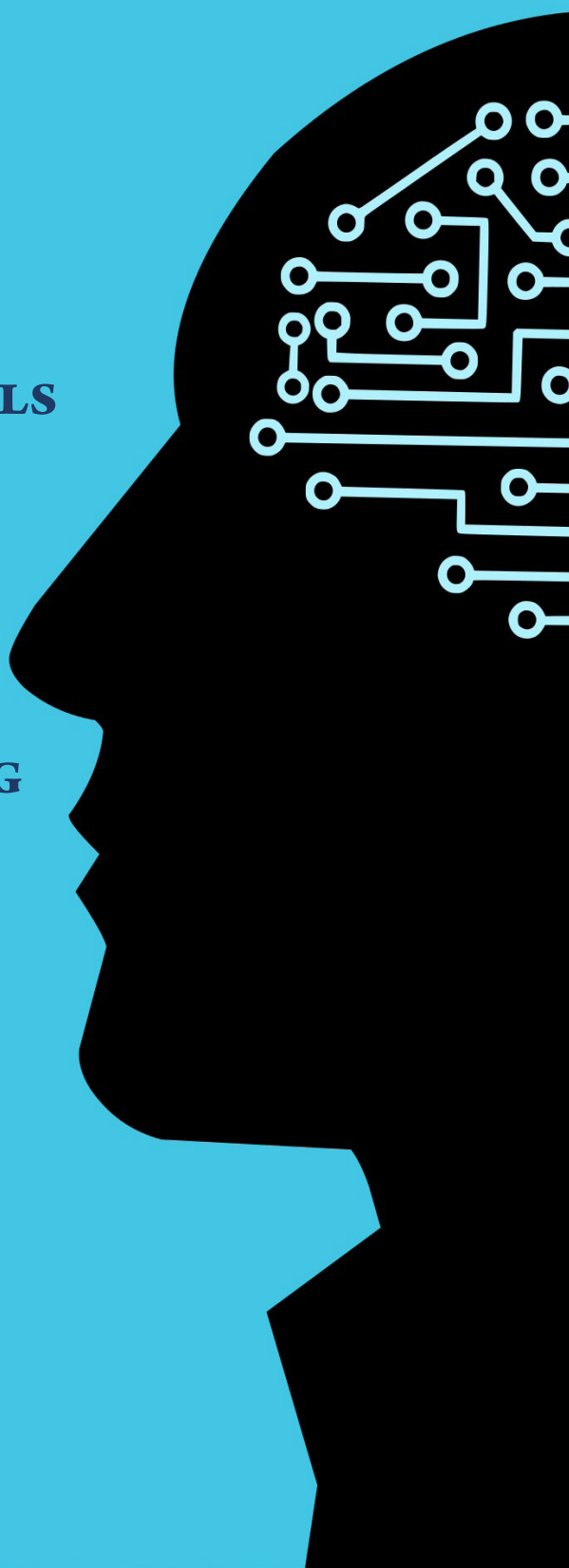


**UNDERSTANDING  
MICRO-CREDENTIALS  
IN NON-FORMAL  
ADULT LEARNING  
AND  
EDUCATION:  
MAKING LEARNING  
VISIBLE**

**Paolo Federighi  
Sturla Bjerkaker  
Francesca Torlone**



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Learning and Education:  
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The guide has been considered as a reference by two countries, Italy and Norway. In both countries, there are ongoing processes aimed at defining national strategies for the adoption of a policy aimed at introducing micro-credentials.

This publication reflects the views only of the authors, and the European Commission cannot be held responsible for any use which may be made of the information contained therein.

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## Summary

The introduction of micro-credentials is slowed down by the resistance of those institutions holding the “certification power” to recognise the role of actors providing non-formal adult learning and education opportunities and developing skills not included in qualification frameworks. On the other hand, there are private players in the local and global free education market who may prefer a condition of complete autonomy, either for economic interests or for ideological reasons of opposite nature. This is the rationale behind this study.

This report aims to understand the meaning and the various options related to the adoption of a micro-credential system that addresses the demand for competence development through non-formal adult learning and education (ALE). It begins by recognising the existence of a “de facto system” in which numerous providers, including global ones, operate and then identify the key components of its functioning. The analysis seeks to understand how public policies can intervene by defining a governance model that is as inclusive as possible.

The focus then shifts to the quality assurance mechanisms that public policies can introduce to enhance the signalling value of the issued certifications and to protect the investments of businesses and citizens. The study further examines the different possible approaches to quality assurance for micro-credentials, the quality standards of the issued certifications, the learning supply, the learning/training providers, and the information services.

This study is based on desk analysis work, taking into account reports produced by international organisations, national commissions, and research groups. This was complemented by consulting the websites of governments and private organisations that already offer micro-credentials (links are updated as of January 10, 2025). Its writing was accompanied by several focus groups that were taken with experts and representatives of Norwegian and Italian national and regional government institutions.





## Introduction

In short: Micro-credentials is a system for recognition of organised short learning and education activities based on certain standard qualities, regardless of suppliers.

Is it possible to learn anything in two - three minutes, and afterwards receive a certificate describing what and how you have learned? Learning – as anything else – takes time. Why does a student stay at university campus for three, five to six years or more to achieve a BA, MA or PhD-degree? Because learning takes not only time, but also *maturation*. Because learning is also about understanding. It is about the Humbolt philosophy of *bildung*<sup>1</sup>. It is also about what in Jacques Delors Four Pillars of Learning: *Learn to know, Learn to do, Learn to live together and Learn to be*<sup>2</sup>. Basic children's education starts as a broad and manyfold knowledge carpet. You should learn to be a mature human being. The further you go, the narrower are your choices of knowledge. And the shorter an educational activity, the shorter is the sustainability – the endurance. This is a risk also for micro-credentials; it will be like a product at your daily shopping: "Should be used before...", "Best before...".

In such a context, short educations stand contradictory to the broad "Humboldt *bildung*" tradition, which also could be expressed by the quoting "The wisdom is what you have left when you have forgot what you have learned" (Skinner 1964, 484).

But anyway, for employers as well as for employees learning often takes too much time and it is wrong dimensioned. It takes more time than they can afford. They could have solved their learning needs in three hours, three days, or three weeks, or three months at the most. And why not? This kind of "spitted learning" becomes more and more common, more and more needed, as time is limited. But so far, quite much of this kind of short and mixed learning processes lack recognition. This is why we introduce a certain system for recognition of short learnings, short courses, in other words micro learning. Kinds of proofs, kinds of certificates for this kind of "short learnings", "micro education" could be developed – locally as well as nationally. We name in this guide this system for certifying "short learnings" as "micro-credentials".

Kompetanseforbundet  
Oslo in March 2025

<sup>1</sup> Alexander von Humboldt (1769-1859) was a German naturalist and explorer, well known for his popularisation of science and his broad perspectives of knowledge and *bildung*.

<sup>2</sup> The former European Commission president Jacques Delors (1925-2023) edited "The Treasure Within" in 1996 where these four learning pillars are quoted.



