



Intelligent printing, flexible and organic electronics Excellence

# D3.2 Guideline on Micro-Credentials in PFOE V1.0

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## Change log

VERSION	DESCRIPTION OF CHANGE
V0.1	First draft to be reviewed by all partners
V0.2	Reviewed version by coordinator Jitka Barm
V1.0	Final version

## Executive Summary

The deliverable “D3.2 Guideline on Micro-Credentials in PFOE” provides a strategic framework for designing, implementing and promoting micro-credentials to address current and future skills needs in the printed, flexible and organic electronics (PFOE) sector across eight European partner countries. Building on the 2022 Council Recommendation on a European approach to micro-credentials and existing initiatives such as Micro Quest, the document translates European-level definitions, standard elements and principles into a sector-specific perspective for PFOE, with a particular focus on vocational education and training (VET) and EQF levels 3–7. It clarifies how micro-credentials should be described (learning outcomes, workload, level, assessment, quality assurance) and positioned within the European Qualifications Framework and national qualifications frameworks of the participating countries, including differences in descriptors such as “skills”, “competence” and “responsibility and autonomy”. The report also highlights the role of European Digital Credentials and the Europass digital wallet as key technical infrastructure for issuing, storing and verifying micro-credentials in a secure and interoperable way.

On the demand side, the guideline draws on INFINITE’s “Industry Gaps & Skills Report”, which analysed 183 survey responses and 107 interviews and found that the PFOE workforce is highly multidisciplinary, with staff coming mainly from electronics, materials science, printing, chemistry and physics, complemented by application domains such as medicine and automotive. This diversity leads to significant skills gaps and a strong need for upskilling, both in PFOE-specific competences and in transversal skills such as AI, English and teamwork, as well as for basic understanding of adjacent disciplines to enable effective collaboration. The sector is described as fast-changing and research-intensive, which reinforces the importance of lifelong learning and flexible, targeted learning offers.

In response, the report proposes a strategy where micro-credentials are designed to be as diverse and flexible as the sector itself, focusing on essential content, clear learning outcomes and alignment with industry needs rather than fixed volumes of learning. It recommends involving companies, social partners, policymakers and learners in co-design and re-evaluating micro-credentials every three to four years to maintain relevance, ideally within a strategic stakeholder network established in INFINITE and expanded in the future (WP5). The guideline outlines how micro-credentials stored in digital wallets can support recruitment and career development by making competences more visible, enabling algorithmic matching and allowing more competency-based selection and interview formats.

Pedagogically, the report suggests designing micro-credentials with differentiated pathways for different learner profiles (e.g. electronics technicians vs. materials scientists), combining shared learning outcomes with tailored entry routes and using online preparatory content and AI-based personalization to accommodate prior learning and non-formal/informal experience. Promotion is identified as a critical success factor: survey data from 765 trainees and students show that opportunities for continuing education strongly influence company choice, yet micro-credentials are still largely unknown in VET, so national authorities, sector clusters and VET providers are called upon to actively raise awareness and experiment with implementation rather than waiting for perfect conditions. To address system-level challenges identified in the NESSET report the guideline advocates establishing an international sectoral committee for PFOE to define needed micro-credentials, coordinate quality assurance, streamline offerings and advise on digital infrastructure.

Looking ahead, the report identifies concrete opportunities within INFINITE's own course portfolio: a 600-hour EQF level 5 functional printing degree in Spain, along with shorter courses at EQF levels 3–7 from several partners, including both technical and soft-skill modules (e.g. innovation and intercultural training) that are strong candidates for future micro-credentials. The project's objective is not to maximize the number of micro-credentials but to demonstrate viable pathways and propose a set of particularly relevant micro-credentials for the PFOE sector; a more detailed proposal is planned in an updated D2.3 report at month 36. Overall, the guideline concludes that micro-credentials, properly aligned with European frameworks, supported by robust digital infrastructure and developed in close partnership with stakeholders, can become a key instrument for building a flexible, future-ready workforce in PFOE and for strengthening the responsiveness of both VET and higher education to rapid technological change.

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# 1. Introduction

Micro-credentials are increasingly regarded as a key element for the future of work and lifelong learning. Following the Council Recommendation 2022/C 243/02<sup>[1]</sup>, a European common framework has been established to guide the creation, recognition, and verification of micro-credentials, as well as to emphasize their importance in education and training systems.

