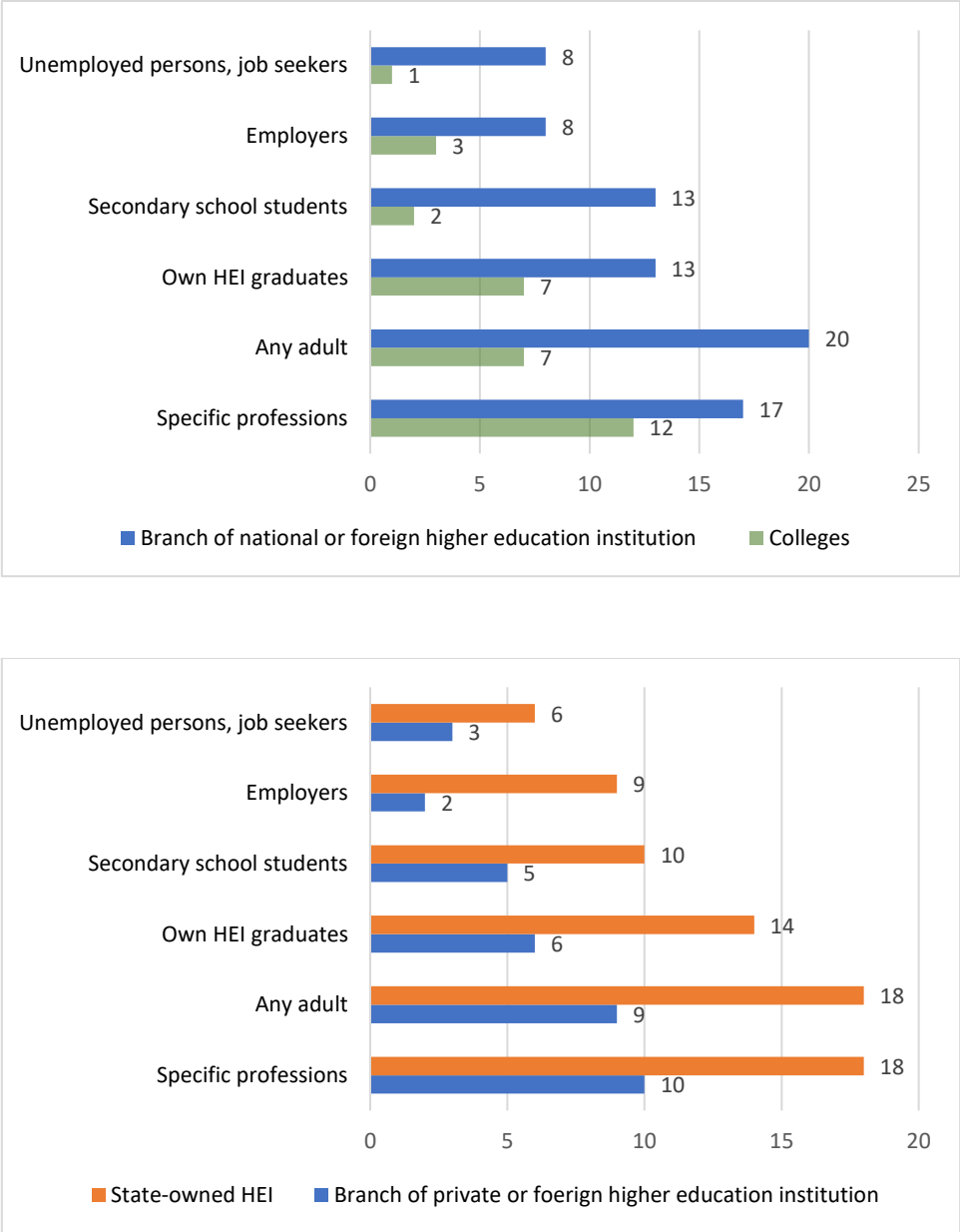

Figure 4. Target groups of continuing education programmes

Delivery mode

The blended delivery mode, which combines both on-site and online formats, is the most popular way for higher education institutions to offer continuing education courses and programs. A smaller number of institutions offer programs exclusively on-site or online.

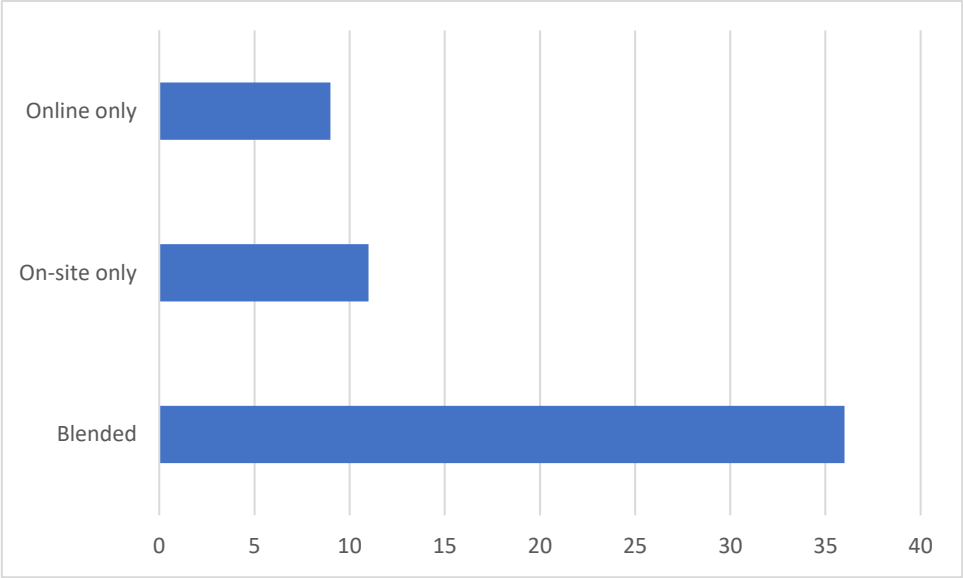

Figure 5. mode of delivering continuing education programmes

Study fees and discounts

Seventeen HEIs offer continuing education courses or programmes free of charge, while 15 HEIs do not. These continuing education programmes include courses provided within the framework of EU-funded and other projects, as well as courses requested by donors or procured by organisations such as the Latvian National Centre for Culture, the Ministry of Culture, and the Ministry of Education and Science (MoES). In some cases, HEIs themselves fund these courses, which are mostly short learning experiences like seminars and lectures. Eighteen HEIs offer various discounts on their courses, while 22 HEIs do not provide any discounts. These discounts may be available to graduates (up to 100%), current students, members of specific professions (e.g., seafarers, educators), teaching staff of the HEI, individuals with disabilities, members of the same family, and employers who are collaboration partners. Discounts may also be offered according to the conditions of the project under which the learning is provided (Lice, 2021).

2.5.2. Implementation of MCs in higher education in Germany

According to the *mmb Learning Delphi* 2021/22 report, 94% of experts surveyed believe that small-scale learning formats will be crucial for companies in German-speaking regions over the next three years (mmb Institut, 2022). Additionally, 77% of those surveyed consider micro-credentials to be a valuable option for self-directed and informal learning. Micro-credentials and micro-degrees offer employees the opportunity to stay current in their field or transition to related fields. These credentials are appealing to both learners and employers because they can be completed quickly and allow for targeted skill development that is closely aligned with specific job roles or industries (Flasdick et al., 2022).

Evidence from the German Academic Exchange Service (DAAD — Deutscher Akademischer Austauschdienst) shows that HEIs are already intensively addressing the potentials and challenges of implementing micro-credentials, both in the context of lifelong learning and in the context of internationalization. In December and January 2022, DAAD, along with European University Networks, conducted and presented the results of two surveys, which reflect the trends in the development and

spread of MCs in German educational system (Figure 5). Among 160 German universities that took part in the first survey by the National Agency for Erasmus+ University Cooperation in the DAAD (NA DAAD), 20% are already using MCs, another 23% are discussing a possible introduction, and for 37% it has not yet been an issue. The second survey gathered information from 34 German universities that are involved in the EU initiative "European University Networks." Around 25% of them are already using MCs, and a further 65% of the universities surveyed are planning to use them as part of European alliances. In both surveys, the universities see the most important area of application for the small learning units, mostly for which there is a fee, as scientific further education and lifelong learning. At the same time, MCs are also becoming more important for internationalization and mobility: in the NA DAAD survey, the majority of all universities surveyed rated the use of MCs as a useful accompanying instrument for internationalisation.

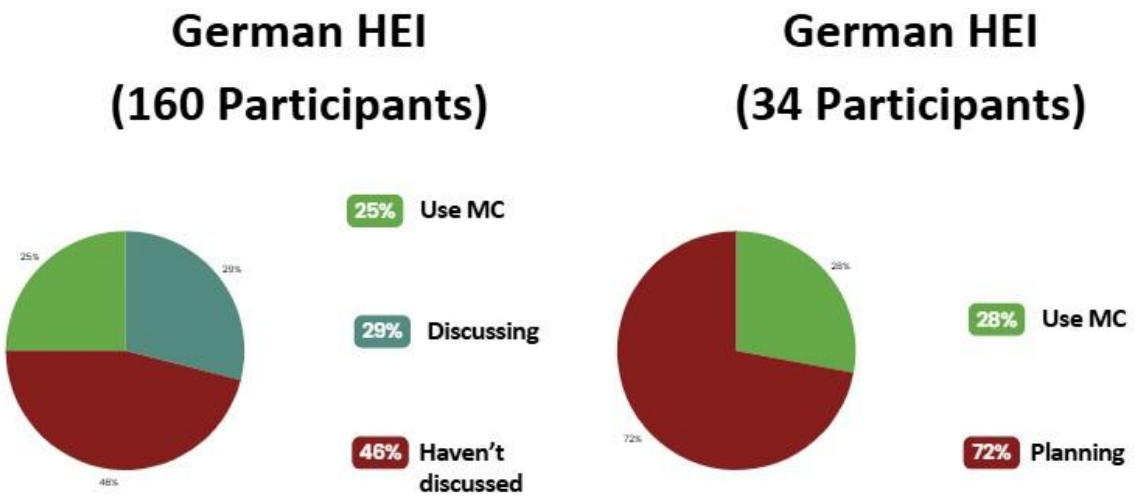

Figure 6. Implementation of MCs in German HEIs

Worth mentioning is that the German Rector's Conference (HRK) fears modularization of degrees, fragmentation of knowledge, and commercial use of micro-parts of conventional degree programs. From the point of view of the German government, there is a general danger that the value of qualifications in all educational sectors could be diluted across all educational sectors (Hippach-Schneider & Le Mouillour, 2022). Despite these concerns, stakeholders such as the German Council of Science and Humanities identified the potentials of micro-credentials in developing Germany's education system, as micro-credentials can supplement holistic study programs, similar to certificate studies and modularized offers within the framework of continuing education HEIs. The Federal Council and four committees agree that MCs and micro-degrees should not weaken or replace initial education, vocational education and training, or traditional qualifications.

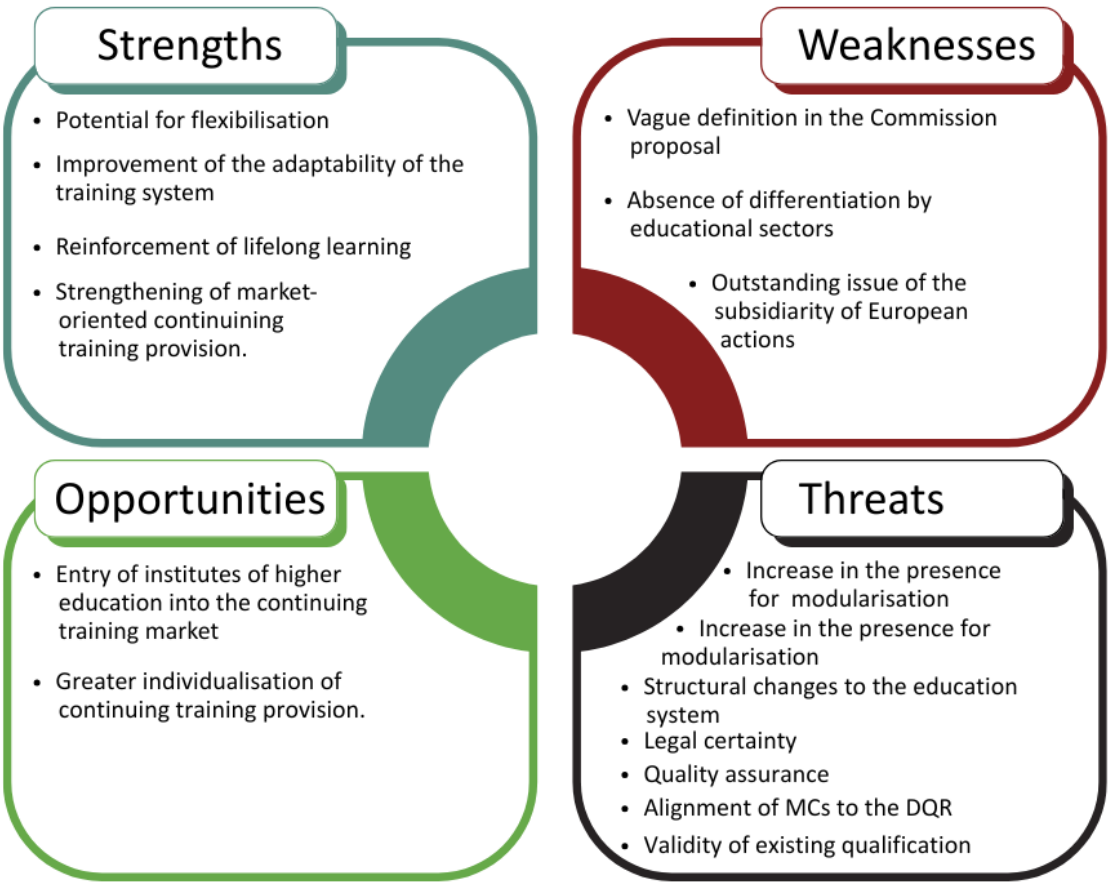

Figure 7. Analysis of the European Commission proposal on micro-credentials for the German education system

Target group

Micro-credentials have the potential to enhance access to higher education, particularly for non-traditional students, including working professionals, international students, and those seeking further education. Micro-credentials serve as valuable entry points to university programs by offering courses that require no prerequisites. Such short learning experiences can facilitate a smoother transition into degree programs, introduce working professionals to academic content and methods, and familiarize international students with the German university system. Additionally, micro-credentials provide supplementary qualifications for lifelong learners.