# 1. Short learning and non-formal education activities for adults in Norway and in Italy

Non-formal adult education has a number of participants greater than the number of students in the entire formal education system (including higher education).

Table 1 - Participation rate in non-formal education and training. Age class 25-64. Year 2022.

Italy	34,1
Norway	55,5

Source: Eurostat trng\_aes\_100\_\_custom\_14921308

Participation in non-formal adult education decreases significantly after the age of 55. This means it primarily involves the active workforce.

Table 2 - Participation rate in non-formal education and training by age. Year 2022.

AGE (Labels)	From 18 to 24 years	From 25 to 34 years	From 35 to 44 years	From 35 to 54 years	From 45 to 54 years	From 55 to 64 years	From 55 to 69 years
Italy	42,2	41,6	36,8	35,3	34,2	26,5	22,0
Norway	58,7	65,0	58,4	57,3	56,3	40,7	35,7

Source Eurostat trng\_aes\_101\_\_custom\_14921531

Participation in non-formal education is job-related in 4 out of 5 cases. This further emphasizes the role of non-formal adult education in relation to the aspirations and needs for upskilling, reskilling, and personal development connected to the world of work.

Table 3 - Participation rate in job-related non-formal education and training. Age class 25-64. Year 2022.

Italy	28,2
Norway	44,1

Source Eurostat trng\_aes\_120\_\_custom\_14921624

The mean instruction hours spent by participants in non-formal education and training range between 95 hours per year in Italy and 102 hours per year in Norway. In both cases, the data show how the objectives of upskilling, reskilling, and personal development in relation to the labour market are pursued

through short-duration activities (some of which are already subject to forms of certification).

Table 4 - Mean instruction hours spent by participant in education and training. Year 2022.

TRAINING (Labels)	Formal and non-formal education and training	Formal education and training	Non-formal education and training
Italy	133	405	95
Norway	192	446	102

Source Eurostat trng\_aes\_151\_\_custom\_14921787

These data show how participation in short-term, job-related non-formal education activities is already a phenomenon involving millions of citizens in both countries.

The Eurostat Survey data do not provide precise indications about the number of short learning activities that have issued certifications to participants. However, it is known that this practice is widespread, and numerous types of short-term activities already exist that include the issuance of certifications attesting the skills acquired.

In fact, short learning and education activities based on certain standard qualities (micro-credentials) are already present in the non-formal adult education market in both countries. This occurs, for example, due to initiatives promoted globally by Big Tech Companies, as well as by some of the traditional large IT industries. By way of example, some types of micro-credentials are listed below, grouped according to the type of provider and the audience targeted:

- Some large tech companies directly offer the public a range of short training opportunities that conclude with micro-certifications. For example, Google, Microsoft, and Amazon have created online platforms where customers can complete professional certification programmes. This phenomenon also extends to in-person training and is practiced by many corporate universities (Festo Didactic operates in both countries, offering technical education in the fields of digitalisation and electrification).
- There is also a number of providers specialising in short courses and micro-credentials. One of the first to operate in this field was the Cisco Networking Academy, offering courses covering a wide range of topics such as cybersecurity, programming, and the Internet of Things (IoT). The courses vary in duration, delivery methods, and language options, covering different skill levels. Other operators present in both markets include:
  - Coursera (MasterTracks, Professional Certificates, Specialisations, and University Certificates)

- edX (MicroBachelors, MicroMasters, Professional Certificates, Professional Education, and XSeries)
- FutureLearn (Academic Certificates, ExpertTracks, Micro-credentials, and Programmes)
- Kadenze (Programmes)
- Udacity (Nanodegrees)
- Many tech companies have also created specific micro-credentials to train their internal workforce. IBM, Microsoft, and Adobe, for example, actively use digital badges for this purpose. This phenomenon is also widespread in other industrial sectors and involves related companies as well (a form of B2B training).
- Various types of providers are engaged in sectoral plans (e.g., ICT) for the training of low-skilled personnel. The Amazon Web Services re/Start initiative<sup>3</sup>. It provides 12-week courses. The programme is free to the learner and focused on helping unemployed or underemployed individuals launch a new career. AWS re/Start's collaborating organisations support underrepresented groups, minorities, displaced individuals, young people, and more.
- In other cases, training providers themselves design and deliver short-term learning opportunities in collaboration with other stakeholders, including leading organisations in the specific sector under consideration, associations, and companies. Colleges and universities, for instance, collaborate with businesses to design micro-credential programmes tailored to industry needs.
- At the same time, various companies have worked in partnership with training providers to offer short-term learning opportunities on new content. For example, the training provider Udacity has developed its “nanodegrees” in partnership with companies like Facebook, Google, AT&T, Cloudera, and Salesforce (OECD 2024a).

Additionally, the following cases should be taken into consideration:

- Regulated professions, which include learning pathways both for entry into the profession, leading to qualifications, and for maintaining membership requirements. Continuous professional development may be mandatory by law.
- Non-regulated professions, which may require the possession and maintenance of professional qualification standards necessary for association membership, as well as certification of compliance with the technical standards of the profession set by UNI.
- Professions covered by the offerings provided by the Chamber of Commerce system.

<sup>3</sup> <<https://aws.amazon.com/it/training/restart/>> (2025-04-14)



## 2. Emergence and definition of micro-credentials

### 2.1 Certified short-term training

The attention towards “micro-credentials” constitutes a relatively new and constantly growing phenomenon.

The reasons for this attention are multiple and, probably, all significant. However, compared to the history of adult education, the only truly new elements lie in the fact that micro-credentials respond to a widespread need strongly present in today’s labour market. Furthermore, they are an important component of the adult learning market, and their use by ICT companies enhances both their commercial relevance and their diffusion through digital networks.

However, it would be wrong to think that this is a new phenomenon. The use of short and certified training activities is part of the history of adult education. Historical studies provide clear evidence of this. For instance, we do not refer here to the instructional design work carried out by the best adult educators in England during World War II to meet the constant need to replace airmen killed in battle. In reality, in the British Army, the use of short and certified training has been a tradition, at least since the First World War. As early as 1919, the British Army was already experimenting with some of the challenges associated with the transition from traditional school models, which were long and structured with intense rhythms:

At first, teachers were prone to repeat the conditions with which they had been familiar in civilian life, and planned courses of extensive length. It was soon seen that, under Service conditions, it was better to dissect syllabuses and plan short courses of from six to ten weeks, which was as much as most units could foresee (Hawkins and Brimble 1947, 177; also quoted in Gadd 1956).

In these few lines, many elements already appear that are recurring in the history of our times: the difficulty of trainers to adapt to new conditions, the old tools – syllabi and curricula – that risk becoming unusable, and the need to align the time required for training with the life and work schedules of individuals.

It is understandable that it has been written that:

[T]he idea of ‘unbundling’ Higher Education into smaller parcels, functions, and courses has been frequently mentioned in literature since at least 1975, while in European policy making the idea of offering short courses for reskilling has been present since at least 2001 (Hudak and Camilleri 2018, 5).