Despite their growing significance, awareness of micro-credentials remains limited across many parts of Europe – “In most countries, however, they are still at an initial stage”<sup>[2]</sup>. Within vocational education and training (VET) in particular, “Micro-credentials tend to fly under the radar, so concentration on their profile and content improves their visibility and transparency”<sup>[3]</sup>. Additionally, several general approaches and guidelines for their implementation already exist<sup>[4,5]</sup>.

This report, therefore, focuses on the mindset and strategies required for the effective implementation of micro-credentials within the printed, flexible, and organic electronics (PFOE) sector. Within work package 5 of INFINITE, relevant stakeholders are identified (T5.1), a strategic network will be established (T5.2), and innovation and entrepreneurial skills training is developed (T5.5). These components provide an ideal foundation for addressing the current lack of awareness and usage of micro-credentials.

The PFOE sector is inherently multidisciplinary, driven by professionals from electronics, materials science, printing, chemistry, and physics, as identified in work package 2<sup>[6]</sup>. Consequently, there is no single “one-size-fits-all” solution for competence development within this field. Different approaches are therefore necessary, as demonstrated in work package 3, which encompasses both full degree programs – such as the EQF level 5 qualification developed by the Spanish partners – and non-degree learning opportunities from partners in Finland, Latvia, and Germany. Based on the curriculum framework (D3.1<sup>[7]</sup>), all educational content produced within INFINITE provides an excellent foundation for framing or designing micro-credentials relevant to the sector.

Moreover, in the PFOE context, it is essential for professionals to possess a basic understanding of adjacent disciplines – knowing what colleagues from other backgrounds do, how they approach challenges, and how their competencies complement one’s own. This underscores the continuous need for upskilling and interdisciplinary learning.

Overall, micro-credentials offer a promising pathway for building the future workforce of the PFOE sector.

The structure of this report is as follows:

- It begins by outlining the essential background knowledge needed to understand micro-credentials, their opportunities, and key recommendations for their design and use.
- This is followed by an overview of the current situation in the PFOE sector.
- Subsequently, a strategy is presented to address major workforce challenges – based on survey and interview data collected within INFINITE – through the use of micro-credentials.
- Finally, the outlook section describes the next steps for advancing micro-credential integration within the INFINITE project.

## 2. Basics on micro-credentials in Europe, especially for the 8 INFINITE partner countries

Based on the Council Recommendation<sup>[1]</sup> and further refined by the Micro Quest project<sup>[4]</sup>, certain definitions and a common conceptual foundation are essential for understanding and working with micro-credentials on a European level.

### Micro-credential<sup>[4]</sup>:

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

### European standard elements to describe micro-credentials<sup>[1]</sup>:

#### Mandatory elements:

- Identification of the learner
- Title of the micro-credential
- Country(ies)/region(s) of the issuer
- Awarding body(ies)
- Date of issuing
- Learning outcomes
- Notional workload needed to achieve the learning outcomes (in European Credit Transfer and Accumulation System – ECTS, wherever possible)
- Level (and cycle, if applicable) of the learning experience leading to the micro-credential (European Qualifications Framework, Qualifications Frameworks in the European Higher Education Area), if applicable
- Type of assessment
- Form of participation in the learning activity
- Type of quality assurance used to underpin the micro-credential

#### Optional elements (non-exhaustive list):

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

According to the Council Recommendation<sup>[1]</sup>, there are **10 “European principles for the design and issuance of micro-credentials”**. For simplicity, only the names of the principles are presented here. They are already very meaningful themselves. The full descriptions can be found in the Council Recommendation. A graphical overview was developed by the project Micro Quest<sup>[4]</sup> which is shown in figure 1.