From a marketing perspective, micro-credentials are effective tools for attracting a diverse range of students, including first-year, international, and professionally qualified students, as well as those interested in continuing education. By offering a low-threshold entry into higher education, universities can demonstrate the potential for these courses to be credited towards full degree programs or other advanced educational opportunities (Hochschulrektorenkonferenz, 2020).

Delivery mode

HEIs in Germany offer micro-credentials through a combination of online, hybrid, and on-site delivery modes. For example, the micro-credential "Managing Technology and Innovation: How to Deal with

Disruptive Change" at RWTH Aachen University is offered online. The Design Thinking course at the Hasso Plattner Institute (HPI), University of Potsdam, is offered in a hybrid mode. Meanwhile, the Sustainable Innovation and Entrepreneurship course at the Technical University of Munich is offered on campus. Notably, these micro-credentials provide flexible learning options, allowing learners to choose between online, hybrid, or on-site modes.

Study fee

The cost structure of micro-credentials varies considerably across higher education institutions. According to the Hochschulrektorenkonferenz (HRK, 2023), many German institutions are obliged under federal state law to charge fees or cost-covering tuition for non-degree programmes, including micro-credentials, particularly when these are offered as part of continuing education or lifelong learning initiatives. In contrast, the Deutscher Akademischer Austauschdienst (DAAD, 2022) reports that a smaller number of institutions offer free participation in micro-credentials to promote access and experimentation with new learning formats.

Some universities have already introduced such offers. For example, the University of Rostock, within the EU-CONEXUS Alliance, provides one-ECTS micro-credentials designed as short online modules available to students of its partner universities (University of Rostock, 2024). The University of Hamburg offers short, mostly digital micro-credentials aimed at developing so-called “future skills” relevant to the labour market (University of Hamburg, 2024). The Technical University of Munich, through its participation in the EuroTeQ University Alliance, also provides micro-credentials for professional learners and notes that “for professional participants, costs may apply” (EuroTeQ Engineering University, 2024). While the exact fees differ across institutions, this variation reflects the evolving and experimental nature of micro-credential provision in Germany.

Micro-credentials developed within European Union-funded or nationally supported initiative are typically offered free of charge to participants. By contrast, micro-credentials developed independently by higher education institutions, particularly within continuing education frameworks, often involve modest fees, usually limited to certificate issuance or cost recovery. This variation indicates that cost structures are shaped by the funding model, institutional objectives, and the intended target group of learners

2.5.3. Implementation of MCs in higher education in Spain

Micro-credentials (MCs) are gradually being integrated into higher education in Spain through coordinated national and regional initiatives. HEIs in Spain offer micro-credentials on a limited scale, often as Short Learning Programmes (SLPs) designed to bridge the gap between education and vocational training, thereby promoting lifelong learning and employability. The National Agency for Quality Assessment and Accreditation (ANECA, 2022) has developed a quality assurance (QA) framework for SLPs and recognition of SLPs and micro-credentials that applies to both on-site, online, and blended learning. This framework provides universities with guidance on maintaining academic standards, evaluating student learning outcomes, and ensuring institutional accountability across teaching modalities.

The ANECA framework emphasises the need for flexible QA tools, robust internal QA mechanisms, the involvement of qualified academic staff, transparent assessment systems, and proper student identification. It also requires clear allocation of European Credit Transfer and Accumulation System (ECTS) credits, alignment with the National Qualifications Framework (MECES), and identification of the awarding body and registration procedures for credentials and student data (ANECA, 2022).

A major milestone was achieved with the publication of Royal Decree 822/2021, which formally recognised micro-credentials as part of the national system of lifelong learning. The decree authorises universities to offer short-term learning opportunities, including "micro-credentials, micro-modules, or other short programmes," and establishes an upper limit of 15 ECTS for each course (Government of Spain, 2021). This legal recognition provided the structural foundation for integrating MCs into the Spanish higher education system.

To operationalise this policy, the Ministry of Universities launched the Microcreds Plan within the Recovery, Transformation and Resilience Plan. The initiative allocated €50 million to Spanish universities for the design and delivery of micro-credentials and for supporting unemployed or socially vulnerable individuals. The programme also promotes collaboration between universities and productive sectors to ensure that the new credentials respond to labour-market and upskilling needs (CEDEFOP, 2022).

At the regional level, the Catalan Government established the *MicroCredCAT* Plan to coordinate universities, business associations, and employment agencies in co-designing micro-credentials aimed at re-skilling and up-skilling adult learners. Collaboration between universities and external stakeholders has become an important characteristic of Spain's micro-credential ecosystem. The Universitat Autònoma de Barcelona (UAB) and Mondragon Unibertsitatea lead the Spanish Network of European Alliances Working Group on Micro-credentials, while business organisations such as PIMEC and NGOs such as the ABD Group have partnered with universities to co-create sector-specific micro-credentials, such as a social-services management credential developed by UAB and ABD Group.

ANECA's national study on quality assurance in European university alliances and MCs found that only 12% of Spanish universities award micro-credentials, equally divided between those offering them as modules within official programmes and those providing stand-alone training. Another 69% reported that they are developing strategies for future implementation, while 19 percent indicated that they have no current plans to introduce micro-credentials (ANECA, 2022). Despite these early stages, the survey shows growing institutional awareness and strategic interest in MCs as tools for lifelong learning and employability.

Micro-credentials implementation in Spain suggest an emerging yet dynamic area of policy and practice. National legislation, dedicated public funding, and regional collaborations have developed a clear framework for implementation, while universities, governments, and social partners are actively shaping new learning opportunities that connect higher education more closely with the needs of society and the labour market.

Target group

Micro-credentials are relevant to many different stakeholders with potential benefits for learners, employees, employers, HEIs, trade unions and professional bodies, quality assurance agencies, and

governments (Brown et al., 2021). Micro-credentials in Spain target a diverse range of learners beyond traditional students. According to a CEDEFOP case study, they are designed to support adult learners, both employed and unemployed, who seek up-skilling or re-skilling opportunities (Evira, 2023). Public university pilots in Spain indicate participation by working professionals, lifelong learners, and international students (UPV, 2025). In addition, programmes funded under the Recovery, Transformation and Resilience Plan aim to include individuals aged 25-64, especially those from socio-economically disadvantaged backgrounds or changing careers (UPV, 2025). Thus, HEIs in Spain are moving away from solely full-time undergraduate cohorts and increasingly emphasising flexible credentials for non-traditional learners, including mature entrants, professionals, and adult learners.

Delivery mode

Micro-credentials are delivered in various modalities to match learner needs and circumstances. Spanish HEIs offer short learning programmes (SLPs) that span on-campus, blended and fully online formats under QA guidance from ANECA (ANECA, 2022). Cases analysed by the OECD show that public authorities deliberately favour modular, often digital delivery to widen access and respond to workforce demands (OECD, 2023). For example, micro-credentials funded by national initiatives allow online participation and reduce geographical barriers (UPV, 2025). These flexible delivery modes enable learners to engage part-time, alongside employment or family responsibilities, reinforcing the lifelong-learning orientation of the Spanish MC ecosystem.

Study fee

In Spain, the cost structure of micro-credentials varies based on funding models and programme design. Publicly funded pilots, especially those backed by EU structural instruments, often waive tuition fees or cover much of the learner cost; the OECD reports micro-credential pilot funding sometimes reduces or exempts fees for disadvantaged learners (OECD, 2023). Conversely, institutions offering micro-credentials within continuing education streams may charge moderate fees, especially for certification or cost-recovery purposes (Evira, 2023). For example, some universities in Spain offer micro-credentials under national grants that cover development costs, leaving the learner only a nominal fee or none at all (UPV, 2025).

2.5.4. Implementation of MCs in higher education in Poland

Micro-credentials in Poland is still emerging but has gained visibility since 2021 through a combination of pilot projects, national strategies, and European alignment efforts. Universities remain central actors in this process, supported by the Ministry of Science and Higher Education (MEiN) and the Educational Research Institute (IBE), which coordinates national initiatives to standardise micro-credential design and validation (Stasiowski, 2023).

A key milestone was the launch of the Odznaka+ (Badge+) platform, developed under the IBE's "Micro-credentials for Poland" project, which enables universities to issue digital credentials aligned with the European Open Badges standard. In 2023, Opole University of Technology became the first Polish higher-education institution to issue micro-credentials through Odznaka+ (microcredentials.pl, 2025a). Building on this pilot, IBE established the Polish Micro-credentials Advisory Group in 2024 to develop a national framework consistent with the EU Council Recommendation on a European Approach to Micro-credentials (microcredentials.pl, 2024).

Universities provide courses through their MOOC (Massive Open Online Course) platforms. These online courses serve as a complement to their in-person educational offerings and are delivered either independently or as part of blended or hybrid learning models. Additionally, national platforms such as Navoica, along with offerings from institutions like the European University and the Open University of Warsaw, provide various online learning opportunities. Examples of these platforms are outlined in Table 2.

Table 2. MOOC platforms of HEIs in Poland

Platform	Institution	Description
Open University of the University of Warsaw	University of Warsaw	Established in 2008, a precursor and a leader in the lifelong learning sector in Poland. It provides stationary, online, and hybrid courses conducted by university lecturers on various topics. Learners outside the university pay small fees for participation in courses. Courses typically take 30-40 hours. After completing the training, each participant receives a diploma of participation. In some cases, UOUW offers a certificate printed by Polish Security Printing Works.
OKNO – Distance Education Centre	Warsaw University of Technology	Provides non-stationary bachelor's or master's degree studies via Internet, based on the SPRINT model (blended learning).
e-SGH	Warsaw School of Economics	E-learning platform providing courses and materials for students enrolled in regular studying programmes.
Copernicus College	Copernicus Centre for Interdisciplinary Studies of the Jagiellonian University	MOOC platform established in 2014 by Copernicus Centre for Interdisciplinary Studies. It provides free online courses conducted by Polish scientists. Currently, it has 45 courses and 26000 users.

NAVOICA	Ministry of Science and Higher Education	It is a platform for free online courses to be provided by different Polish academic institutions and universities. Currently, it offers 82 courses. Mainly in the areas of IT and social sciences.
Kozminski University	Kozminski University	Kozminski University, a private university based in Warsaw, has a broad range of education programs in management, finance, economics, law, and other related fields, including short, online or stationary, courses.

Source: Stasiowski (2023)

At the policy level, micro-credentials are linked to the *Integrated Skills Strategy 2030*, the national policy for skills development and a strategic framework for promoting social and economic development through lifelong learning. The strategy aims to enhance social capital, inclusion, and economic growth by fostering skills across formal education, non-formal learning and the workplace. Universities such as the University of Warsaw, Kozminski University, and the Warsaw University of Technology already offer short learning programmes and MOOCs that award verifiable digital certificates, many hosted on the NAVOICA national platform (Stasiowski, 2023; Urbanik, 2022).