The rapid evolution of the idea has not allowed time for research into its roots.

The origins of the idea are evidently more distant than one might imagine. However, the historical importance of the European Union’s commitment to defining a policy framework – at both European and national levels – to support the development and implementation of flexible, lifelong re-skilling and upskilling pathways must be recognised. This commitment found its

formulation in the context of the Europe 2020 Strategy and the *2015 Joint Report of the Council and the Commission on the implementation of the strategic framework for European cooperation in education and training* (ET 2020): *New priorities for European cooperation in education and training*. This report particularly states that a concrete issue is “fostering transparency, quality assurance, validation and thereby recognition of skills and/or qualifications, including those acquired through digital, online and open learning resources, as well as non-formal and informal learning”<sup>4</sup>(C 417/34). It is a political document that guides European institutions and national governments in exercising governance functions concerning the emergence of micro-credentials.

## 2.2 An open definition

Since then, we have witnessed a dynamic generation of words and phrases, sometimes adopted as synonyms, some others effectively indicating new concepts. Terms such as the following have entered common usage:

- *Micro-competencies* and *micro-skills*: specific skills that can also be acquired outside long-term educational programmes and that enable the performance of an activity/function.
- *Micro qualifications*: certifications of “competency units”, i.e., “stand-alone” or “self-contained” competencies, obtainable at the end of short educational programmes and corresponding to a qualification applicable in the labour market.
- *Micro certificates*: certifications of short-duration educational programmes.
- *Nanodegrees*: a certified online educational programme that teaches you specialised skills in less time than bachelor’s and master’s degrees.
- *Micro-degrees*: which on average consist of 2-3 items from degree study programmes.

The proliferation of terms is also due to the fact that the term *micro-credentials*, although the most widely used, does not identify a specific object and is not unequivocal. The term may include credentials related to learning outcomes that issue documentation of learning achievements in courses, internships, apprenticeships, and various kinds of training programmes (like military), credit-bearing certificates, licences, badges, nano/micro-degrees, vendor certifications and industry or professional certifications (Pouliou 2024, 6).

It is precisely in relation to the progressively significant role played by the provision of micro-credentials that governments and international organisations have had to pay attention to this concept, transforming it into a tool for the policy of developing a country’s human capital. This is why, albeit with some

<sup>4</sup> <[https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52015XG1215\(02\)>](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52015XG1215(02)>) (2025-04-14)



delay compared to the explosion of the micro-credentials phenomenon, two international bodies have issued recommendations and provided elements for defining public policy approaches to micro-credentials.

In 2022, the Council of the European Union addressed this need by adopting a Recommendation defining the “European approach to micro-credentials for lifelong learning and employability”.

According to the European Recommendation “ ‘Micro-credentials’ means the record of the learning outcomes that a learner has acquired following a small volume of learning” (Council of the European Union 2022, C 243/14). These learning outcomes must be assessed against transparent and clearly defined criteria. Learning experiences leading to micro-credentials have to be 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, might be shared and are portable (in place and time). A micro-credential may stand alone (e.g. one completed course) or it might be combined with several micro-credentials combined to a set of credentials and/or to a wider and larger “common” credential. They are underpinned by quality assurance following agreed standards in the relevant sector or area of activity (Council of the European Union 2022, C 243/14).

In the same year, UNESCO proposed a definition of micro-credentials consistent with that of the European Union:

A micro-credential: is a record of focused learning achievement verifying what the learner knows, understands or can do; includes assessment based on clearly defined standards and is awarded by a trusted provider; has standalone value and may also contribute to or complement other micro-credentials or macro-credentials, including through recognition of prior learning; meets the standards required by relevant quality assurance (UNESCO 2022, 6).

The three fundamental components of both definitions consist of the release of a “record”, which makes the learning outcomes achieved by the learner transparent, “following a small volume of learning”.

The official definition leaves ample room for interpretation in its application. It allows for the possibility of interpreting the meaning of the reference to “learning outcomes”. The prefix “micro-” is associated with “short learning”.

The ambiguity of the definitions is due to the complexity of the micro-credential phenomenon and the existence of a “de facto system” on a global scale, promoted and managed by global actors whose activities are self-ruled (the new concept of freedom!).

Realistic recommendations cannot push governments to create opposing local systems but rather to seek governance models for the phenomenon, avoiding pervasive regulation – neither desirable nor sustainable.

Non-formal adult education can be governed through various types of policies:

- *Substantive*, which involves the adoption of laws establishing the system of rights, duties, regulations, and functions subject to public policies.

- *Regulatory*, dedicated to issuing rules for managing the implementation processes of policies.
- *Distributive*, involving measures determining the beneficiaries of sectoral policy.
- *Redistributive*, involving measures aimed at addressing inequalities in access to learning opportunities and their use for personal and professional growth.

Regarding a public policy on micro-credentials, the governance of the “de facto system” and its extension represents the starting point. For this reason, the type of policy that can have the greatest impact likely involves the adoption of regulatory policies for the system, starting with the rules governing the quality assurance of the various processes and procedures involved.

Governance also needs a strategy to define its objectives and functions in response to the demand for skills expressed by the labour market.

### 2.3 The definition and understanding of micro-credentials in Norway

*Norwegian working life must become better at making visible, utilising and further developing the expertise that already exists among employees in companies and enterprises.*

The project “A Norwegian Approach to Micro-credentials (Certificates of Competence)”<sup>5</sup> was established in the Autumn 2023. The project’s goal was to examine tools that can help highlight and strengthen learning and skills development in working life, independently of, but also in interaction with, the formal education system. The project adopted a new definition of the micro-credential concept, identifying it as “Certificates of Competence” – or “Certificates of Skills”. The final report was launched in June 2024 by Kompetanseforbundet and cooperating partners, called “Competence certificates and competence frameworks: making continuing education visible”.

Specifically, the project has analysed the relevance of the following instruments:

- competence certificates for the visibility of further education and learning in working life;
- industry-related qualification and/or competence frameworks<sup>6</sup> for the systematization and visibility of continuing education and competence development measures;
- competence points for combining and “stacking” results of learning.

<sup>5</sup> <<https://www.kompetanseforbundet.no/nyheter/2024/foreslar-innforing-av-kompetanseattester-i-norge/>> (2025-04-14)

<sup>6</sup> The Report specifies already at the outset, in chapter 1, that it would be misleading to talk about *qualification* frameworks within industries (see detailed clarification in chapter 2). The Report consistently uses the term *competence framework* and thereby signals that the framework is rooted in working life and not in the formal education and qualification system: see Kompetanseforbundet 2024.

The introduction of competence certificates and competence frameworks means framing and highlighting continuing education and competence development initiatives in Norway. The aim of the project has been to clarify which principles can be used as a basis for each of these instruments. The experiences from three industry areas – health and care, water and sewage and cleaning – have been used as an empirical starting point for the discussion. International examples support this. The development of a Norwegian certificate of competence can be based on the formulation:

A certificate of competence makes it possible to describe learning results in a format that is recognisable within, but also across industries and areas of activity. The certificate is based nationally but can be recognised internationally. It can serve employees as well as employers and, where possible, institutions and actors within formal education (Kompetanseforbundet 2024, 12).