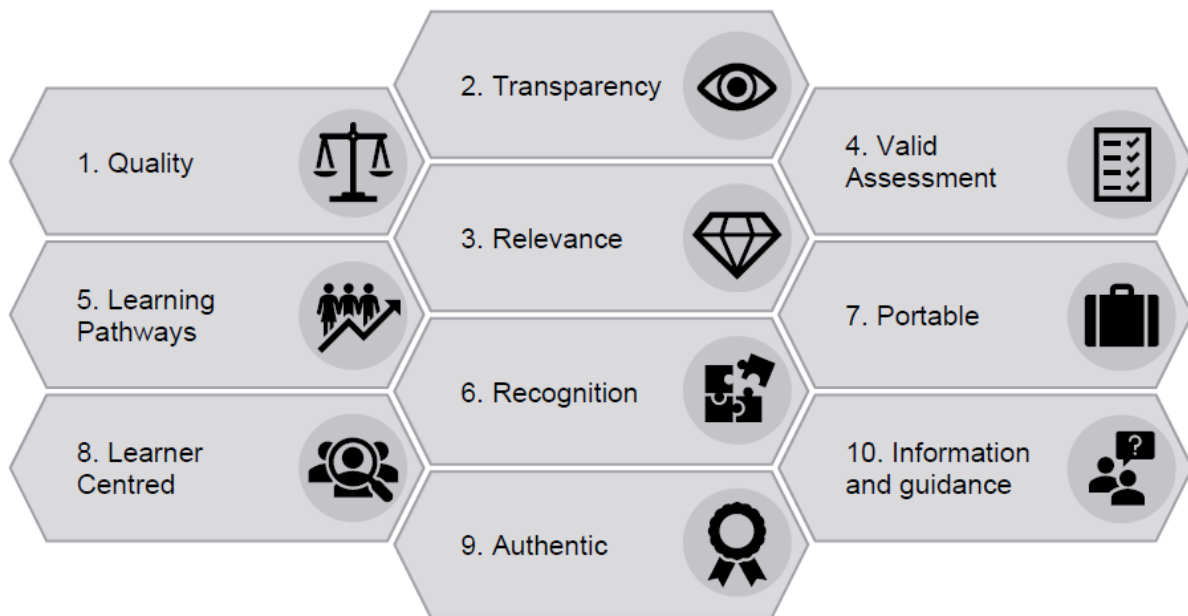


Figure 1: Project Micro Quest<sup>[4]</sup>, [CC BY-SA 4.0](https://creativecommons.org/licenses/by-sa/4.0/)

### The European Qualifications Framework<sup>[8]</sup> and national qualifications frameworks

The European Qualifications Framework (EQF) is an eight-level, learning outcomes-based structure designed to encompass all types of qualifications. Its primary aim is to establish a common reference point – or translation tool – for comparing qualifications obtained across different European countries. As a result, each country interprets and applies the EQF according to its own educational context. It is optional for countries to adopt all eight levels or to modify the structure by reducing or extending the number of levels.

Within the INFINITE consortium, all full partner countries – Finland<sup>[9]</sup>, Germany<sup>[10]</sup>, Latvia<sup>[11]</sup> and Spain<sup>[12]</sup> – have adopted the eight-level EQF structure. The same applies to the associated partner countries Estonia<sup>[13]</sup>, France<sup>[14]</sup>, Greece<sup>[15]</sup> and Portugal<sup>[16]</sup>. Although interpretations of individual levels may vary slightly, their general structure and intent remain comparable. The eight levels cover the full spectrum of learning – from basic education to school level, initial VET, higher VET and academic education, up to doctoral (PhD) level. The INFINITE project focuses particularly on EQF levels 3 to 7.

In the context of micro-credentials, two aspects are especially important. First, the relevance and potential impact of micro-credentials differ across various National Qualification Framework (NQF) levels. Second, key descriptors must be considered carefully. The EQF defines three core descriptors:

“knowledge”, “skills” and “responsibility and autonomy”. The adaptations and national interpretations of these descriptors across the eight INFINITE partner countries are presented in Table 1.

Table 1: Descriptors of 8 European countries regarding the corresponding NQF<sup>[9-16]</sup>. Deviations from the EQF are marked in underlined italics.

Country	Descriptors in the corresponding NQF			
Finland	Knowledge	Skills	<u>Competences</u>	<u>Their interrelationship</u>
Germany	Knowledge	Skills	<u>Social competence</u>	<u>Autonomy</u>
Latvia	Knowledge	Skills	<u>Competences</u>	
Spain	Same as EQF			
Estonia	Same as EQF			
France	Knowledge	<u>Expertise</u>	Responsibility and autonomy	
Greece	Knowledge	Skills	<u>Competence</u>	
Portugal	Knowledge	Skills	<u>Attitudes</u>	

All eight countries have adopted the EQF descriptor “knowledge.” Furthermore, seven out of the eight countries have also adopted the descriptor “skills.” The only exception is France, which replaced it with “expertise,” thereby “emphasizing the importance of evaluation of competences and the desire to give an operational dimension to levelled qualifications”<sup>[14]</sup>.