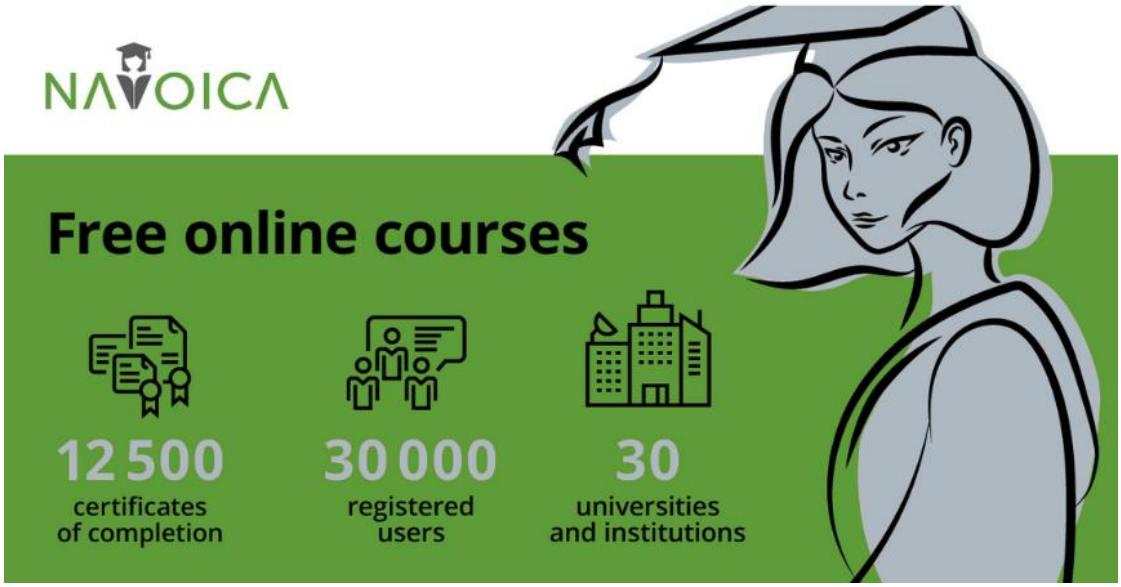

Figure 8. NAVOICA, the Polish MOOC Platform
Source: OPI PIB (https://opi.org.pl/en/navoica-the-polish-mooc-of-education/)

Although micro-credentials remain in an early development phase, coordinated institutional, governmental, and technological initiatives in Poland provide a strong foundation for their future integration into the national higher-education and labour-market systems.

Target group

Micro-credentials in Poland primarily serve adults engaged in lifelong learning, professionals seeking upskilling or reskilling, and employees pursuing career advancement or retraining. Data from the Study of Human Capital indicate that 27 % of adults aged 25–64 participated in formal or non-formal education during a four-week period, with most learning linked to their professional activities (Górniak et al., 2020). The Adult Education Survey (Statistics Poland, 2018) similarly shows that 46 % of adults aged 18–69 took part in some educational activity, and for 78 % of those in non-formal education, training was work-related. The main users of micro-credentials are employees in ICT, education, and financial sectors, fields where continuous professional development is essential due to technological change or regulatory updates (Stasiowski, 2023). Teachers also represent a large share of learners, as Poland's education law ties professional promotion to certified training participation (Statistics Poland, 2018).

Delivery mode

HEIs in Poland deliver micro-credentials through a mix of on-site, blended, and online formats. Universities operate national MOOC platforms such as NAVOICA, Copernicus College, and the Open University of Warsaw, which together host more than 100 courses, mainly in ICT and social sciences. These courses are often short, typically lasting 20 to 40 hours, and provide certificates of participation or digital badges validated through the Odznaka+ platform developed under the Badge+ project of the Educational Research Institute (IBE). The integration of micro-credentials into higher education is further supported by national initiatives such as NAWA's SPINAKER programme and the ENHANCE Alliance, which promote short online courses for international students (Stasiowski, 2023). Increasingly, micro-credentials are embedded in hybrid learning models that combine academic and labour-market relevance, aligning with the objectives of the Integrated Skills Strategy 2030.

Study fee

The cost of micro-credentials in Poland varies according to provider type and funding source. Courses delivered through publicly funded initiatives, such as those financed by the Polish Agency for Enterprise Development (PARP) via the Database of Development Services (BUR), are often free for participants or co-funded through EU programmes (Stasiowski, 2023). Similarly, MOOCs hosted on NAVOICA or Copernicus College are open and free of charge, while private universities such as Kozminski University charge moderate fees to cover instruction and certification.

3. Academic recognition and portability of micro-credentials

Recognition of micro-credentials

Academic recognition of micro-credentials refers to the process by which educational institutions, particularly HEIs, acknowledge and validate the learning achievements and competencies demonstrated through micro-credentials. The Council Recommendation on promoting automatic mutual recognition aims to simplify the recognition process of higher education, upper secondary education, and training qualifications across EU Member States by encouraging automatic recognition of qualifications and study periods abroad, without the need for separate procedures (Council of the European Union, 2018). This framework complements the Lisbon Recognition Convention (UNESCO, 1997), which requires that degrees, diplomas, or certificates issued by competent authorities issued in one state to be recognized in another for the purposes of further study or employment, unless substantial differences can be demonstrated.

In the academic recognition process, the key actors include ENIC/NARIC centres (European Network of Information Centres and National Academic Recognition Information Centres in the European Union), national ministries, and HEIs, whose processes are guided by the Lisbon Recognition Convention (ENIC-NARIC, 2023). Recognition of e-learning and digital credentials has been specifically addressed by the e-Valuate Project, which recommends seven criteria for recognizing digital micro-credentials:

- Quality of the course/module;
- Authenticity of the credential (verification of the certificate);
- Level of the course;
- Learning outcomes;
- Workload;
- Ways of assessment:
- Identification of the learner.

These criteria contribute to transparency in the recognition process, as they make the quality, level, and learning outcomes of the credential clear to all parties involved. Such transparency is fundamental for recognition because it builds the trust necessary for making fair recognition decisions. When the transparency of the credential design and assessment is ensured, micro-credentials are more likely to be recognized across institutions and borders (Council of the European Union, 2022).

In inter-institutional contexts, micro-credentials can be more easily or even automatically recognized within "trusted partnerships" where HEIs have already established working relationships. Academic recognition of micro-credentials can support alternative routes to higher education, grant exemptions toward degree programmes, and enable stackability, the process by which multiple smaller learning units or micro-credentials can be accumulated to build a larger qualification such as a degree. Nevertheless, evidence from the MicroHE study shows that learners seeking exemptions based on recognition of studies outside traditional curricula may encounter challenges due to a lack of a common definition of micro-credentials, differences in assessment standards, and institutional procedures (Sood et al., 2020).

In 2020, the European Commission established an Ad-hoc Consultation Group on Micro-credentials to propose a shared definition and roadmap for developing and recognizing micro-credentials across the European Higher Education Area (European Commission, 2020). The group identified the recognition of prior learning and experience (RPL) as one of the most relevant mechanisms for validating non-formal and informal learning. However, RPL practices differ widely among higher education institutions and across EU Member States. According to CEDEFOP (2018), 18 EU Member States allow the award of full formal qualifications through RPL procedures, while 19 permit partial qualifications.

Despite growing awareness of micro-credentials, learning-outcome-based validation remains unevenly implemented. CEDEFOP (2023) reports that variations in institutional trust, recognition procedures, and the interpretation of learning outcomes continue to hinder consistent validation across Europe. These challenges are often linked to differing quality assurance requirements and the absence of a unified European credit transfer system for short learning units. As a result, recognition of prior learning and experience still occurs on a case-by-case basis, with substantial variation in available funding, administrative burden, and institutional commitment among Member States.

From an employment perspective, awareness of micro-credentials also varies. Studies conducted within the MicroHE Project indicate that while employers value the verified skills micro-credentials represent, they often remain uncertain about their standing within national qualification frameworks or their equivalence to traditional degrees (MicroHE Consortium, 2019). The lack of clarity about the recognition of micro-credentials in the labour market suggest the need for continued coordination between policymakers, education providers, and employers to build trust and enhance of micro-credentials across Europe.

Recognition processes supported by digital means are an emerging field of research and practice. The EMREX Network and its related initiatives provide a foundation for user-centred recognition systems by enabling the secure electronic transfer of verified student achievement data between institutions (EMREX, 2019). Complimentary initiatives include the Europass Digital Credentials Infrastructure (EDCI) and the European Student Card Initiative, particularly the Erasmus Without Paper Network, coordinated by the European University Foundation. This network facilitates the fully digitalised exchange and management of student mobility data, including course results, credit allocations, and verified learning outcomes between HEIs participating in mobility programmes (European University Foundation, 2019; European Commission, 2020)

Additionally, the DigiRec Project, developed by NARIC centres, provides valuable insights into the potential of digitalizing parts of the recognition process by exploring how digitalizing student data and evaluation processes can support recognition (NUFFIC, 2020a). While digitalization offers benefits such as increased efficiency, consistency, and better data quality, it also requires the active involvement of stakeholders at both institutional and national levels and to train staff in higher education institutions and within the ENIC-NARIC network in using digital solutions. In particular, staff training within HEI and the ENIC-NARIC network is important to ensure the digital tools are implemented effectively and ethically. In some cases, adapting regulations may be necessary to permit the exchange and storage of digital data in compliance with the national and EU data protection standards (NUFFIC, 2020b).

The European Credit Clearinghouse for Opening up Education (ECCOE) Project further contributes to this agenda by proposing a standardised Learning Passport modelled on the Diploma Supplement and Annex VI of the European Qualification Framework. This initiative seeks to improve cross-border credit transfer and recognition of micro-learning by creating interoperable digital credential formats. For credit mobility, Erasmus Learning Agreements provide a template for recognition processes between HEIs (ECCOE, 2019).

Portability of micro-credentials

Micro-credentials are portable when credential holders (learners) can easily store and share their credentials through secure digital wallets, such as Europass (https://europass.europa.eu/en), in compliance with the General Data Protection Regulation (Europass European Union, 2014). The infrastructure for storing these credentials is based on open standards and data models, ensuring interoperability and seamless data exchange. This approach also facilitates smooth verification of data authenticity (European Commission, 2021).

The European Commission recognizes the importance of adopting digital formats for micro-credentials to enhance their storage, sharing, and portability, benefiting learners, educational institutions, and employers. Europass plays a crucial role in supporting lifelong learning at all levels and enables the stacking of credentials accumulated over time and from various institutions. It is built on a unified data model that can describe all forms of learning outcomes, including micro-credentials (Open badge network, 2016). This approach helps address barriers identified by stakeholders. Several emerging digital solutions, such as blockchain technology and digital badges, facilitate the digital storage, portability, sharing, and exchange of micro-credentials. Blockchain technology allows for secure portability, sharing, exchange, and verification of credentials, ensuring learners' ownership of their data without third-party control.

Universities in Germany, the Netherlands, and Italy have adopted the Blockcerts standard, initially designed by MIT Media Lab. In Italy, universities have started notarizing degrees on a public blockchain using the Blockcerts standard, in a solution known as BESTR (Cherubini, 2019). Blockcerts enables universities to issue digital certificates signed with their own digital keys, ensuring that the digital certificate is notarized in the blockchain and owned by the individual. The ENIC-NARIC Centre in Italy launched "Diplome" in April 2019, the first application of blockchain technology to the recognition of qualifications (European Commission, 2020).

3.1. European qualification framework

The diversity of European education and training systems is a result of different national traditions, which poses a challenge in evaluating the knowledge, understanding, and capabilities of individuals holding qualifications from different countries, particularly in academic and work contexts. This discrepancy in qualifications could give rise to mistrust, potentially impeding professional growth, limiting job prospects, and hindering access to further education. Ultimately, this may hinder mobility within the EU, both within and across borders (Council of the European Union, 2018).

To enhance transparency and permeability of qualifications across Europe, the EU developed the European Qualification Framework (EQF) in 2008 and revised it in 2017. The EQF serves as a standardized reference framework, which facilitates the transparency, comparison, and understanding of

qualifications from different countries and institutions through a learning outcomes-based approach. The EQF facilitates the movement of learners and workers across borders, promoting lifelong learning and career advancement throughout Europe. The learning outcomes approach utilized by the EQF aims to better match labour market skill needs with education and training provisions while validating learning attained in various settings.

After the EQF entered the adoption process, EU member states began creating their NQFs according to the EQF's guidelines, even though they were not legally binding. As of the close of 2015, a total of 39 European countries had either set up or were in the process of setting up an NQF (Mikulec, 2017).

As earlier mentioned, the EQF is fully operational and closely linked to national qualifications frameworks, providing a comprehensive map of all types and levels of qualifications in Europe. EU member states, as well as non-EU states, continue to demonstrate their commitment to further developing the EQF to make it more effective in facilitating the understanding of national, international, and third-country qualifications by employers, workers, and learners (European Commission, 2018).

The primary goal of the qualification framework is to organize and harmonize qualifications, thereby enhancing their transparency, accessibility, and quality in connection to the labour market, educational and training systems, and society at large. By supporting lifelong learning, which encompasses all learning activities undertaken throughout a person's life, qualifications frameworks aim to improve an individual's knowledge, skills, and competencies from personal, civic, social, and employment perspectives. This definition includes all forms of learning such as formal, non-formal, and informal (European Commission, 2018).

In Europe, two distinct qualifications frameworks coexist, each serving a unique purpose: the European Qualifications Framework (EQF) for Lifelong Learning, revised in 2017, and the Overarching Framework of Qualifications of the European Higher Education Area (QF-EHEA) (Bologna Working Group, 2005; European Commission, 2020). These frameworks are designed to be fully compatible with one another and have facilitated the development of mutual trust zones. They act as translation tools to make national qualifications more comprehensible and comparable (Young & Allais, 2013).