The results of learning in working life must be made visible to a greater extent than today, for employees and for employers. The introduction of a joint certificate of competence is, as discussed in chapter 6, an important means of achieving this. The competence certificate can:

- contribute to individuals being able to identify and document their own learning outcomes, so that these can be used to support their own working life or educational career;
- make it easier for employers to get an overview of the individual's competence;
- serve as a tool for documenting the overall competence in a business;
- be designed so that the individual's learning results can also be understood within the education system and, if possible, included as an element, for example, in a real competence assessment;
- be anchored in an industry or activity area but must be recognisable in other industries or activity areas;
- be anchored nationally but also be relevant internationally.

It is crucial that a certificate of competence captures both learning processes and learning results. Although the description of the learning outcomes plays a decisive role in making competence visible and is a prerequisite for combining and “stacking” learning outcomes, it is necessary to clarify, for example, who is behind a course or initiative, what it required in terms of work effort and whether the assessment of the learning outcomes can be trusted. This is crucial for building the important trust that a certificate of competence depends on. The report emphasises that a certificate of competence must satisfy basic General Data Protection Regulation (GDPR) requirements.

The report considers that provision should be made for the development of individual “competence folders” which make it easier for the individual to collect and present competence certificates. Such digital “competence folders” must be anchored in industries and areas of activity but must be based on general

guidelines that ensure transfer and recognition across areas. “Competence folders” can make it easier for the individual to combine and “stack” learning results.

2.3.1 Formal, non-formal and informal learning

As this project focuses on micro-credentials in non-formal education, this is the definition, according to the Norwegian report.

The terms formal, non-formal and informal education and learning are often used to distinguish between learning within the formal education system and other learning. The terms initially say little about what characterises these “other” forms of learning but are nevertheless useful for clarifying features of the overall learning in a society (see also Cedefop 2023).

“Formal Learning” refers to the results of statutory education and training (for example) aligned with a national qualifications framework. “Non-formal learning” is purposeful and intentional but takes place outside the formal system. “Informal learning” is the unintended and unplanned learning outcomes that result from activities in work and leisure (for example – see Cedefop 2023).

These three concepts are useful when compared to prior learning assessment, as they make it clear that important learning does not only happen in dedicated educational and training situations but can happen as a consequence and result of other activities. An assessment of practical competence must therefore embrace each of these three areas.

The relations between the three can be illustrated by this frame (Tab. 5):

Table 5 - Relation between the formal, non-formal, informal learning and connected credentials.

	Public exams	Organised	Not organised	Credentials
Formal learning	X	X		X
Non-formal learning		X		X
Informal learning			X	(X)

2.4 The path towards the governance of micro-credentials in Italy

In Italy, the first platform offering a digital credentialing system for documenting the skills provided to students in the academic system and enhancing their value in the job market has been active for over ten years<sup>7</sup>. Subsequently, other platforms were launched, aimed at all actors in the education

<sup>7</sup> <<https://best.it/>> (2025-04-14)

system and aligned with Digital Credentials standards, including Open Badge 2.x, which facilitate the creation, issuance, receipt, publication, storage, sharing, and management of Open Badges and Certificates, also using Blockchain technology<sup>8</sup>. Furthermore, platforms operating at a global level are active, enabling the issuance and management of digital badges<sup>9</sup>.

In Italy, the groundwork exists for initiating a public policy aimed at the recognition of micro-credentials (Conte 2024). The Ministry of Labour and Social Policies in agreement with the Ministry of Economy has adopted the *New Skills - Transition Plan*. It states that:

It seems necessary to develop smart training solutions and design courses tailored specifically to the specific needs expressed by companies, which allow the acquisition of skills through specific short-term modules, in a flexible, simple, scalable, modular, customizable, adaptable way, different contexts and, therefore, portable. It is necessary to prepare tools for the identification and standardization of such learning, as well as for the evaluation and certification of learning outcomes, also by rethinking and using the tools already in place, operational at a regional, such as those for the valorisation and recognition of prior learning, to make training immediately usable. With the aim of reducing the misalignment between labour supply and demand, with reference to the most specialised profiles, it is necessary to contribute to the greater increasing the opportunities for job placement for those who are unemployed or underemployed, focusing on the levers of qualification and requalification of skills and offering training courses more closely linked to transitions. It also seems useful to strengthen actions to support new ways of learning in the workplace, to strengthen the competitiveness and productivity of businesses and contribute to the efficiency of local production systems (Ministero del Lavoro e delle Politiche Sociali/Ministry of Labour and Social Policies 2024a, 17-18).

The Plan's approach tends to orient towards a definition which conceives micro credentials as "specific short-term modules", "tailored ad hoc to specific company needs", expandable, portable. But no indication is provided regarding the issue of the object of the certifications: learning outcomes. The topic is addressed in other decrees relating to the accreditation of prior learning. However, it must be considered that the introduction of micro credentials will be subject to regulatory interventions by the Italian Regional Governments.

The introduction of micro-credentials would complement the services of accreditation of prior learning. This service is regulated by a ministerial decree (Ministero del Lavoro e delle Politiche Sociali/Ministry of Labour and Social Policies 2024b). It regulates the functions and disciplines, the areas of responsibility of the Ministry of Labour and Social Policies, within the framework of the national system for certification of skills. These services aim

<sup>8</sup> <<https://myopenbadge.com/it/my-open-badge/>> (2025-04-14)

<sup>9</sup> <<https://www.open-badge.eu/>> (2025-04-14); <<https://sanoma.it/>> (2025-04-14)

to open spaces for collaboration in corporate training, between the vocational training system under the jurisdiction of the Regions and the economic and social partnership, enhancing the role of inter-professional funds for continuous training and bilateral funds for training and income integration. These provisions are part of a system that already has an operational framework for the national recognition of regional qualifications, within the framework of the National Register of education and training titles and professional qualifications (Decreto legislativo/Legislative Decree 16 January 2013, n. 13).

The National Qualification Framework (QNQ) (Ministero del Lavoro e delle Politiche Sociali/Ministry of Labour and Social Policies 2023) is the instrument that describes all the qualifications issued within the framework of the national skills certification system, which constitute the entire public offer of lifelong learning and lead to the issuance of qualifications. It coordinates the national qualifications system with those of other countries through their referencing to the European Qualification Framework (EQF). The National Qualifications Framework is essentially focused on descriptions of professional profiles useful for defining the competencies necessary for obtaining degrees and qualifications (Ministero del Lavoro e delle Politiche Sociali/Ministry of Labour and Social Policies 2018). One of its fundamental tools is the “Atlas of Work and Qualifications”: a classificatory and informational device based on the descriptive sequences of the Classification of Economic-Professional Sectors<sup>10</sup>.