For the descriptor “responsibility and autonomy,” differing interpretations and underlying philosophies exist among the participating countries. Consequently, this aspect is particularly important to consider when defining micro-credentials, as it plays a key role in ensuring their portability across national contexts.

### Technical basics and digital infrastructure

For technical implementation, standardized data formats and models are essential. Nevertheless, various approaches exist within this field. Since this report focuses on strategies for the use and implementation of micro-credentials in the context of PFOE, only the European Digital Credentials and the corresponding Europass are referenced<sup>[17]</sup> – particularly as they provide the functionality to store credentials in a learner’s digital wallet.

This framework is built upon the principles and concepts outlined in the current section. It employs an electronic seal to ensure the integrity of issued credentials and is based on a multilingual European standard, known as the European Learning Model.

### How long is a micro-credential?

Currently, there is no standardized definition of the duration of a micro-credential. A micro-credential may range from a few hours to several hundred hours of learning. From an academic perspective, it is often recommended that micro-credentials align with the length of standard academic modules, typically equivalent to 2 to 5 ECTS credits<sup>[18,19]</sup>. This approach supports the concept of accumulating micro-credentials toward the attainment of a full degree.

However, the definition of one ECTS credit is not entirely uniform – it can represent between 25 and 30 hours of learning<sup>[20]</sup>. Consequently, a micro-credential requiring 150 hours of learning could correspond to 5 ECTS (30 hours per ECTS) or 6 ECTS (25 hours per ECTS), depending on the institute.

In the field of vocational education and training (VET), the European Credit System for Vocational Education and Training (ECVET) was developed by the EU to introduce a comparable credit logic. To date, this system has not been widely implemented across Europe. Although many pilot projects have explored its use, ECVET has yet to achieve broad adoption<sup>[21]</sup>.

#### **Additional remarks**

In the field of micro-credentials, numerous additional aspects must be considered when designing and issuing genuine credentials. Certain elements may vary between countries or even regions, while others differ across professional fields depending on qualification frameworks and sectoral requirements. This holds especially for the awarding body(ies), type of assessment and integration/stackability options.

It is therefore important to emphasize that this report does not aim to provide a comprehensive review of all literature and standards related to micro-credentials. Instead, it presents a perspective shaped by the INFINITE project and focused specifically on the context of the PFOE sector.

### 3. Current situation regarding the workforce in the field of PFOE

At the outset of the INFINITE project, an extensive data collection phase was conducted to identify the current problems, needs, and expectations within the PFOE sector. The findings, derived from 183 survey responses and 107 interviews, are documented in the “Industry Gaps & Skills Report” (D2.2)<sup>[6]</sup>.

Based on this data, it can be concluded that the PFOE sector is highly diverse. No single profession or field of study currently satisfies all the demands placed on skilled workers. In many areas, effective performance within PFOE relies on the collaboration of professionals from multiple disciplines who combine their expertise to address the complex challenges of the field.

This multidisciplinary workforce primarily stems from backgrounds in electronics, materials science, printing, chemistry, and physics. However, additional domains – particularly those related to the application of PFOE technologies such as medicine, automotive engineering, and others – also play a significant role.

A substantial need for upskilling has been identified<sup>[6]</sup>. This need arises both from the multidisciplinary nature of the sector and from the growing demand for competencies not directly tied to PFOE itself, notably in areas such as artificial intelligence (AI), English language proficiency, and teamwork. Understanding the roles, methods, and perspectives of colleagues across different fields is viewed as essential for optimizing workforce potential. As a result, there is a significant demand for foundational cross-disciplinary knowledge.

Moreover, the PFOE sector is characterized by rapid technological change, like other contemporary technology-driven industries. An open-minded approach to innovation is therefore important for success in this domain. Since research activities constitute a core element of daily operations for many PFOE companies, continuous learning and a mindset oriented toward lifelong learning are integral to sustaining competitiveness and progress in the sector.