The EQF, along with all National Qualifications Frameworks (NQFs) aligned with it, adopts a learning outcomes approach. This means that both the content and level of a qualification reflect what holders are expected to know, understand, and be able to do, known as learning outcomes (European Commission, 2018). The EQF functions as a reference framework for qualifications, featuring level descriptors for learning outcomes that are applicable to all qualification levels. Consequently, it offers a potential foundation for incorporating micro-credentials into national qualification frameworks, should EU member states choose to do so.

The EQF's learning outcome descriptors are organised along two dimensions. The first dimension is referred to as 'levels,' which consist of eight distinct levels. The second dimension is known as 'learning domains'. The 'level' dimension captures the increasing complexity of learning outcomes as qualification levels advance. For example, the autonomy expected from a level 1 qualification holder is significantly less than that expected from a level 8 holder. The 'learning domains' dimension distinguishes between 'knowledge,' 'skills,' and 'autonomy and responsibility,' which allows different types of qualifications to be classified at the same level (see fig 7 & 8).

A challenge in referencing a micro-credential to a qualification level is that the same set of learning outcomes can be expressed at different qualification levels, depending on the thematic area in which they are taught. For instance, 'Introductory Japanese' may be taught at level 7 in an International Logistics program but at level 3 in a Japanese language course. Although the learning outcomes for the two courses are identical, they are assigned different qualification levels due to the context of the course. While qualifications frameworks can describe learning outcomes, they may require contextualization by referring to the credential's thematic area. Using ISCED fields can help establish a universal measure for learning outcomes (Camilleri, 2018).

Table 3. The EQF dimensions: knowledge, skills, and competence

Each of the 8 levels is defined by a set of descriptors indicating to qualifications at that level in any system of qualifications.		KNOWLEDGE In the context of EQF, knowledge is described as theoretical and/or factual	SKILLS In the context of EQF, skills are described as cognitive (involving the use of logical, intuitive and creative thinking) and practical (involving manual dexterity and the use of methods, materials, tools and instruments)	COMPETENCE In the context of EQF, competence is described in terms of responsibility and autonomy
LEVEL 1	The learning outcomes relevant to Level 1 are	Basic general knowledge	Basic skills required to carry out simple tasks	Work or study under direct supervision in a structured context
LEVEL 2	The learning outcomes relevant to Level 2 are	Basic factual knowledge of a field of work or study	Basic cognitive and practical skills required to use relevant information in order to carry out tasks and to solve routine problems using simple rules and tools	Work or study under supervision with some autonomy
LEVEL 3	The learning outcomes relevant to Level 3 are	Knowledge of facts, principles, processes and general concepts in a field of work or study	A range of cognitive and practical skills required to accomplish tasks and solve problems by selecting any applying basic methods, tools, materials and information	- Take responsibility for completion of tasks in work or study - Adapt own behaviour to circumstances in solving problems
LEVEL 4	The learning outcomes relevant to Level 4 are	Factual and theoretical knowledge in broad contexts within a field of work or study	A range of cognitive and practical skills required to generate solutions to specific problems in a field of work or study	- Exercise self-management within the guidelines of work or study contexts that are usually

				predictable, but subject to change. - Supervise the routine work of others, taking some responsibility for the evaluation and improvement of work or study activities.
LEVEL 5	The learning outcomes relevant to Level 5 are	Comprehensive, specialised, factual and theoretical knowledge within a field of work or study and an awareness of the boundaries of that knowledge	A comprehensive range of cognitive and practical skills required to develop creative solutions to abstract problems	- Exercise management and supervision in contexts of work or study activities where there is unpredictable change. - Review and develop performance pf self and others.
LEVEL 6	The learning outcomes relevant to Level 6 are	Advanced knowledge of a field of work or study, involving a critical understanding of theories and principles	Advanced skills demonstrating mastery and innovation, required to solve complex and unpredictable problems in a specialised field of work or study	- Manage complex technical or professional activities or projects, taking responsibly for decision-making in unpredictable work or study contexts. - Take responsibility for managing professional development of individuals and groups
LEVEL 7	The learning outcomes relevant to Level76 are	- Highly specialised knowledge, some of which is at the forefront of knowledge in a field of work or study, as the basis for original thinking and/or research.	Specialised problem-solving skills required in research and/or innovation in order to develop new knowledge and procedures and to integrate knowledge from different platforms.	- Manage and transform work or study contexts that are complex, unpredictable and require strategic approaches. - Take responsibility for contributing to professional knowledge

		- Critical awareness of knowledge issues in a field and at the interface between different fields.		and practice and/or for reviewing the strategic performance of teams.
LEVEL 8	The learning outcomes relevant to Level 8 are	Knowledge at the most advanced frontier of a field of work or study and at the interface between fields	The most advanced and specialised skills and techniques, including synthesis and evaluation, required to solve critical problems in research and/or innovation and to extend and redefine existing knowledge or professional practice	Demonstrate substantial authority, innovation, autonomy, scholarly and professional integrity and sustained commitment to the development of new ideas or processed at the forefront of work or study contexts including research

The European MOOC Consortium, which includes FutureLearn (UK), FUN (France), MiríadaX (Spain and IberoAmerica), EduOpen (Italy), ImooX (Austria), and OpenupED/the European Association of Distance Teaching Universities (EADTU), has developed the Common Micro-credential Framework (CMF). Mentioned framework is designed to facilitate the seamless recognition of micro-credentials towards formal qualifications. The consortium represents the majority of MOOC development in Europe, both in terms of the number of learners and the total number of MOOCs offered. Collectively, they provide over 3,000 MOOCs and comprise a vast network of 400 HEIs and companies. These institutions operate in multiple European languages, including English, French, Spanish, Italian, German, and Portuguese.

According to the CMF, micro-credentials should be designed to align with levels 6-8 of the EQF, which correspond to bachelor's, master's, and doctoral levels. There is also an option to include level 5 micro-credentials in combination with the European Credit Transfer and Accumulation System (ECTS) (Antonaci et al., 2021).

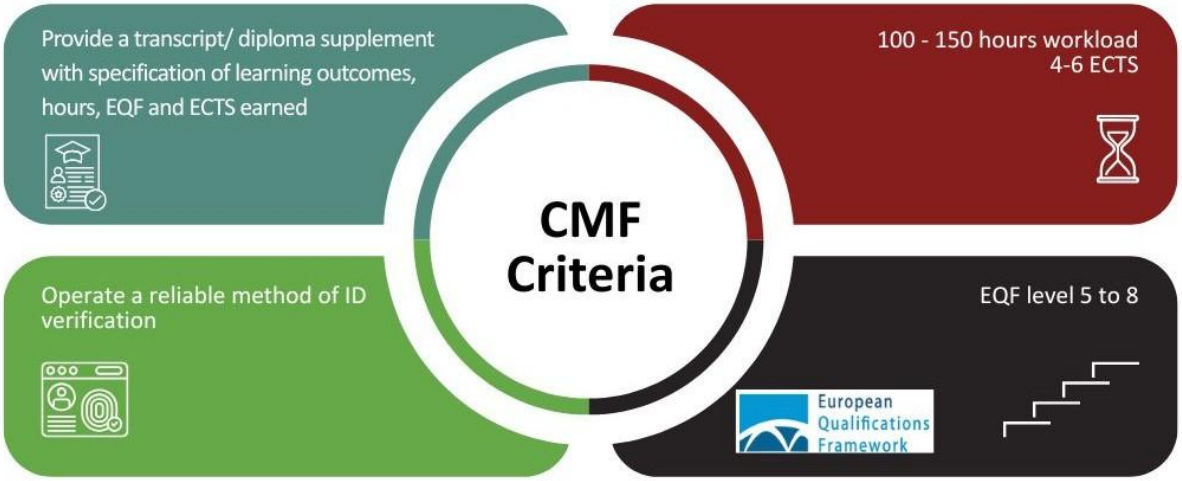

Figure 9. The CMF Criteria
Source: Antonaci et al. (2021)

3.2. National qualification frameworks

3.2.1. MCs and the National Qualification Framework in Latvia

The Latvian Qualifications Framework (LQF) is a national referencing system that categorizes all qualifications within the Latvian education system into levels. This framework was developed by adapting the European Qualifications Framework (EQF) to align with Latvia's educational traditions and stakeholder needs. The general regulations governing the LQF are established in the Education Law of 1998, as amended on June 18, 2015 (effective from July 16, 2015) (Gencs Valters, 2016). The LQF consists of eight levels that cover all education levels, including basic, secondary, and higher education, as well as various types of education, such as general, vocational (professional), and academic education. It also includes professional qualifications obtained outside the formal education system. Additionally, the LQF is aligned with the EQF.

Each level within the LQF is defined by specific learning outcomes, which include the knowledge, skills, and competencies acquired at previous levels. The Vocational Education Law of 1999, amended on March 3, 2022, effective August 1, 2022, stipulates that professional qualification levels correspond to the respective LQF levels. The Cabinet of Ministers Regulations No. 322, initially amended on October 9, 2010, and most recently on June 13, 2017 (effective June 16, 2017), provide detailed descriptions of the knowledge, skills, and competencies required for each LQF level and ensure that educational programs align with the LQF/EQF levels.

The LQF level descriptors are based on learning outcomes that are expressed in three dimensions:

- Knowledge (knowledge and comprehension);
- Skills (ability to apply knowledge, communication, general skills);
- Competence (analysis, synthesis, and assessment) (ACI-NCP, 2022).

Table 4. Certificates of Latvian formal education and their corresponding LQF levels

Education documents	LQF Level
Certificate of general basic education (special education programmes for learners with severe mental development disorders or multiple severe development disorders)	1
Certificate of general basic education Certificate of vocational basic education Certificate of professional qualification (at basic education level)	2
Certificate of vocational education (arodizglitiba) Certificate of professional qualification (at vocational education (arodizglitiba) level)	3
Certificate of general secondary education Diploma of vocational secondary education Certificate of professional qualification (at secondary level)	4
Diploma of first level professional higher education (college education, length of full-time studies: 2 to 3 years)	5
Bachelor's diploma Professional Bachelor's diploma Diploma of professional higher education, diploma of higher professional qualification (length of full-time studies: at least 4 years)	6
Master's diploma Professional Master's diploma Diploma of professional higher education, diploma of higher professional qualification (total length of full-time studies: at least 5 years).	7
Doctor's diploma Professional Doctor's in Arts	8

Over the past decade, the Latvian Qualifications Framework (LQF) has been aligned with the European Qualifications Framework (EQF) and has significantly impacted the education system and labour

market in Latvia. This alignment has strengthened the focus on learning outcomes, making curriculum more transparent and comparable for educators, employers, international partners, and the general public (Academic Information Centre, 2017). Qualifications are now included in higher education diploma supplements and all state-recognized documents that certify vocational education and qualifications (CEDEFOP, 2021).

A national survey conducted by the Academic Information Centre-Latvian National Coordination Point for the EQF revealed that public and employer awareness of the LQF is relatively, with many associating it primarily with the recognition of foreign diplomas and qualifications. Nevertheless, respondents from HEIs and employers familiar with the LQF noted its significant impact on developing educational programs. During interviews, respondents emphasized the LQF's crucial role in designing and implementing outcome-based education (Lice, 2021). Linking micro-credentials to the LQF could therefore enhance their formal recognition in both education and the labour market.

Despite this, some HEI experts questioned whether associating micro-credentials with the LQF adds any real value. Meanwhile, experts in vocational education noted that the LQF levels are already specified in sample modular vocational secondary education programs and should also be indicated for specific vocational qualification components. They mentioned plans to update professional standards or vocational qualification requirements to include these components, which should be coordinated with the relevant sectors for outreach purposes instead of being formally approved by the Professional Education and Employment Tripartite Cooperation Sub-Council (PINTSA) and the Cabinet of Ministers, as this would be excessively burdensome.

3.2.2. Micro-credentials and the National Qualification Framework in Germany

The NQF of Germany, otherwise known as the German Qualification Framework (DQR), is a comprehensive system that provides a structured framework for the recognition, assessment, and certification of qualifications across various education and training sectors. It was officially launched in May 2013 by the joint resolution of the Standing Conference of the Ministers for Education and Cultural Affairs of the Länder, the Federal Ministry of Education and Research (BMBF), the Conference of Ministers for Economics of the Länder, and the Federal Ministry of Economics and Technology.

The DQR was the first framework to consider all qualifications of the German education system across all educational sectors (Eurydice, 2023). The framework is an alignment instrument for facilitating orientation of qualifications in the German educational system and the comparability of German qualifications in Europe (BIBB, 2015). It seeks to aid lifelong learning and the development of a skilled workforce, as well as the validation of non-formal and informal learning, by serving as a guiding tool in the identification and evaluation of skills during the validation process (UNESCO-UNEVOC, 2022). More specifically, the DQR aims to:

- enhance transparency in German qualifications and aid their recognition all over Europe;
- facilitate the mobility of learners and workers between Germany and other European countries, as well as within Germany;
- promote the clarity and comparability of qualifications to facilitate their recognition and mobility;
- foster trustworthiness, facilitate transferability, and ensure quality assurance;
- increase the focus on skill development in qualifications;

- strengthen the focus on learning outcomes in the qualification process;
- enhance validation and recognition opportunities for non-formal and informal learning pathways;
- improve lifelong learning by facilitating access and increasing participation (CEDEFOP, 2021).