Certification Services make use of the different European reference framework of competences in languages (CEFR), for digital skills (DigComp), for entrepreneurial skills (EntreComp), for personal, social and learning skills (LifeComp), and the standards of competences adopted by OECD-PIAAC for literacy and numeracy. GreenComp is not actually mentioned by the Italian Decree, not even ESCO (European Skills, Competences, Qualifications and Occupations).

These components of the implementation device of a micro-credential system have been developed in Italy since the beginning of the century. In 2012, a law was approved that gave impetus to the construction of the system. Despite the commitments there are still a vast variety of types of qualifications and certificates offered outside and independent of the public system.

<sup>10</sup> See article 8 of the Legislative Decree n. 13 dated from 16 January 2013 and article 3, paragraph 5, of the Interministerial Decree dated from 30 June 2015, and articles 13 and 15 of the Legislative Decree n. 150 dated from 14 September 2015.

### 3. Impact forecasts related to the adoption of micro-credentials

Micro-credentials do not have a disruptive role but can increase the effectiveness and efficiency of learning programmes. However, in the collective imagination they have fostered the hope that their widespread adoption may lead to positive impacts (even though these have not been validated by research yet). Public policies will hardly be able to intervene comprehensively in the “de facto system” of micro-competencies, including those provided by Big Tech. Nevertheless, strengthening their governance through quality assurance systems could enhance their alignment with the expectations and training investments of businesses and families (even when training is supported by public funds, public financing never covers all related direct, indirect, and opportunity costs).

The adoption of a governance model that operates through a quality assurance system could produce:

- a. the increase in the supply of skilled workers;
- b. the increase in the supply of adult learning opportunities;
- c. the increase in individual possibilities to improve their learning conditions.

In addition, we must also take into account a possible negative consequence:

- d. The risk of credentialism.

Each of these issues is covered in the paragraphs that follow.

#### 3.1 The increase in the supply of skilled workers

The implementation of European strategies for 2030, and in particular the increase in the employment rate to 78%, is correlated with the increase in participation in adult learning opportunities. In the Porto Social Commitment of 7 May 2021, the European Parliament, the Council of the European Union, the European social partners and civil society organisations endorsed the target that at least 60% of all adults should participate in training every year by 2030<sup>11</sup>.

However, Piac surveys show that “participation” is not a significant indicator (OECD 2024b). Its relevance has also been questioned in other studies (Federighi, Torlone and De Maria 2024). Its increase may not correspond to

<sup>11</sup> <<https://www.consilium.europa.eu/en/meetings/european-council/2021/05/07/social-summit/>> (2025-04-14).



an increase in the quality of participants' learning outcomes<sup>12</sup> (OECD 2024c). The introduction of reliable forms of certification of learning outcomes should be able to increase control over the actual results of participation in adult and continuing education activities. This should increase trust in the training offer and the propensity to participate. However, reducing the duration of the offer of adult learning opportunities and recognising their validity is an objective that can contribute to increasing adult participation. First of all because the increase in participation – to be sustainable – should be supported by the flexibility of the learning supply, also from the point of view of its duration. At the same time, micro credentials should help to “improve the focus on additional skills instead of the outdated focus on new job profiles”<sup>13</sup> and this should favour the adaptation of the workforce to the needs of upskilling.

However, according to data reported by an OECD report from 2023, there would be little consideration by companies regarding the possession of micro-credentials in the hiring of new employees, while they are paying increasing attention and trust towards continuous training and its capacity for upskilling or hybridisation of different professions (6).

[T]he available evidence suggests that the impact of a targeted short-term credential on labour market outcomes depends on course features and learners' demographic characteristics (OECD 2023, 6).

[T]here is evidence that firms attend closely to institutional reputation when hiring, and this has an important bearing on the labour market impact of short-term, targeted credential (OECD 2023, 9).

### 3.2 The increase in the supply of adult learning opportunities

Short learning and non-formal education activities are the type of structured learning offer through which adult learners are trained (we must add to this, informal and embedded learning, whose weight is certainly greater, both from a quantitative and impact point of view). The quantity of this offer present on the adult learning market can be increased by the introduction of a system of micro-credentials. However, this can mainly happen if the formal education sector modifies its training offer and adopts a system based on short-term, modularised, certifiable and stackable offers. So, it is a training provision leading to the achievement of qualifications recognised by the labour market and for which, currently, participation in long-term courses is required.

<sup>12</sup> The extraordinary increase in the adult learning participation rate recorded by Adult Education Survey (AES) has had no effect on the improvement of learning outcomes measured by PIAAC.

<sup>13</sup> <[https://www.skillsea.eu/images/Public\\_deliverables/aug2023/SkillSea\\_strategy\\_summary\\_final\\_DIGITAL-version\\_24-May-2023.pdf](https://www.skillsea.eu/images/Public_deliverables/aug2023/SkillSea_strategy_summary_final_DIGITAL-version_24-May-2023.pdf)> (2025-04-14).



If we take into account that the “duration” of formal education is determined by factors not necessarily connected to the quality of the training offer, it is possible to expect a dynamic that in the medium term could lead to a shortening of formal education and training paths. This phenomenon could be induced by the fact that the adoption of a system of micro-credentials accompanied by the measurement of actual learning outcomes could cause greater efficiencies in the structuring of curricula and the elimination of their segments that generate irrelevant learning outcomes. In fact, we must keep in mind that the determination of the “duration standards” of formal education is the result of decisions not necessarily connected to the expected learning outcomes. The curriculum and duration of formal education are often determined by international standards, by factors linked to local culture and dominant ideologies (in the “ethical state” model, education is first and foremost a tool for propagating dominant values, to which we can add the traditional opposition between disciplines: humanities versus science), by criteria determined by the type and human resources available (an organisation first and foremost uses the trainers at its disposal and teaches what the teachers know). This system shows clear inefficiencies. Research carried out in Italy on the relationship between educational objectives declared by higher education institutions and the actual learning outcomes achieved by students has shown that in many areas (from health to education) only about 30% of students achieve results partially in line with the expected standards (Federighi 2018). This type of research and monitoring programmes were then suspended, probably until a remedy was found.

These data show the existence of several chances for public policies:

- Bringing back into their own skills development policies a wide variety of learning opportunities already on the market of education and training.
- Expanding at low costs the number of adult learning activities delivering micro-credentials and adopting the quality standards required by public policies. This trend may have contradictory effects on the role of adult education activities promoted by civil society organisations.
- It can increase the recognition of the role of providers and non-formal adult education activities. The recognition of micro-credentials in the field of skills for life, soft skills and transversal skills can progressively expand to the recognition of the value of activities promoted by civil associations and volunteering.
- But it can also result in the reduction of the transformative potential, social innovation and margins of autonomy of civil society organisations.

### 3.3 Increasing individual opportunities to improve personal educational conditions

The potential benefits for adults highlighted in the various documents are many. Taking into consideration only the direct ones, the documents considered underline how micro-credentials facilitate the achievement of a formal certificate. The recognition of learning outcomes is argued to have a positive motivational

effect on continuation. This effect would be enhanced by the stackability and portability of micro-credentials.