## 4. Strategy to address the most important issues in the field of PFOE by using micro-credentials

Micro-credentials represent a promising approach to addressing the current challenges within the PFOE sector. While complete degree programs – whether vocational education and training (VET) or academic studies – would be beneficial, such as the EQF level 5 degree developed by INFINITE partners in Spain, the rapid pace of change in PFOE makes it difficult (but not impossible) to keep degree programs consistently up to date. Furthermore, vocational specialists will likely need to acquire additional skills beyond their initial qualification, irrespective of whether it is at EQF level 5 or higher. It is important to recognize that a full degree related to the field provides an ideal foundation for gaining further PFOE-specific competencies. Consequently, micro-credentials must reflect the sector's diversity.

To fully leverage the potential of micro-credentials, it is recommended to focus on essential content and allow each micro-credential to be as extensive as necessary. Once micro-credentials become widely adopted and field-specific degrees gain broader relevance, they can be restructured to better align with full-degree curricula. Nevertheless, it is expected that micro-credentials will always need to be tailored to industry needs to maintain their relevance.

Developing and updating micro-credentials should involve all relevant stakeholders, including companies, social partners, policymakers, and learners. It would be beneficial to re-evaluate existing micro-credentials at stakeholder level every three to four years. This periodic review would ensure that micro-credentials retain maximum value, particularly given their alignment with company expectations. This approach is supported by the INFINITE project's goal of creating a strategic network (WP5, T5.2 – *Establish a Strategic Network Building with business-education partnerships*) among stakeholders. In the context of VET, close collaboration between education and industry leads to improved learning experiences for trainees and students, ensuring that what they learn remains directly relevant to workplace demands.

The concept of micro-credentials and their collection in a digital wallet offers multiple advantages. First, they can be easily gathered and stored. Second, as recruitment processes become increasingly digital, displaying the acquired micro-credentials helps both job seekers and employers – facilitating visibility through algorithmic matching. Third, during job interviews, candidates can use micro-credentials to demonstrate their skills and experience directly. This may even transform interview formats: knowing beforehand which skills a candidate possesses can allow employers to design problem-solving tasks that simulate workplace conditions. In the long term, well-established micro-credential systems may enable employers to specify preferred combinations of technical and soft skills for new positions.

Once a sufficient range of micro-credentials is established within PFOE, it may become possible to construct degree programs from them – shifting from the current model of adapting micro-credentials to degree requirements. This “micro-credential-based degree” structure would ensure alignment with industry needs, if the micro-credentials have been designed that way beforehand. Provided that degree regulations remain open to technological evolution, such a system could be maintained over time, even as micro-credentials are revised. This approach could be particularly promising for VET, which tends to be more adaptable than academic systems. The potential need for integrative content connecting individual micro-credentials to form a degree should be evaluated as this process evolves.

Within the PFOE sector, it may be advantageous to design different versions of micro-credentials to accommodate diverse learner profiles. For example, an electronics technician may seek advanced

knowledge of printed circuit boards (PCBs) involving conductive inks, while a materials scientist in the same field may approach the subject from a different perspective. Since their backgrounds and workplace needs vary, a single standardized solution may not be effective. Dividing micro-credentials into foundational and advanced components enables flexibility: learners share a common learning outcome but follow pathways tailored to their starting points. This can be visualized as a tree structure in which varying entry routes converge toward a shared endpoint. Online preparatory materials and the use of AI could further personalize these learning pathways. As micro-credentials emphasize learning outcomes rather than delivery methods, this approach also validates non-formal and informal learning, potentially reducing the time required to complete credentials.

Active promotion of micro-credentials across multiple channels is essential.

- Firstly, European countries should improve awareness campaigns, particularly within VET, where understanding of micro-credentials remains limited. The INFINITE project's survey of 765 trainees and students revealed that even at an early career stage, "opportunities for continuing education and training" strongly influence company choice. Micro-credentials could provide such opportunities; however, if they remain unknown or unavailable, they cannot enhance the attractiveness of VET.
- Secondly, industry clusters representing the PFOE sector should promote micro-credentials among companies. With INFINITE cluster representatives – from PFOE and related fields – active in eight European countries, the project provides an excellent platform for strengthening the role of micro-credentials. From INFINITE's perspective, it is crucial to move forward with implementation, even imperfectly, rather than delay and risk losing momentum.
- Thirdly, VET providers should take a proactive stance toward implementing micro-credentials. Although initial steps may involve uncertainty or trial and error, once general procedures are established, further implementation will become progressively easier – credential by credential.