The DQR provides a framework for describing professional and personal competencies on eight levels. Each level is defined in terms of competences that a learner should have acquired upon completion of a particular qualification. These competencies guide the allocation of qualifications obtained in higher education, general education, vocational education and training, and all the levels have a uniform structure. The DQR distinguishes between two categories of competence: professional competence, which is subdivided into knowledge and skills, and personal competence, which is divided into social competence and autonomy. The concept of competence expresses the core aim of all areas of the German education system, which is to enable learners to develop a comprehensive ability to act ("Umfassende Handlungskompetenz") within an academic field or job-related activity. The emphasis is not solely on possessing knowledge and skills in isolation, but rather on the capacity and preparedness to apply that knowledge and act responsibly within a particular field of expertise (BMBF, 2013).

Worth mentioning is that the DQR levels have been linked to specific types of qualifications in formal education (fig 10). However, qualifications from informal and non-formal/non-regulated education such as micro-credentials have not yet been included in the framework in Germany (UNESCO-UNEVOC, 2022). The DQR is regarded as Germany's response to the European education policy agenda and it is based on the European Qualifications Framework (EQF), which provides a common reference framework for the recognition of qualifications across Europe. The EQF has eight levels, which corresponds to the levels of the German NQF

Table 5. National qualification framework levels in Gemany

DQR Levels	Education Qualification Types (including general education, higher education and VET)	EQF Levels
8	Doctorate and equivalent Art degrees	8
7	Master's degrees and equivalent higher education qualifications (traditional German courses of higher education study such as the first degree of Diplom or Magister, State Examinations) Strategic professional (IT) (certified) Other advanced vocational training pursuant to the Vocational Training Act or Crafts and Trade Regulation Code (level 7)	7
6	Bachelor's degree and equivalent higher education qualifications Specialist commercial clerk (certified) Business management specialist (certified) Master craftsman Operative professional (IT) Trade and technical school (advanced vocational training governed by federal State law)	6

	Advanced vocational training pursuant to § 54 of the Vocational Training Act (level 6) Other advanced vocational training pursuant to the Vocational Training Act or Crafts and Trades Regulation Code (level 6)	
5	IT specialist Service technician (certified) Advanced vocational training pursuant to § 54 of the Vocational Training Act Other advanced vocational training pursuant to the Vocational Training Act or Crafts and Trades Regulation Code (level 5)	5
4	Upper secondary general education school leaving certificate – General higher education entrance qualification Subject-linked higher education entrance qualification Higher education entrance qualification for university of applied sciences Dual VET (three-year and three-and-a-half-year training courses) Full-time vocational school (vocational education and training governed by federal State law) Full-time vocational school (vocational education and training governed by federal State law in healthcare) Full-time vocational school (fully qualifying vocational education and training pursuant to the Vocational Training Act or Crafts and Trade Regulation Code) Retraining qualification pursuant to the Vocational Training Act (level 4)	4
3	Intermediate secondary school leaving certificate – General education, 10 years Intermediate secondary school leaving certificate – Full-time vocational school Dual VET (two years training courses)	3
2	Lower secondary school leaving certificate – General education, nine years Vocational training preparation (vocational preparation scheme, prevocational training year, introductory training) Basic vocational training – Full-time vocational school	2
1	Vocational training preparation (vocational preparation scheme, prevocational training year)	1

Source: CEDEFOP (2020)

3.2.3. Micro-credentials and the National Qualification Framework in Spain

Spain has been working on developing the Spanish Qualifications Framework for Lifelong Learning, known as the Marco Español de Cualificaciones (MECU). This draft framework is comprehensive, organised around learning outcomes, and includes eight levels defined by descriptors that specify knowledge, skills, and competence. It is designed to cover qualifications from all levels within the formal education system and to integrate those acquired through the validation of non-formal and informal learning experiences.

The technical aspects of the framework's design were finalized in 2018, with the legal foundation for its implementation expected to be established through a royal decree anticipated for adoption in 2021. MECU is primarily intended to serve as a tool for communication and information. Its main goals are to make Spanish qualifications more understandable by defining them based on learning

outcomes, clarifying the relationships between different qualifications, and indicating the qualification level on certificates and diplomas. The framework aims to enhance access to and participation in lifelong learning, promote the recognition of qualifications, and facilitate comparability within Spain and across Europe.

The Ministry of Education and Vocational Education and Training (VET) is responsible for overseeing the development and implementation of MECU. The development process involved consultations with a broad range of stakeholders, including other ministries, social partners, institutional coordination bodies, consultative bodies, evaluation agencies, professional associations, and regional education councils. Once the legal framework is established, priority will be given to formal education and training qualifications, as well as employment-related certifications (certificados de profesionalidad) (UNESCO-UNEVOC, 2022).

Draft MECU levels	MECES levels	Higher education qualifications	QF-EHEA
8	4	Doctoral degree (*Doctorado*)	Third cycle
7	3	Master degree (*Master*)	Second cycle
6	2	Bachelor degree (*Grado*)	First cycle
5	1	Advanced technician (*Técnico superior*)	Short cycle
4			
3			
2			
1			

Figure 10. Qualification frameworks for higher education (MECES)

Micro-credentials in higher education typically correspond to different levels of MECU, depending on the complexity and depth of the content. These levels include:

Level 5: This level generally includes short-cycle tertiary education qualifications, such as advanced diplomas or associate degrees. Micro-credentials at this level could be part of continuing education or professional development programs.

Level 6: Bachelor's degree level, where micro-credentials might represent specific competencies or skills relevant to undergraduate education or professional practice.

Level 7: Master's degree level, where more advanced micro-credentials can be aligned with post-graduate education, focusing on specialized knowledge or advanced professional skills.

Level 8: Doctoral level. Although micro-credentials at this level are less common, they could be linked to highly specialized research skills or knowledge areas.

The alignment of micro-credentials with MECES levels ensures that learning outcomes are positioned within the broader educational and professional framework in Spain, enhancing their portability and value across different sectors and countries (CEDEFOP, 2023; European Commission, 2024).

The national strategy for integrating micro-credentials into higher education is guided by the Plan Microcreds (Ministerio de Universidades, 2023), which provides a policy framework aligned with the European approach to micro-credentials. Within this framework, the most comprehensive regional implementation has taken place in Catalonia through the MicroCredCat Project, coordinated by the Government of Catalona, the Catalian University Quality Assurance Agency (AQU Catalunya), and the 12 universities (public and private) in the Catalan university system. This initiative was supported by the Secretariat for Universities and Research, the Catalan Public Employment Service, and the Catalan Continuous Training Consortium, ensuring strong collaboration between government, education, and labour market actors.

MicroCredCat defined Short Learning Programmes (SLPs) at EQF Levels 6 and 7, integrating them into the Catalan university system and establishing quality assurance procedures consistent with the European Standards and Guidelines (ESG). The Catalan experience now serves as a reference for the national rollout of Micro-credentials under *Plan Microcreds,* demonstrating how regional systems can operationalise national and European frameworks (Generalitat de Catalunya & AQU Catalunya, 2023).

3.2.4. Micro-credentials and the National Qualification Framework in Poland

The NQF in Poland, known as the Polska Rama Kwalifikacji, is a system designed to organize and standardize qualifications across various levels of education and professional training. It aligns with the European Qualifications Framework (EQF), ensuring that Polish qualifications are recognized and comparable across Europe. The NQF comprises 8 levels, which correspond directly to the levels in the EQF:

Levels 1-4: These cover qualifications obtained through general education, vocational education, and the early stages of professional training. For instance, Level 4 aligns with the completion of upper secondary education, such as passing the matura exam.

Level 5: This includes short-cycle higher education qualifications, such as post-secondary education or specialized vocational training programs. These programs do not lead to a full degree but provide significant professional competencies.

Levels 6-8: These correspond to higher education qualifications, with Level 6 representing a bachelor's degree, Level 7, a master's degree (Magister), and Level 8, a Doctoral degree.

The NQF places a strong emphasis on learning outcomes rather than the duration or type of education. Each level is defined by descriptors related to knowledge, skills, and social competence, focusing on what individuals know and can do upon completing a qualification. Supporting lifelong learning, the NQF recognizes qualifications acquired through formal, non-formal, and informal education. This approach facilitates the validation of prior learning and the acquisition of new competencies throughout a person's career.

The development and implementation of the NQF involve various stakeholders, including educational institutions, employers, and professional associations, ensuring the framework meets the needs of both the labor market and society. The NQF was formally established in 2011 through the Act on the

Integrated Qualification System, with full implementation in the following years. The system is maintained and updated by the Ministry of Education and Science to ensure its continued relevance and alignment with European standards (European Commission, 2023).

Regarding the linking of micro-credentials to the NQF, a significant portion of micro-credentials in Poland, particularly those requiring less than 200 hours of study, are classified as market qualifications. These market qualifications are considered partial qualifications under the Integrated Qualifications System (IQS), which aligns with the Polish NQF. Furthermore, micro-credentials are associated with partial qualifications, which are distinct from full qualifications typically associated with formal education stages. These partial qualifications can correspond to different levels of the NQF depending on their complexity and the learning outcomes they cover. There are however, micro-credentials that are too small or do not meet the formal requirements to be included in the IQS. Despite this, the Badge+ project is an initiative aimed at creating a register for such micro-credentials, providing a structure for their recognition outside the formal IQS system.

Micro-credentials offered by higher education institutions can be linked to the European Credit Transfer System (ECTS), which corresponds to various levels of the NQF depending on the level of study they are associated with (e.g., bachelor's, master's) (Stasiowski 2023)

4. Accreditation and quality assurance of micro-credentials

This section examines the accreditation and quality assurance of micro-credentials offered by higher education institutions at the European and national levels.

4.1. Accreditation and quality assurance of micro-credentials at the European level

A survey conducted under the MICROBOL Project (Micro-credentials linked to the Bologna Key Commitments) revealed that most countries monitor the quality of educational courses through both programme accreditation/evaluation and accreditation/evaluation of HEIs. Fewer countries monitor quality solely through one of these approaches. The MICROBOL survey also found that, although micro-credentials are often not explicitly mentioned in national regulatory frameworks, most countries consider them to be implicitly covered by existing quality assurance systems for higher education (MICROBOL, 2021). Despite this, the majority of countries lack a national database of micro-credentials, and information about these credentials and their quality assurance is typically provided only by the educational institutions themselves.

The European Standards and Guidelines (ESG), which are used to assess higher education institutions and quality assurance bodies within the European Higher Education Area (EHEA), can also be applied to the quality assurance of micro-credentials. The introductory section of the ESG emphasizes that these standards apply to all higher education in the EHEA, regardless of the mode of study or location of delivery. The term "programme" in the ESG is broadly defined to include all forms of higher education, even those not leading to a formal degree, and covers education corresponding to EQF Level 5 and above. There is likewise no restriction preventing the ESG from being applied to educational programmes offered by HEIs at lower EQF levels.

Surveyed countries generally agree that the ESG is comprehensive enough to be applied to micro-credentials. They also note that ad hoc external quality procedures, such as individual course or programme accreditation can be too disproportionately burdensome for short, flexible learning experiences. Instead, most recommend that micro-credentials be evaluated as part of the overall institutional quality assurance system (Lantero et al., 2021).

While most quality assurance agencies reported that their external quality assurance activities do not yet formally include micro-credentials, a significant number plan to develop specific methodologies or extend existing QA mechanisms to cover the design, delivery and recognition of micro-credentials in the future (Lantero et al., 2021). According to the survey, 23% of agencies stated that their external quality assurance activities already cover micro-credential offerings, often through assessments of internal quality systems that include micro-credentials. However, only 15% have specific procedures for the external quality assessment of micro-credentials. The European policy debate continues on whether the ESG should also be used as a basis for micro-credentials offered by other providers, such as training centres and associations. Opinions differ on whether such education should be considered part of higher education. Among the surveyed agencies, 15 indicated that they have procedures in place for assessing certificates offered by non-HEI providers, although these procedures are not always aligned with the ESG (EQAR, 2021).

Regarding the quality assurance of online learning, there are currently no specific European standards developed for this purpose. However, various recommendations exist, such as those from the

European Association for Quality Assurance (ENQA) and the European Association of Distance Teaching Universities (EADTU). The ESG is considered general enough to be applicable to online learning as well. The European Commission Consultation Group has made the following conclusions regarding the quality assurance of micro-credentials (Shapiro Futures et al., 2020):

- HEIs that are externally quality-assured in line with the ESG should be seen as trusted providers of micro-credentials, and the Database for Quality Assurance Results (DEQAR) includes information on such institutions.
- The same quality principles that apply to higher education degrees should also apply to micro-credentials when delivered by higher education institutions.
- Additional guidelines may be needed to clarify how the ESG could be applied specifically to micro-credentials.