In perspective, other advantages can be achieved. This depends on the type of evolution of micro-credential policies. The shift of attention towards real learning outcomes can create a system of control of training results. It can allow to evaluate whether the results promised by the providers have been achieved by adult learners. This can be the premise for possible claims for compensation if the learning offer has not allowed the achievement of the promised results.

Finally, the development of learning outcome evaluation models can also lead to the development of awareness of the learning identity by everyone.

However, the OECD report also notes the limits of these possible developments:

There is very little evidence on the outcomes of micro-credentials between different age groups. What evidence does exist implies that labour market outcomes are stronger for learners under 45 (OECD 2023, 10).

### 3.4 The risk of credentialism

The introduction of micro-credentials can increase the risks of “Credentialism”. This policy emphasises the relevance of formal educational credentials above other ways of making transparent human potential. The “signalling” value of credentials has been questioned for decades. Micro-credentials further increase the circulation of certificates. For this reason, it can become increasingly challenging for those without these credentials to find and secure employment, regardless of their qualifications or experience. For human resources professionals, credentialism can present several challenges, including narrowing the talent pool of candidates, creating difficulties in hiring and promoting workers, and potentially leading to discrimination against workers without formal credentials.

As debated (Federighi for the European Commission 2013), the imperative to develop skills implies the need for a sound system for monitoring the possession of skills. Guaranteeing an adequate skills supply means ensuring that the actors on the job market know “who knows what”.

In other words, it demands a system that delineates the actual possession of skills and not just qualifications. Research has shown how qualifications can be more of a barrier for admission to a social class than a function for identifying actual skills (Collins 1979). The main purpose of higher qualifications is not necessarily to denote acquired skills, but rather to limit access to some specific professions. Since what unites a social class is a common culture, education plays a considerable role in transmitting and consolidating this common culture, regardless of the professional capabilities transmitted.

“[The existence of jobs] with higher-level qualifications can lead to a credentialism rather than a more skilled workforce” (Dockery and Miller 2012, 3). Research on the actual linguistic and mathematic skills of 15-year-

olds and PIAAC data, have shown the limits of the accumulation of certificates (credentialism) and the limited importance of qualifications with respect to information about the skills someone actually has.



## 4. Scenarios and basic components

According to the study by Cedefop, four different scenarios can be distinguished for the implementation of micro-credential policies (Tab. 6):

Table 6 - Four scenarios for micro-credentials.

Scenario 1: Supply-driven micro-credentials (as part of formal education) for further learning	Scenario 3: Demand-driven micro-credentials (examples of enterprises/sectors)
Scenario 2: Supply-driven micro-credentials for labour market entry and job setting (professional credentials)	Scenario 4: Micro-credentials for vulnerable groups/groups at risk (upskilling/reskilling)

Source: Pouilou (2024)

This classification distinguishes scenarios according to the systems in which they are adopted: the school and university system, the vocational training system, the continuing education system, the system of social policies and active labour market policies.

This classification helps to frame the different reference contexts that influence the methods of conception and application of micro-credentials. However, it has the limitation of isolating low-skilled adults in an ad hoc scenario. This choice is motivated because it corresponds to social policies. However, it does not consider the contingency that there is the possibility of building a transversal scenario that includes micro-credentials accessible to all population strata.

Nonetheless, the contexts in which micro-credentials are introduced can be relevant as it involves compliance with standards and policies that are specific to each field. Others suggest distinguishing micro-credentials depending on whether some of their main components are there or not. Specifically, micro-credentials may also take different forms depending on seven dimensions:

- (a) types of skills that are measured or assessed (traditional versus new skills);
- (b) duration/time investment required (short versus longer);
- (c) type of provider (formal providers versus new providers);
- (d) market value of the accreditation (high recognition/trust versus low recognition);
- (e) level of involvement with the industry (highly connected/relevant versus low);
- (f) social capital value (high networking versus low network);
- (g) connectivity, i.e. the stackability of micro-credentials (Mateo Díaz et al. 2022, 53).

This analytical approach is useful for those who aim to engage in the design of individual micro-credentials or to describe and classify the existing offer on the training market. However, when one takes the perspective of building a public policy for the adoption of a micro-credential system, the models adopted vary according to the choices made with respect to:

1. *The Regulatory Institutions*: politics involves a single Ministry/more Ministries; a Regional Government; one system (education, higher education and vocational training)/multiple systems (defence, health, justice, etc.).
2. *Associated political measures*: the variety of associated policy measures such as individual right to training, encouragement of access (ILA, vouchers, study permits, tax incentives, etc.); competences requirement and certification (for practicing a profession; for access to funding, etc.); quality assurance approach...
3. *Participants* (e.g., only the weaker groups or everyone) and the “power of free-choice learning” (Bourdieu 1989; Dierking 2005) attributed them the possibilities of self-directed learning (what, why, where, when people decide to learn) and the power of control over the real learning outcomes.
4. *Distribution of costs*: distribution of direct/indirect/opportunity costs between the state, entrepreneurs, families.
5. *Type of learning offer involved*: any type of formal, non-formal, informal educational activity, or limited to certain types and areas (for example non formal education, but only job-related).
6. *Providers*: matching organisational quality standards, or based on the results achieved (learning outcomes, placement, reputation).
7. *Object of the certification*: the correspondence between learning goals of providers and learning outcomes achieved by adults, or even the “actually achieved learning outcomes” by individual learners, or just attendance at the activities.
8. *Marketability of certifications*: limited to other education and training paths, or for career development at work, or at a personal level, i.e. stackability within individual learning pathways, return to “long” training courses, qualification courses, professional development in work.
9. *Personal support services*: the provision of information services (“help desk” and registers), guidance, accreditation of prior learning, self-assessment of skills actually acquired.

Below, we will delve deeper into the analysis of some of the components of a micro-credential system, limiting ourselves to those elements that can increase the innovative function of this measure.

#### 4.1 Approaches to quality assurance of micro-credentials. Different solutions

Quality assurance of micro-credentials can be used as a regulatory measure to introduce forms of governance of the micro-credential offering. However, this is still a practice limited to a narrow number of organisations.

A recent survey across the European higher education sector found that about half of surveyed organisations (mostly higher education authorities and quality assurance bodies) rely on internal quality assurance arrangements, and even this is not done so on a consistent basis. A significant share of European countries currently has no quality assurance mechanisms for micro-credentials offered in the higher education sector, with only 16% of organisations currently conducting quality assurance and another 13% developing approaches to do so in the future (European Association for Quality Assurance in Higher Education 2023, 14).

However, formal adult education and training is generally subject to Quality Assurance (QA) processes, which, in the case of Vocational Education and Training (VET) and within the European Union, are usually aligned with the European Quality Assurance Reference Framework for Vocational Education and Training (EQAVET). In contrast, this is not the case for non-formal adult learning, which is often not subject to any QA framework.