Ideally, an international committee comprising diverse partners should be established to identify, evaluate, and promote relevant micro-credentials across the PFOE sector. The NESET report<sup>[23]</sup> outlines four major challenges in scaling up micro-credential use:

1. Complexity of micro-credentials offering.
2. Constraints in the recognition and quality assurance of micro-credentials.
3. Lack of understanding of what micro-credentials are.
4. Lack of trust in some micro-credentials.

An international committee could effectively address all four challenges. Challenge 4, the issue of trust, could be resolved immediately by ensuring that micro-credentials are developed from the sector, for the sector, enhancing legitimacy. Challenge 3, limited understanding, could be overcome through targeted communication at the company level, increasing awareness among the existing workforce. Challenge 2, concerning recognition and quality assurance, could be mitigated by leveraging the committee's cross-national expertise and shared interest in maintaining high standards. Finally, Challenge 1, the complexity of offerings, could be addressed by streamlining and contextualizing micro-credential structures in alignment with sector philosophies. Additionally, the committee could support educational institutions in implementing micro-credentials by providing guidance – particularly regarding the digital infrastructure required, which may initially appear complex.

## 5. Outlook of possible micro-credentials in the INFINITE project

The courses developed within the INFINITE project are highly diverse in scope and level. The first and most comprehensive example is a 600-hour EQF level 5 degree program in functional printing, designed by the Spanish partners. This program holds significant potential for modularization into several micro-credentials once it has been fully tested and evaluated.

In addition to this degree, INFINITE includes the development of multiple smaller courses ranging from EQF level 3 to level 7. These courses cover both introductory topics – such as the basic modules developed in Germany and Latvia – and more advanced content, as seen in modules from Germany and Finland.

Particularly noteworthy are the soft-skill components, such as the innovation training designed by the Finnish partners and the intercultural training developed by the German partners. These courses present strong opportunities for the creation of targeted micro-credentials that complement the technical aspects of the PFOE field.

The international nature of the INFINITE project provides a valuable opportunity to integrate best practices and content across participating countries. This collaborative approach ensures that the proposed micro-credentials will be as relevant and comprehensive as possible.

Although some INFINITE modules have already entered the implementation and testing phase (WP4), the main development workload will commence in the second half of the project. Consequently, defining specific micro-credentials becomes most appropriate after the testing and evaluation of these modules. It is important to note that the primary goal of INFINITE is not to produce micro-credentials but rather to outline viable pathways and identify those credentials most relevant to the PFOE sector. Accordingly, the updated version of deliverable D2.3, planned for month 36, will include a more detailed specification of the micro-credentials recommended for implementation within this field.

## 6. Conclusion

Micro-credentials constitute a promising and necessary instrument for addressing current and future skills needs in PFOE, provided they are designed with clear learning outcomes, aligned to European and national frameworks, and supported by appropriate digital infrastructure and quality assurance. Their effectiveness depends on strong stakeholder involvement, regular review, and active promotion to increase awareness and trust, particularly in VET and among companies in the sector. By using INFINITE's curriculum framework and international network, and by building a sectoral committee and micro-credential structures that reflect the diversity of learners and workplaces, the project can lay a robust foundation for scalable, industry-relevant micro-credentials that may later feed into full qualifications.

## 7. DEGREE OF PROGRESS

Due date for D3.2 is 28th of February 2026.

Degree of progress is 100%.

There are no milestones related to this deliverable.