4.2. Accreditation and quality assurance of micro-credentials in Latvia

In Latvia, the accreditation and quality assurance of micro-credentials offered by universities are governed by a framework that aligns with broader European standards, specifically the Standards and Guidelines (ESG) for Quality Assurance in the European Higher Education Area. However, micro-credentials are a relatively new concept in Latvia, and the regulatory framework is still evolving. Micro-credentials in Latvia are generally integrated into the existing higher education quality assurance processes. This means that universities offering micro-credentials must ensure that these offerings meet the same quality standards as traditional degree programs. The Latvian Academic Information Centre (AIC) plays a significant role in this process, ensuring that micro-credentials are included within the Latvian Qualifications Framework (LQF). This inclusion is crucial for the recognition and quality assurance of these credentials, ensuring they meet national and European standards.

However, there is no specific national database for micro-credentials, and quality assurance for these programs often relies on the institutions themselves. This can lead to variability in how micro-credentials are managed and assessed across different universities. The ongoing policy discussions and workshops, such as those organised by the AIC, highlight the importance of establishing clearer guidelines and frameworks for micro-credentials to ensure their quality and recognition both nationally and internationally. For more detailed guidance and updates, Latvian universities and quality assurance bodies often refer to the ESG and the work of international organisations like ENQA (European Association for Quality Assurance in Higher Education) to align their processes with best practices across Europe (Academic Information Centre, 2022; AIKA, 2024).

4.3. Accreditation and quality assurance of micro-credentials in Germany

In Germany, the accreditation and quality assurance of micro-credentials offered by universities are governed by a structured process that aligns with the broader higher education accreditation framework. The German Accreditation Council (Akkreditierungsrat) plays a central role in overseeing the quality assurance of teaching and learning at higher education institutions (HEIs). While micro-credentials are relatively new, they are increasingly being integrated into the existing quality assurance systems designed for traditional degree programs. Micro-credentials, when offered by universities, are often subject to the same accreditation standards as other academic programs. This means that they must adhere to the principles outlined by the European Standards and Guidelines (ESG), which are designed to ensure high-quality education across the European Higher Education Area (EHEA).

However, there is ongoing debate in Germany regarding the extent to which micro-credentials should be aligned with existing qualifications frameworks, such as the EQF. Some German stakeholders are cautious about fully integrating micro-credentials into these frameworks, fearing it might dilute the value of traditional qualifications.

Quality assurance for micro-credentials typically involves both internal and external processes. Internally, universities apply their established quality management procedures, which include curriculum development, assessment standards, and student feedback mechanisms. Externally, the accreditation bodies evaluate whether these micro-credentials meet the necessary academic standards and contribute effectively to lifelong learning. However, it is important to note that the German higher education system is still evolving in this regard. There are some skepticisms about the administrative and financial burdens that might arise from fully integrating micro-credentials into the national qualification frameworks. Despite this, there is a growing recognition of the need for flexible and responsive education systems that can accommodate the increasing demand for micro-credentials, especially in the context of lifelong learning and continuous professional development (German Accreditation Council, 2023).

4.4. Accreditation and quality assurance of micro-credentials in Spain

The accreditation and quality assurance of micro-credentials offered by universities in Spain are increasingly being integrated into the broader framework used for higher education. Micro-credentials, which are short, focused educational offerings, are evaluated within the same quality assurance systems that govern traditional degree programs. These systems are aligned with the European Standards and Guidelines (ESG) for quality assurance within the European Higher Education Area (EHEA).

Spain uses a decentralised QA system. The accreditation role is shared between the national agency, ANECA, and the regional quality assurance agencies operating under the authority of the regional government. For example, AQU Catalunya oversees the accreditation of university programmes in Catalunya, ensuring that both degrees and micro-credentials comply with ESG-aligned standards. Universities in Spain typically undergo institutional accreditations that encompass all their educational offerings, including micro-credentials. This approach aligns with broader European practices where micro-credentials are assessed as part of the overall institutional quality assurance process rather than through separate, specialized accreditation procedures.

Moreover, the integration of micro-credentials into the DEQAR (Database for Quality Assurance Results) ensures transparency and accessibility of quality information, supporting the credibility of these offerings. However, challenges remain, particularly in ensuring that micro-credentials offered by non-traditional providers (e.g., private training centres) meet the same standards as those provided by universities. As the demand for micro-credentials grows, Spain continues to adapt its quality assurance frameworks to better accommodate these new forms of learning, ensuring they maintain rigorous educational standards (ENQA, 2024).

4.5. Accreditation and quality assurance of micro-credentials in Poland

The accreditation and quality assurance of micro-credentials provided by universities in Poland are closely connected to the wider framework of higher education quality assurance, which is aligned

with the ESG. Although micro-credentials are not always explicitly defined within national legislation, they are typically considered under the existing quality assurance systems applicable to higher education. These systems include both the accreditation of higher education institutions and the evaluation of their specific programmes. The Polish Accreditation Committee (PKA), which is responsible for the accreditation of higher education in Poland, plays a key role in ensuring that the micro-credentials meet the national and European standards of quality.

As in many other European countries, there is currently no separate or specific national database for micro-credentials in Poland, so information about these credentials is usually available only through the institutions that offer them. While micro-credentials can be covered by the general accreditation processes for institutions and programmes, specific quality assurance procedures for micro-credentials are still developing. Recent studies suggest that many quality assurance agencies are starting to explore or pilot frameworks adapted to the characteristics of short, flexible learning opportunities such as micro-credentials (Cedefop, 2023).

Ongoing European policy discussions are influencing Poland's approach, particularly concerning whether the ESG should apply to micro-credentials offered by non-traditional providers, such as private training centres. The consensus in Poland, as in other European countries, is that while micro-credentials should be held to the same quality standards as other forms of higher education, specific guidelines and procedures may be needed to address their unique characteristics (Cedefop, 2024)

4.6. The role of qualification framework in awarding micro-credentials

The European Qualifications Framework (EQF) is a system designed to describe qualifications based on what learners achieve, which can apply to all levels of education. This system could potentially include micro-credentials (small, focused qualifications) if countries decide to add them to their own national qualification systems. Some countries like Austria, Denmark, France, Ireland, Netherlands, Poland, Finland, and Sweden are already allowing smaller qualifications, especially those that are highly relevant to the job market, to be included in their national frameworks.

As digital and flexible learning pathways become more common across Europe, there is a growing need to integrate micro-credentials into broader qualification structures (European Commission, 2020). For such integration to be meaningful, the learning outcomes associated with micro-credentials must be transparent and comparable, something that qualification frameworks can help with (Council of the European Union, 2022). Although the formal inclusion of micro-credentials in national qualification frameworks remains in its early stages, experts agree that they should have a recognised reference point within national education and training systems to ensure their credibility and portability (Cedefop, 2023) internationally, it's becoming clear that these micro-credentials need some kind of reference within the overall education and training systems.

There has been some debate about how micro-credentials should be linked to the EQF. Some experts argue that micro-credentials should be directly referenced to the EQF, while others think contend that such alignment does not align with EQF implementation, which usually reserve EQF level references for national qualification frameworks (Council of the European Union, 2022). A middle-ground approach has therefore been suggested, where micro-credentials could be aligned within national qualification frameworks, and by extension, the EQF. The discussion group also recognized that different

countries have different rules, so any changes need to be flexible. For instance, some countries don't currently allow non-formal qualifications (those not issued by traditional education institutions) to be part of their national frameworks. The group suggested dividing micro-credentials into two types:

- Micro-credentials from formal education institutions, which can more easily be aligned with the EQF and European Credit Transfer and Accumulation System (ECTS) and may follow existing higher education standards; and
- Micro-credentials from non-formal education providers, which require further discussion to figure out appropriate quality assurance and recognition mechanisms (European Commission, 2020).

For example, in Spain, national regulations and practices increasingly encourage non-formal providers to partner with accredited HEIs to ensure that their micro-credentials meet recognised standards and can be linked to the formal qualification frameworks.

4.7. Recommendations for ensuring quality of micro-credentials

The credibility and quality of micro-credential offerings can be enhanced by aligning the design, development and delivery of micro-credentials with the European Standards and Guidelines (ESG) as well as the MICROBOL framework. The following represent specific action points that micro-credential providers must consider.

- Integrate micro-credentials into institutional QA systems as a way to meaningfully ensure that all short learning experiences undergo proportional internal and external review (ENQA, 2024).
- There is no one-size-fits-all approach to micro-credential implementation, therefore providers of micro-credentials must adopt a fit-for-purpose QA approach that applies ESG principles flexibly while maintaining integrity and comparability across institutions (MICROBOL, 2021).
- Careful thought should be put into developing QA guidelines specifically for micro-credentials, covering assessment validity, learner authentication, workload estimation, and credit allocation (Cedefop, 2023).
- Where possible, encourage national QA agencies to register micro-credential evaluations in the DEQAR database in order to increase transparency for learners and employers.
- Collect and use learner feedback in improving micro-credential design and delivery. Importantly, include learner feedback and employer input as indicators of relevance and quality in external reviews.
- Facilitate mutual recognition of QA results across borders through EQAR-listed agencies. This approach can help to reduce administrative duplication.
- Incorporate micro-credentials offered by non-traditional providers into QA frameworks using accreditation partnerships with HEIs, as seen in Spain and the Netherlands. When non-HEI micro-credential providers partner with universities, their collaboration introduces an additional layer of validation that can enhance the overall quality of the micro-credentials offered.
- Strengthen the capacity of staff responsible for QA through the European peer-learning and staff development initiatives under the Bologna Follow-up Group (BFUG).

5. Awarding micro-credentials

The awarding of micro-credentials refers to the process of recognizing and validating the learning outcomes achieved by an individual through short, focused educational experiences. Micro-credentials can be awarded by various institutions, including universities, training providers, and professional bodies, and are often designed to be stackable, meaning learners can accumulate multiple micro-credentials over time to lead to larger qualifications or demonstrate comprehensive expertise in a given field (European Commission, 2022). At the European level, the awarding of micro-credentials is being standardized to ensure quality, recognition, and portability across member states. This process follows the recommendations of an ad hoc consultation group consisting of experts on higher education from various European countries. The goal of the group is to propose a common definition and recommendations for a European approach to the development and adoption of micro-credentials across Europe. The proposed EU standard of constitutive elements of micro-credentials are:

- Identification of the learner
- Title of the micro-credential
- Country/region of the issuer
- Awarding body
- Date of issuing
- Notional workload needed to achieve the learning outcomes (in ECTS, wherever possible)
- Level (and cycle, if applicable) of the learning experience leading to the micro-credential (EQF and/or national qualifications framework; Overarching Framework of Qualifications of the European Education Area)
- Learning outcomes
- Form of participation in the learning activity (online, on-site, or blended, volunteering, work experience)
- Prerequisites* needed to enrol in the learning activity
- Type of assessment (testing, application of a skill, portfolio, recognition of prior learning, etc.)
- Supervision and identity verification during assessment* (unsupervised with no identity verification, supervised with no identity verification, supervised online or onsite with identity verification)
- Quality assurance of the credential and, where relevant, of the learning content
- Grade achieved*
- Integration/stackability options* (standalone, independent micro-credential / integrated, stackable towards another credential)
- Further information*

(*) are optional (European Commission, 2020).

5.1. Recognition of micro-credentials for education and training

Recognition of micro-credentials in education and training is defined as the formal acknowledgement by a competent recognition entity, granting an applicant the right to apply for admission to an education or training program, transfer credit within it, or receive an exemption for part or all of the program (European Training Foundation, 2022). Recognition may include stacking micro-credentials to

certify learning outcomes. This recognition can occur through various routes, depending on the existence of credit-sharing and recognition agreements or through regional or global recognition frameworks and validation arrangements. In Europe, universities hold the prerogative for recognizing qualifications when learners seek recognition. Due to the absence of standardized definitions, procedures, and assessment criteria for micro-credentials, organisations in education and training are required to customize their criteria for the recognition process. The project 'Evaluating e-learning for academic recognition' —e-Valuate—recommended seven criteria to look out for regarding the recognition of stand-alone micro-credentials:

- Procedures for quality assurance, whether internal or external, which are applied to the MC or the MC provider.
- Online verification of the MC provider as well as the identity of the MC holder.
- NQF/EQF level reference
- Learning outcomes with reference to a skill or competence framework.
- Theoretical and actual workload undertaken by a learner.
- Standardised assessment rubrics. The Nuffic Project developed a freely available online traffic model to aid recognition of MCs against these criteria (Nuffic, 2022) (see fig. 11).

Level of robustness	Quality	Authenticity	Level	Learning outcomes	Workload	Testing	ID
0							
1							
2							
3							

Figure 11: Traffic light model

Does not meet the required standards

Represents areas that are borderline or require improvement

Generally, meets the required standards but may have minor areas for improvement.

Highest level of quality, indicating that the program or institution exceeds the required stand-

Three possible routes to facilitate the recognition of MCs in HEIs include inter-provider credit exchange agreements, recognition of prior learning, and international conventions (figure 12).