At the moment there is no prevailing model of quality assurance of non-formal adult learning. Three approaches stand out in particular:

1. The *regulatory approach* imposes minimum quality requirements that providers need to meet in order to be allowed to operate or access public funds [in this case, the hybrid approach must also be taken into consideration, which takes both the programmes and the organisations that deliver them as the object of the quality requirements<sup>14</sup>];
2. The *advisory approach* uses guidelines and examples of good practices to inspire providers engaging in quality development efforts;
3. The *organic approach* leaves it completely to providers to define their own quality needs (OECD 2021, 7).

To these options, in our opinion, we should add:

4. The *multiple approach*, differentiated according to the type of micro-credentials, the product sector involved, the type of economic source that finances the activity (business, family, state). In this fourth approach, all the solutions considered above can be adopted simultaneously in the same country. They can be used in a complementary way and vary according to

<sup>14</sup> For instance, in Ireland and New Zealand. More information on accreditation rules for micro-credentials in New Zealand can be found here: <<https://www2.nzqa.govt.nz/about-us/rules-fees-policies/nzqa-rules/qualification-and-micro-credentials/>> (2025-04-14).

the characteristics of the micro-credentials (profile and professional sector involved, topic, level, provider, duration, target, marketability, etc.).

The fourth approach is based on the consideration that regulation is not always possible or desirable. For this reason, governments can adopt a type of approach that best adapts to the different market segments and the needs of the moment.

While some stakeholders believe that non-formal qualifications like micro-credentials should not be over-regulated (in order to ensure that courses remain adaptable to changing skills needs), boosting trust in the system may require integrating micro-credentials (at least partially) into the broader learning environment – and doing so may require the development of some formal quality assurance mechanisms. Countries will need to strike a careful balance between regulation and flexibility, such that there is sufficient (OECD 2024a, 38).

For these reasons a multiple and differentiated approach can be better combined with forms of soft law.

There is then a further choice – the *supervisory approach* – to take into consideration and that concerns the opportunity to define forms of quality assurance both for micro-credential providers and for individual programmes and to identify a central body responsible for providing accreditation. In this regard it has been observed that

accrediting each single program is relatively burdensome, especially for learning institutions offering numerous courses, and could thus limit the speed at which courses can be designed and delivered to learners (OECD 2024a, 38).

The alternative solution is to directly attribute to the providers the responsibility of respecting the quality standards of the programmes they provide and to conduct their own internal quality checks. This is a solution that requires a strong inspection system and the certainty of the application of merciless punishments against the providers and the people responsible for their management.

The *supervisory approach* differs from the regulative approach because it aims to regulate all processes that impact the quality of the offering and learning outcomes (from information to learning outcomes). It also defines consistent control measures and appropriate repressive measures – both administrative and criminal. The supervisory model for the defence of the learning rights of learners and companies adopted by the “SkillsFuture” system<sup>15</sup> of the Singapore Government seems effective. Below there is a summary of the findings of a case of violation of the system’s quality criteria (Tab. 7).

<sup>15</sup> <<https://www.skillsfuture.gov.sg/>> (2025-04-14).



Table 7 - Case study of an errant training provider.

**Training Provider A failed an assessment conducted by SSG because:**

- a) Based on our inquiries, many trainees had not agreed to the sign up of the courses, but Training Provider A's agents had signed up on their behalf without their knowledge.
- b) Training Provider A did not refund the SkillsFuture Credit of many trainees to SSG even though no training was conducted for these trainees.

**Outcome:**

- Training Provider A's contract with SSG was terminated.
- The company and its director/shareholder were placed on a blacklist. The placement of the director/shareholder on SSG's blacklist will prevent the individual and his companies from obtaining SSG funds in future.
- SSG is recovering funds disbursed to Training Provider A.
- The case may be referred to Commercial Affairs Department for further investigation against the company and the people involved.

Source: Archives of Training Partners Gateway<sup>16</sup>.

In Europe today there are numerous quality assurance systems that cover non-formal adult learning and that use a wide variety of tools. We list some of them: Ö-Cert and Cert NÖ (Austria)<sup>17</sup>, Qualiopi (France)<sup>18</sup>, the European Quality Mark (Iceland)<sup>19</sup>, Quality and Qualifications Ireland (Ireland)<sup>20</sup>, Label de Qualité (Luxembourg)<sup>21</sup>, the Offering Quality Education to Adults model (Slovenia)<sup>22</sup>, EduQua (Switzerland)<sup>23</sup>, the NRTQ Quality Label (the Netherlands)<sup>24</sup> and the ISO quality labels 21001, 29992, 29993 and 9001.

<sup>16</sup> <<https://www.tpgateway.gov.sg/resources/regulation/enforcement-actions>> (2025-04-14).

<sup>17</sup> <<https://oe-cert.at/>> (2025-04-14).

<sup>18</sup> More information on the Qualiopi system in France can be found here: <<https://travail-emploi.gouv.fr/formation-professionnelle/acteurs-cadre-et-qualite-de-la-formation-professionnelle/article/qualiopi-marque-de-certification-qualite-des-prestataires-de-formation>> (2025-04-14).

<sup>19</sup> <<https://hac.is/en/gaedamal/>> (2025-04-14).

<sup>20</sup> <<https://www.qqi.ie/>> (2025-04-14).

<sup>21</sup> <<https://guichet.public.lu/fr/entreprises/sectoriel/horeca/label-horeca/label-wellkomm.html#:~:text=Le%20label%20de%20qualit%C3%A9%20W%C3%ABllomm%20alcoo-liquess%20ou%20non%20alcoo-liquess>> (2025-04-14).

<sup>22</sup> <<https://www.acs.si/en/projects/national/offering-quality-education-to-adults/>> (2025-04-14).

<sup>23</sup> <<https://alice.ch/en/eduqua/>> (2025-04-14).

<sup>24</sup> <<https://www.nrto.nl/>> (2025-04-14).

## 4.2 The object of certification

The ambition of micro-credentials is to certify what a person knows, can do and understands and the individual's independent use of knowledge and skills. However, there is a crucial ambiguity in micro-credential systems that concerns the choice of their object, of the “what” they certify. There are cases of certifications that attest to:

- participation in a training activity alone (focusing on the inputs to learning – when, where and how it took place);
- the conformity of what has been learned with the learning aims of the training activity (often identified with individual learning outcomes, but capable of measuring above all the effectiveness of “teaching”. This approach draws attention to what an individual knows, can do and understand following a sequence of learning);
- the real individual learning outcomes, or the positive or negative consequences of what has been learned (sometimes made transparent with tests, more often entrusted to the ability of adults recognised as self-directed learners. This approach is the most suitable for capturing the qualities of a learning process and grasping the effects and consequences of learning at work, or other non-formal or informal settings).