## 8. REFERENCES

- [1] Council of the European Union; Council Recommendation (EU) of 16 June 2022 on a European approach to micro-credentials for lifelong learning and employability 2022/C 243/02. Retrieved January 31, 2026, from [https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=OJ%3AJOC\\_2022\\_243\\_R\\_0002](https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=OJ%3AJOC_2022_243_R_0002).
- [2] Cedefop (2023). Microcredentials for labour market education and training: microcredentials and evolving qualifications systems, p. 138. Luxembourg: Publications Office. Cedefop research paper, No 89. <http://data.europa.eu/doi/10.2801/566352>
- [3] Poulidou, A. (2024). Exploring the emergence of microcredentials in vocational education and training (VET), p. 39. Publications Office of the European Union. Cedefop working paper series, 22 <http://data.europa.eu/doi/10.2801/671358>
- [4] Verein Auxilium (Ed.). (2023). European micro-credentials: A guideline for vocational education and training providers (Micro Quest – Innovative Quality Evaluation Strategy for Micro-credentials in non-formal VET in Europe, Project No. 2021-1-AT01-KA220-VET-000025399). <https://www.micro-quest.eu>
- [5] European Training Foundation. (2022). Guide to design, issue and recognise micro-credentials. European Training Foundation.
- [6] INFINITE Project. (2025). D2.2 Industry Gaps & Skills Report.
- [7] INFINITE Project. (2026). D3.1 Curriculum Framework.
- [8] Council of the European Union; Council Recommendation (EU) of 22 May 2017 on the European Qualifications Framework for lifelong learning and repealing the recommendation of the European Parliament and of the Council of 23 April 2008 on the establishment of the European Qualifications Framework for lifelong learning 2017/C 189/03. Retrieved February 06, 2026, from [https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32017H0615\(01\)&from=EN](https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32017H0615(01)&from=EN).
- [9] Cedefop. (2025). European inventory of national qualifications frameworks 2024: Finland. Cedefop. <http://data.europa.eu/doi/10.2801/7801720>
- [10] Cedefop (2023). European Inventory of National Qualifications Frameworks 2022 – Germany. <https://www.cedefop.europa.eu/en/country-reports/germany-european-inventory-nqfs-2022>
- [11] Cedefop. (2025). European inventory of national qualifications frameworks 2024: Latvia. Cedefop. <http://data.europa.eu/doi/10.2801/7473409>
- [12] Cedefop. (2025). European inventory of national qualifications frameworks 2024: Spain. Cedefop. <http://data.europa.eu/doi/10.2801/0683337>
- [13] Cedefop (2021). European inventory of NQsF 2020 – Estonia. <https://www.cedefop.europa.eu/en/country-reports/estonia-european-inventory-ofnqfs-2020>
- [14] Cedefop (2023). European Inventory of National Qualifications Frameworks 2022 – France. <https://www.cedefop.europa.eu/en/country-reports/france-european-inventory-nqfs-2022>
- [15] Cedefop. (2025). European inventory of national qualifications frameworks 2024: Greece. Cedefop. <http://data.europa.eu/doi/10.2801/7850118>

- [16] Cedefop (2023). European Inventory of National Qualifications Frameworks 2022 – Portugal. <https://www.cedefop.europa.eu/en/country-reports/portugal-european-inventory-nqfs-2022>
- [17] European Commission. (n.d.). European Digital Credentials. Europass. <https://europass.europa.eu/en/european-digital-credentials> accessed February 06, 2026.
- [18] Sanchez Barrioluengo, M., Biagi, F., & Di Pietro, G. (Eds.). (2025). Micro-credentials in higher education: Are they boosting digital and green skills for the twin transition? Publications Office of the European Union. <https://data.europa.eu/doi/10.2760/0157920>
- [19] German Rectors' Conference. (2023). Micro-credentials at higher education institutions: Strategic development and quality assurance. Results of the Micro-Credentials Expert Group (1st ed., revised translation).
- [20] European Commission: Directorate-General for Education, Youth, Sport and Culture, ECTS users' guide 2015, Publications Office of the European Union, 2015, <https://data.europa.eu/doi/10.2766/87192>
- [21] Cedefop (2016). ECVET in Europe: monitoring report 2015. Luxembourg: Publications Office. Cedefop research paper; No 56. <http://dx.doi.org/10.2801/946187>
- [22] INFINITE Project. (2026). D2.3 Identification of skill gaps and future skills.
- [23] Orr, D., Pupinis, M., and Kirdulytė, G. (2020). 'Towards a European approach to micro-credentials: a study of practices and commonalities in offering micro-credentials in European higher education', NESET report, Executive Summary. Luxembourg: Publications Office of the European Union. doi: 10.2766/392761