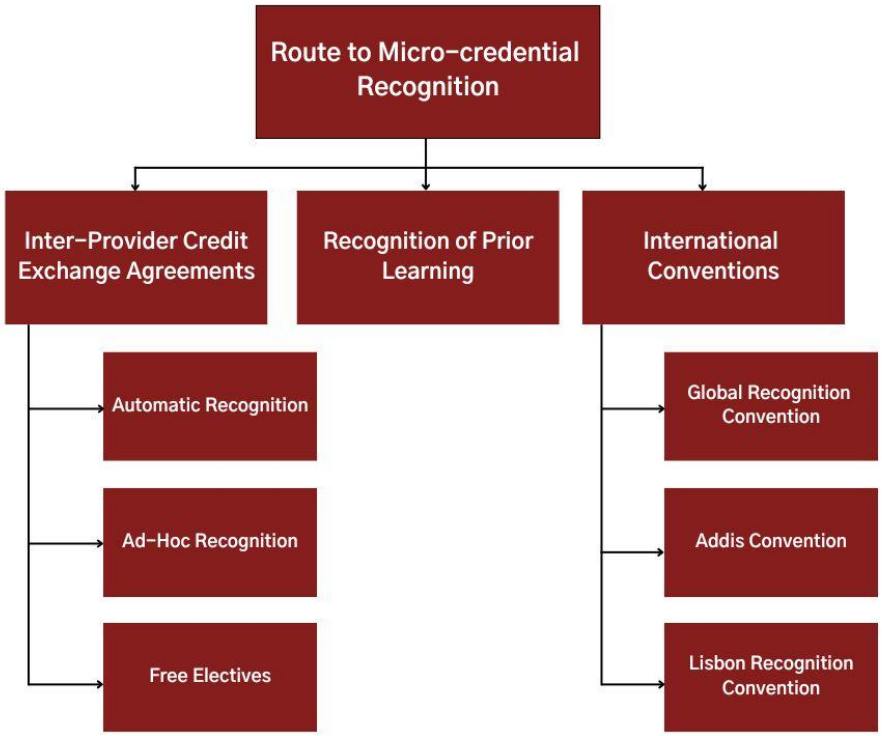

Fig 12: possible routes for recognizing micro-credentials

Recognition through credit-exchange agreements: This typically found in mobility programs bound by consortium agreements. The inter-provider credit exchange can occur through three ways:

1. Automatic recognition via inter-institutional agreements: Credits are automatically recognized between institutions based on pre-existing agreements
2. Ad hoc recognition through inter-institutional agreement: Unlike automatic recognition, here, micro-credentials are regulated on a case-by-case basis, according to predetermined learning agreements.
3. Recognition via free electives: Credits or workloads are recognized if they are awarded by a certified or recognized institution and are often used for elective courses.

Recognition of prior learning (RPL): Prior learning refers to the experience, knowledge, skills, attitudes, and competencies that how much credit would be transferred, given that each HEI sets its own maximum transferable an individual has acquired through formal, non-formal, or informal learning, assessed against a given set of learning outcomes, objectives, or standards (UNESCO, 2019). This custom-oriented recognition route is always available when no other routes apply. Prior learning may also be validated through a process termed credit recognition, and this means that an academic expert typically makes an assessment as to how much credit would be transferred given that each HEI sets its own maximum transferable credit. In RPL, it is important to emphasize the need for universities to establish processes for recognizing micro-credentials issued within a given HEI, especially for micro-credentials without ECTS (European Commission, 2015).

Recognition using international conventions: The Erasmus+ Project "Micro-credentials linked to the Bologna Key Commitments - MICROBOL" suggests that micro-credentials awarded by higher education institutions can be classified under the Lisbon Recognition Convention (LRC) either as a period of study or, if awarded as a stand-alone credential, as a qualification (MICROBOL, 2021). This classification allows for the assessment of these micro-credentials in accordance with the principles and procedures outlined in the convention.

The Global Recognition Convention offers more explicit support for micro-credentials by emphasizing the recognition of prior learning and qualifications based on partial studies. This creates a strong policy imperative for signatory countries to utilize the convention's tools to facilitate the recognition of micro-credentials.

5.1.1. Academic recognition of micro-credentials in Latvia

Since 2012, Latvia has had a system in place for recognizing learning outcomes obtained through prior learning and professional experience in higher education. However, this process is not managed at a national level. Instead, each higher education institution (HEI) develops its own approach and practices based on the guidelines and regulatory framework provided by the Ministry of Education and Science. HEIs also set the fees for the recognition process. Typically, a committee within the HEI reviews submitted documents within one month. If the documents meet the study program's requirements and intended learning outcomes, the committee awards the appropriate number of credits, allowing the student to enrol in the program. Each case is assessed individually, and the recognized learning outcomes cannot replace final exams, state exams, qualification exams, or a doctoral thesis.

Additionally, knowledge, skills, and competences gained from continuing education programs, professional development, non-formal education, or self-study can be recognized as fulfilling parts of a study program. This recognition is similar to partial qualification recognition but does not result in a formal certification document. Regarding study courses and modules, the Law on Institutions of Higher Education allows students to accumulate study work confirmed by certificates. If a student has relevant prior education, they can request that the HEI evaluate the work to see if it aligns with the study program, awarding credits accordingly (Section 592).

According to the draft guidelines for education and development for 2021–2027 (Ministry of Education and Science, 2020), there are plans to improve the recognition process. This includes developing methods to recognize competences acquired outside formal education and enabling the recognition of parts of qualifications. Worth mentioning is that some HEI experts believe that the current system for recognizing prior learning outcomes is not efficient enough. They suggest that authorities should enhance these processes and provide more methodological support to HEIs (Lice, 2021).

5.1.2. Academic recognition of micro-credentials in Germany

In Germany, the recognition of micro-credentials by universities is increasingly gaining traction, driven largely by European initiatives and the growing demand for flexible, lifelong learning options. The uptake of micro-credentials in Germany is heavily influenced by the European Union's recommendations. In June 2022, the EU Council adopted a recommendation on a European approach to

micro-credentials. This framework aims to standardize the quality, transparency, and recognition of micro-credentials across Europe. German universities are aligning with these guidelines to ensure that their micro-credentials are recognized both nationally and internationally. While the adoption is growing, challenges remain, particularly in achieving uniform standards for recognition and quality assurance. German universities are working towards integrating these micro-credentials strategically, often within European University Alliances, which further facilitate cross-border recognition and collaboration (Orr et al., 2020).

Take for example, the recognition of micro-credentials and prior learning at the Carl von Ossietzky University of Oldenburg, is managed through a process known as Prior Learning Assessment and Recognition (PLAR). This process is designed to give students credit for skills and knowledge they have already acquired through previous education, vocational training, or professional experience, potentially shortening the duration of their studies. The process overview is as follows.

- Eligibility and application: Students enrolled in part-time bachelor's or master's programs are eligible to apply for PLAR. Applications can be submitted at any time before a course module is taken or its examination completed.
- Assessment types
  (a) General assessment: This applies to recognized vocational qualifications where a predetermined number of credits can be awarded. The university conducts an equivalence assessment to determine if the qualification matches the learning outcomes of the program.
  (b) Individual assessment: For other types of prior learning, students must submit a portfolio demonstrating how their prior knowledge and skills align with the specific learning outcomes of the modules in their chosen program.
- Equivalence assessment: The university assesses prior learning based on its equivalence to the learning outcomes of the target module. Credits are awarded if the prior learning overlaps with at least 70% of the module content. Only complete modules can receive credit.
- Grade transfer and decision: Grades from recognized prior learning are transferred if they match the grading system of the target module. If they differ, a conversion formula is applied. The decision on awarding credit is made by the examination board within 12 weeks of application submission (Carl von Ossietzky University of Oldenburg, 2019).

5.1.3. Academic recognition of micro-credentials in Spain

Universities in Spain are increasingly recognizing the importance of micro-credentials in providing flexible and specialised learning pathways. Several national digital initiatives are being developed to strengthen the interoperability, portability, and recognition of these credentials within and beyond Spain's higher education system.

Among them, the CertiDigital Project, coordinated by the Universidad Carlos III de Madrid, focuses on building a digital infrastructure for the issuance, validation, and recognition of micro-credentials across universities and professional sectors. The project aligns with European digital credential standards, including the Europass Digital Credentials Infrastructure (EDCI), and aims to formalise and recognise courses and programmes of varying durations (Universidad Carlos III de Madrid, 2021).

Complementing this initiative are two additional projects under the UniDigital Programme, supported by the Spanish Ministry of Universities and CRUE Universidades Españolas:

- CAMINS (Interoperabilidad para la transferencia de expedientes entre universidades y/o sector privado), which develops systems for the interoperability of academic records between universities and private-sector organisations; and
- CAD (Credenciales Académicas Digitales), which focuses on creating a secure, verifiable system for issuing digital academic credentials that can be integrated into both national and European frameworks (UniDigital, 2023a; UniDigital, 2023b).

These initiatives suggest growing efforts to establish a trusted, interoperable ecosystem for academic recognition and mobility, consistent with the European Blockchain Services Infrastructure (EBSI) and the EU's vision for digital credentials.

5.1.4. Academic recognition of micro-credentials in Poland

In Poland, universities recognize and validate micro-credentials through a framework that emphasizes alignment with the National Qualifications Framework (NQF). The validation process involves assessing non-formal and informal learning outcomes against established educational standards. This is often done through modular qualifications, which can be stacked towards full qualifications. Universities collaborate with various stakeholders, including employers, to ensure that the content and outcomes of micro-credentials remain relevant labour market needs (Budzewski, 2024).

Validation practices in Poland include a combination of skills audits, portfolio assessments, and examinations, allowing learners to certify the acquired competencies. The legal and strategic foundation for these procedures is provided by the Integrated Skills Strategy 2030 and adopted by the Polish Council of Ministers. The strategy outlines procedures for the validation of non-formal and informal learning outcomes, ensuring that such learning can contribute to further education or professional development (Ministry of National Education, 2020.).

This approach aims to support transparency and portability of qualifications in line with the European Qualifications Framework, reinforcing the country's commitment to lifelong learning

5.2. Industry acceptance and recognition of micro-credentials

The acceptance and recognition of micro-credentials by industry in Europe are steadily increasing, particularly as employers seek flexible, skills-based qualifications to address technological change and workforce transformation. Micro-credentials offer a way to certify specific, job-relevant competencies and are especially valued in sectors experiencing rapid innovation, such as information technology, engineering, digital marketing, healthcare, and project management. Employers in these fields view micro-credentials as indicators of up-to-date, verifiable skills that can be applied immediately in the workplace (European Commission & Cedefop, 2024).

Recent labour-market analyses show that digital learning and credentialing platforms are shaping employer recognition of micro-credentials. LinkedIn Learning, for example, actively promotes and integrates micro-credentials into user profiles, enabling employers to verify candidates' digital badges

and completed learning pathways (LinkedIn, 2023). Similarly, global technology firms such as IBM, Google, and Microsoft have partnered with European higher education institutions to issue industry-recognised micro-credentials through platforms like Coursera and edX, bridging the gap between academic and professional qualifications (UNESCO, 2022).

However, the level of employer acceptance varies across sectors. While technology-driven and service-oriented industries have adopted micro-credentials enthusiastically, more traditional sectors, such as law, medicine, and public administration, continue to rely heavily on formal degrees and regulated professional qualifications. This divergence underscores the need for closer collaboration between industry representatives, accreditation bodies, and education providers to ensure that micro-credentials remain relevant, trustworthy, and aligned with occupational standards (Cedefop, 2023)

5.3. Industry collaboration with university micro-credential providers

Collaboration between industry and university micro-credential providers is crucial for ensuring that the credentials offered are relevant and meet the needs of the labour market. Across Europe, partnerships between HEIs, industry, NGOs, and public-sector organisations are becoming increasingly common as universities seek to align education more closely with economic, technological, and societal challenges.

Such collaborations often involve co-designing course content, defining competency frameworks, and providing work-based or community-based learning opportunities as part of micro-credential programmes. For example, the CIVIS European University Alliance, which brings together ten universities across Europe, has developed micro-credentials in cooperation with industry actors, NGOs, and local communities. Such collaborations address skills gaps in priority areas such as digital transformation, sustainability, migration, and health, and are explicitly structured to strengthen the link between academic knowledge and practical, real-world applications (CIVIS, 2025) By engaging diverse partners from the private and non-profit sectors, universities can ensure that their micro-credentials enhance learners' employability, civic engagement, and lifelong learning opportunities. This approach also allows industries and communities to access a workplace equipped with adaptable skills and a strong sense of social responsibility (European Training Foundation, 2023).

5.4. Recommendations for strengthening awarding process of MCs

The awarding of micro-credentials requires coordinated standards, digital interoperability, and cross-sector partnerships. The following practices can support the awarding process of micro-credentials within formal and non-formal education contexts.

- Adopt the European Learning Model (ELM) to standardise metadata across all issued credentials (issuer, learner, EQF level, credits, skills) (European Commission, 2024).
- Ensure interoperability by connecting national systems to the Europass Digital Credentials Infrastructure (EDCI) and EBSI blockchain for verifiable issuance.
- Formalise co-design and co-creation mechanisms where employers, NGOs, and public-sector bodies help define competencies and outcomes to ensure relevance (ETF, 2023).
- Provide clear awarding criteria, including workload, quality assurance status, and alignment with national qualifications frameworks.

- Develop stackable pathways that can allow multiple micro-credentials to contribute toward larger qualifications, such as degrees or professional certifications (OECD, 2021).
- Encourage public–private partnerships for funding and co-issuing industry-endorsed micro-credentials. For example, IBM–Coursera and EU4Digital initiatives.
- Introduce national recognition seals or trust marks for accredited micro-credential issuers, increasing market confidence.
- Monitor employability outcomes through tracer studies and data exchange between universities, labour ministries, and employers.

5.5. Recommendations for enhancing academic and professional recognition of MCs

For micro-credentials to achieve their full potential, learners must be able to have them recognised easily across borders, institutions, and employment systems. Strengthening recognition requires a clearer framework and shared trust among providers.

- Where possible, build recognition into national systems. Countries should include micro-credentials in their higher education and lifelong-learning legislation and consider linking them to national qualifications frameworks. However, this integration must ensure a clear distinction between micro-credentials and full qualification programmes to prevent the dilution of established qualification frameworks standards and to maintain transparency regarding learning outcomes, credit value and progression pathways.
- Rely on learning outcomes, not form. Recognition should be based on what a learner can actually do, following the principles of the Lisbon Recognition Convention and the 2022 Council Recommendation. The emphasis should be on verified learning outcomes: the knowledge, skills, and competences acquired rather than the learning format, duration, or provider type.
- Make recognition visible. Creating national or regional databases of recognised micro-credentials, connected to Europass or EBSI, would increase transparency and comparability.
- Invest in institutional capacity. Universities and quality assurance agencies need both training and clear, transparent procedures for assessing prior learning and non-formal learning achievements. Building institutional capacity involves equipping academic and administrative staff with the tools and criteria to evaluate diverse forms of evidence such as portfolios, digital badges, or workplace learning outcomes against national or institutional standards.
- Pilot automatic recognition. For example, partnerships of European University Alliances could lead by testing mutual recognition of short learning programmes across borders.
- Recognition processes should actively involve employers and other social partners to ensure that micro-credentials have genuine value in professional and labour market contexts. Employer engagement helps align micro-credentials with evolving skill needs and occupational standards, thereby enhancing their employability impact. Collaboration can take the form of co-designing learning outcomes and assessment criteria or validating the relevance of credentials within specific industries.

6. Micro-credentials and the SDGs

- Micro-credentials, which are digital certifications that signify an individual's competence in a specific skill or area, can significantly contribute to achieving the United Nations Sustainable Development Goals (SDGs) by supporting inclusive education, skills development, and innovation. The flexibility, accessibility, and responsiveness of micro-credentials to labour market and societal needs, position them as a strategic means for sustainable development across multiple dimensions.
- **Quality Education (SDG 4):**
  Micro-credentials provide lifelong learning by offering flexible, modular learning opportunities that complement traditional education pathways. Micro-credentials improve access to education for marginalised (Cole & Tibby, 2013) and non-traditional learners, including those in remote areas or balancing work and family commitments. By enabling continuous re-skilling and upskilling, micro-credentials align closely *Target 4.3* (equal access to affordable and quality education for all) and *Target 4.4* (skills for employment and entrepreneurship) (UNESCO, 2022).
- **Decent Work and Economic Growth (SDG 8):**
  By providing targeted skills training, micro-credentials can help individuals adapt to the rapidly changing job market. They empower workers to acquire the skills needed for emerging industries, thus enhancing employability and promoting sustained, inclusive economic growth (Oliver, 2019).
- **Reduced Inequalities (SDG 10):**
  Micro-credentials can play a role in reducing inequalities by offering educational opportunities that are more affordable and accessible than traditional degrees. They can particularly benefit those from disadvantaged backgrounds, providing a pathway to better job opportunities and economic mobility (Caballero et al., 2022).
- **Gender equality (SDG 5):**
  Micro-credentials can also support gender equality by offering women, who might face barriers to full-time education due to family responsibilities, a flexible way to gain skills and qualifications that enhance their career prospects (International Finance Corporation, 2022).
- **Industry, Innovation, and Infrastructure (SDG 9):**
  Micro-credentials contribute to sustainable industrialisation and innovation by developing the advanced technical and digital skills needed for Industry 5.0 and the green transition. Universities and industries collaborate to co-design micro-credentials that strengthen innovation ecosystems and human capital in fields like artificial intelligence, data science, and sustainable engineering. In doing so, micro-credentials help build resilient digital and educational infrastructure, a key enabler for innovation and competitiveness (OECD, 2021).
- **Partnerships for the goals (SDG 17):**
  Micro-credentials encourage collaboration between educational institutions, businesses, and governments, creating partnerships that are essential for developing relevant and high-quality educational programs that meet the needs of the labour market (Foundation for Young Australians, 2016).

6.1. Recommendations for integrating SDGs in micro-credentials

Micro-credentials can accelerate progress toward multiple SDGs by connecting education, employability, and innovation. The following are recommended:

- Integrate SDG-related competencies, such as sustainability literacy, social innovation, and ethical leadership, into the design of micro-credential curricula (UNESCO, 2022).
- Develop targeted micro-credentials for green transitions, addressing renewable energy, circular economy, and climate adaptation or other societal challenges (OECD, 2021).
- Foster inclusive education (SDG 4) by subsidising micro-credentials for disadvantaged learners, migrants, and adult learners (European Commission, 2024).
- Promote gender equity (SDG 5) by supporting women in STEM and entrepreneurship-focused micro-credentials, with flexible, remote delivery options (International Finance Corporation, 2022).
- Support innovation ecosystems (SDG 9) through university–industry collaboration and investment in digital infrastructure for lifelong learning.
- Promote decent work (SDG 8) by embedding micro-credentials into workforce development programmes linked to national employment strategies (Cedefop, 2023).
- Measure and report impact on the SDGs using appropriate institutional monitoring frameworks.
- Encourage transnational cooperation and collaboration (SDG 17) between governments, HEIs, and NGOs to exchange good practices and develop joint micro-credential frameworks.

7. Analysis of micro-credential implementation landscape in Latvia, Germany, Spain, and Poland

Micro-credential implementation across Latvia, Germany, Spain, and Poland reflects differing stages of maturity, institutional engagement, and regulatory development, shaped by national governance and alignment with European frameworks. Table 6 illustrates the synthesis of micro-credential implementation in the four countries.

Latvia

Latvia presents a formative but structured approach, integrating micro-credentials into its continuing education and lifelong learning system. Under the *Law on Institutions of Higher Education,* universities and colleges are allowed to offer short modules or standalone courses outside traditional degree programmes. These micro-credentials often take the form of non-formal adult education such as short courses, seminars, or professional development programmes aimed at upskilling learners (Ministry of Education and Science, 2020; Lice, 2021).

Although many HEIs in Latvia already provide continuing education, micro-credentials are not yet formally linked to the national qualifications system. Credit loads typically range from 1 to 8 ECTS, depending on the institution and course scope. The Latvian Qualifications Framework (LQF) provides a useful foundation for mapping learning outcomes, but recognition is done on a case-by-case basis. Ongoing efforts by the Academic Information Centre (AIC) and AIKA (the national QA agency) seek to link micro-credentials to formal qualifications, with an emphasis on quality assurance and validation of prior learning (ACI-NCP, 2022; AIKA, 2024).

Germany

Germany is in an exploratory phase when it comes to micro-credentials. Many universities are experimenting with short learning programmes through the European University Alliances and continuing education initiatives. According to DAAD (2022), roughly one in five HEIs in Germany already issue micro-credentials, and nearly a quarter are preparing to do so. The *Hochschulrektorenkonferenz* (HRK, 2023) notes that micro-credentials are offered within lifelong learning schemes, often linked to professional education and digital skills development.

There is no fixed ECTS framework yet, and credit loads vary significantly depending on the institution and program. Micro-credentials are typically quality-assured through the same mechanisms used for degree programmes, while academic recognition is handled individually by each university. Examples include the University of Rostock (EU-CONEXUS), University of Hamburg, and Technical University of Munich through EuroTeQ Engineering University. The University of Oldenburg's PLAR system (Prior Learning Assessment and Recognition) also exemplifies how prior learning can be formally credited (Carl von Ossietzky University of Oldenburg, 2019). While integration into the EQF is not yet formalized, discussions on linking micro-credentials to existing qualification levels are ongoing.

Spain

Spain has established the most comprehensive and systematized national framework for micro-credentials among the four countries. The Royal Decree 822/2021 formally incorporates micro-credentials and short learning programs into the higher education system, ensuring full ECTS integration and alignment with EQF Levels 6–7 (Government of Spain, 2021; ANECA, 2022).

HEIs in Spain HEIs generally offer micro-credentials between 4 and 15 ECTS, occasionally extending to 30 ECTS for broader programs. Quality assurance is fully embedded within the higher education QA system under ANECA and regional agencies such as AQU Catalunya. Academic recognition is mostly institutional but follows standardized procedures based on national and European guidelines. Implementation is strongly supported by public funding (e.g., €50 million through the Recovery, Transformation and Resilience Plan) and regional initiatives such as MicroCredCAT (ANECA, 2022; CEDEFOP, 2023; Elvira, 2023).

Poland

Poland is in an emerging phase, with policy groundwork and pilots led by the Educational Research Institute (IBE) and the Ministry of Science and Higher Education. The Odznaka+ (Badge+) platform, part of the Micro-credentials for Poland project, allows universities to issue European Open Badge-compliant micro-credentials (microcredentials.pl, 2025a). In 2023, Opole University of Technology became the first to award micro-credentials through this system.

Credit loads depend on the level of study and program design, and while integration into the EQF is not yet formalized, it is under discussion. Quality assurance follows the same standards applied to higher education programs. Academic recognition is possible within established institutional procedures, especially when courses are connected to formal studies or publicly funded programs. These developments are linked to the Integrated Skills Strategy 2030, which emphasizes lifelong learning and labour-market relevance (Stasiowski, 2023; Urbanik, 2022).

Table 6. Comparative analysis of MCs landscape in Latvia, Germany, Spain, and Poland

Country	ECTS Integration	Credit load	Quality Assurance	Academic recognition	Link to EQF level
Latvia	Possible	Between 1 to 8 credits	Integrated in HE QA system	Case-by-case approach	No
Germany	Varies	Varies	Integrated in HE QA system	Case-by-case approach	No
Spain	Yes (e.g. AQU Catalunya). Yes (according to Royal Decree 822/2021)	4 and 30 ECTS credits, 15 ECTS max.	Integrated in HE QA system	Case-by-case approach	Level 6 to 7
Poland	Possible	Depending on the level of study they are associated with	Integrated in HE QA system	Possible, against established institutional standards	No but possible
EU recommendation	Yes (e.g. European MOOC Consortium, 2015 ECTS User's Guide)	Notional workload of 100-150 hours; 4 – 6 ECTS; 1 ECTS; 60 – 90 ECTS	ESG, EADTU (online learning)	Standard recognition procedures used in recognising foreign qualifications and learning periods abroad	Level 5 to 8

Conclusion

Latvia, Germany, Spain, and Poland share the European vision of promoting flexible, skills-oriented, and lifelong learning pathways, each progressing at its own pace and following different institutional paths.

Spain stands out as the most mature and systematized example, with a clearly defined regulatory framework (Royal Decree 822/2021), strong public investment, and integration of micro-credentials into the national qualifications and quality assurance systems. Its approach demonstrates how strategic coordination between government, universities, and regional authorities can translate European recommendations into actionable national policy.

Germany, in contrast, illustrates a more decentralised and institution-driven approach. Although no unified national framework yet exists, HEIs are innovating through European University Alliances and continuing education structures, with growing attention to prior learning recognition and professional upskilling. This bottom-up experimentation is producing useful models for how micro-credentials can fit within existing quality and accreditation systems.

Latvia is gradually shaping a structured yet still exploratory system. Building on the Latvian Qualifications Framework and the country's experience with validating non-formal and informal learning, national bodies such as the Academic Information Centre and AIKA are developing procedures to map micro-credentials onto formal qualifications. Latvia shows how smaller higher-education systems can advance implementation through incremental policy alignment and targeted institutional support.

Poland represents an emerging but highly dynamic landscape, driven by the Ministry of Science and Higher Education and the Educational Research Institute through the Odznaka+ platform. The integration of digital credentialing within the Integrated Skills Strategy 2030 demonstrates strong potential for connecting higher education, labour-market needs, and technological infrastructure.

Across these countries, several shared patterns emerge. All four countries are linking their developments to the European Qualifications Framework (EQF) and the Council Recommendation on a European Approach to Micro-credentials (2022), suggesting a growing coherence across Europe. Quality assurance remains rooted in existing higher education systems, but there is a consensus that more tailored standards and recognition processes will be necessary to ensure transparency, interoperability and trust.

At the same time, patterns of challenges emerge. Recognition practices vary widely between institutions, employer awareness in uneven, and many continues to better integrate micro-credentials into broader national data infrastructures. Nonetheless, there is clear momentum toward standardisation, cross-sector collaboration, and digital innovation, supported by European funding tools such as Erasmus+ and the Recovery and Resilience Facility.

Micro-credentials are steadily becoming an integral part of the evolving education and lifelong landscape in Europe, contributing to a more flexible, inclusive, and innovation-driven approach to skills development.

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