These ambiguities weaken the signalling value of certifications. These limits are also highlighted in a study by Cedefop:

the distinction between micro credentials and other short skills certificates is often unclear, leading to difficulties in evaluating their content and usefulness for employers as well as the return for students/employees. There is no transparent process in the learning outcomes and assessment of a micro-credential: while qualifications are increasingly described in terms of learning outcomes, the same approach could be followed for micro credentials as information on their content needs to be clear and easily accessible to individuals, learners and workers. It is not apparent how assessments are conducted or how rigorous the programmes are, relying on the credibility of the credential and the training provider. Learning outcomes differ in length, level of detail as well as orientation (Pouliou 2024, 9).

The proposal put forward in the Report “A Norwegian Approach to Micro-credentials (Certificates of Competence)” (2024) provides that certificates issued in the micro-credentials system should be structured through descriptors referring to three main elements:

- Firstly, it is necessary to describe the overall aim of the course/activity and what kind of context it is part of. Such a concise presentation should enable the reader to grasp the core of the learning and understand the context in which it is part of and what the purpose is, for example in an industry context and set against a potential competence framework.

- Secondly, it is necessary to clarify the width [...] and/or the extent of the learning outcome in question. In practice, this will involve describing the kind of theoretical knowledge, practical skills and/or general competence involved. Description of breadth is about identifying the extent and boundaries of a knowledge or competence area and showing what a learning outcome includes and does not include. This description will be able to rely on and reflect any competence frameworks and their balance points and key competences.
- Thirdly, it is necessary to describe the depth [...], complexity and/or level of the relevant learning. Within one and the same area of knowledge, skills or competence, there will necessarily be different degrees of complexity and achieved expertise. A novice in a professional field is not expected to have achieved the same results as an experienced employee. While a competence framework can act as a reference for the description of depth/complexity, these descriptions can rely on established methodology within the field (Kompetanseforbundet 2024, 48-49).

#### 4.3 Quality standards for the provision of certifications

According to the evaluation of a Report by Cedefop, in all countries the presence of independent actors that provide them with certifications is widespread:

[They are] non-state regulated qualifications and might refer to private qualifications, sectoral or professional/industrial qualifications and certificates (that are used by a sector, a profession or group of professions) or international qualifications (Pouliou 2024, 21).

Some of these certificates have a value within a chain value and are sometimes defined and requested by the leader of each individual chain. Other examples may refer to certifications issued in the name of the Project Management Institute and which attest to the possession of skills corresponding to a wide variety of project management functions, or to the International Coaching Federation (ICF)<sup>25</sup>, a hub for all things coaching that oversees and manages the credentialing of individual coach practitioners and oversees and manages the accreditation and approval of coaching education providers.

The delay public policies are intervening in the field of micro-credentials is due to the fact that their certification delivery models have been built mainly for national formal education and training systems, mainly oriented towards the delivery of qualifications and professional qualifications for young people in transition from school to the labour market. As it has been argued:

Qualification frameworks are mainly rooted in the formal education system and arrange (classify) qualifications based on level defined through learning outcomes. In most cases, the qualifications are specified as knowledge, skills and general competence, exemplified by the degree of autonomy and responsibility.

<sup>25</sup> <<https://coachingfederation.org/about/the-icf-ecosystem>> (2025-04-14).

The starting point is thus the qualification's content and profile, that is, what a person is expected to know, be able to do and understand when taking the exam (Kompetanseforbundet 2024, 19).

To solve this problem, in some cases the strategy is to integrate micro-credentials into the National Qualification Framework (NQF):

For countries that decide to integrate micro-credentials into their NQF, an understanding of the credit point value of micro-credentials is first required. New Zealand and Ireland are two countries where micro-credentials are integrated into the NQF. Micro-credentials are first designated credit point values and then assigned to levels on the NQF. They can be taught at multiple levels of an NQF based on their relationship to other qualifications. Each qualification level of an NQF is also typically associated with a set of learning outcomes and competences, which facilitates learner mobility by allowing learners to move between institutions, levels and programmes (OECD 2024a, 45).

A similar solution was also adopted in Sweden with the introduction of the *Branschvalidering* (Swedish National Agency for Higher Vocational Education 2021) – a sector specific qualification and validation model – and its frame within the Sweden's national qualifications framework (SeQF)<sup>26</sup>, a framework for classifying and organising qualifications.

With *Branschvalidering*, validation is carried out in the industries. Validation of specific vocational qualifications can also be linked to levels in SeQF, by the actors developing the validation model applying to *Myndigheten för yrkeshögskolans* (the Swedish Agency)<sup>27</sup> for level placement. The process for developing competence standards<sup>28</sup> is divided into four distinctive steps:

- first, identifying work tasks and competence areas for the occupation, the industry's occupational roles and then work with an industry model for one or more occupational roles;
- second, defining core tasks and sorting them in competence areas;
- third, defining learning outcomes for skills needed to perform core tasks;
- forth, defining learning outcomes for knowledge, responsibility and autonomy to match the skills and core tasks.

<sup>26</sup> <<https://www.myh.se/in-english/seqf>> (2025-04-14).

<sup>27</sup> Swedish National Agency for Higher Vocational Education. The main area of responsibility includes Higher Vocational Education (HVE) in Sweden. The key function is to ensure that HVE programmes meet the labour market's needs for qualified workforce. The Agency analyse the labour market, decide which programmes qualify to be offered as HVE, allocate government grants, conduct reviews, produce statistics and promote quality improvement in HVE.

<sup>28</sup> As support for industry organisations, the process is documented in Kvalitetskompassen, <<https://minasidor.myh.se/kvalitetskompassen>> (2025-04-14).

The process of developing a competence standard according to the 4-step model is mainly managed by the social partners related to the specific industry sector. A formal placement in SeQF requires that the learning outcome descriptions are linked to the descriptions in SeQF.

The industries themselves can work on the development of validation models, with the support of the Swedish Agency. The validation models in the various industries are based on the same standards and guidelines, given by *Myndigheten för yrkeshögskolans*, but must at the same time be adapted to the needs and issues in the specific industry. Individual adaptation to the industries results in different models, while the standard ensures that the same requirements for quality assurance and documentation are maintained.

In addition to the sector-based approach, Singapore has also introduced a complementary strategy aimed at activating programmes for enterprise clusters. In this model, industry-leading companies, known as “SkillsFuture Queen Bee” companies, actively identify and address skill gap – not only by training their own employees but also by supporting the wider ecosystem of small and medium-sized enterprises (SMEs).

In other cases, an ad hoc solution could be used: a public register for micro-credentials and digital badges. In Poland, the Educational Research Institute (IBE) is implementing the Odznaka+ (Badge+) project, which aims to create a public registry of micro-credentials and digital badges. The inclusion of micro-credentials in the registry is based on meeting specific requirements. The Badge+ application is available to individual users who wish to certify their skills and abilities while meeting the specific criteria to obtain a digital badge. The app can also be used by organisations, companies, or universities. Additionally, it provides users with a digital portfolio, allowing them to create and share their digital credentials<sup>29</sup> (OECD 2024a, 44).

A similar model is adopted in Singapore through the “SkillsFuture Series” continuous training programme, which offers a wide range of short, targeted courses on emerging skills to support rapid upskilling and reskilling. These “lightning courses” allow a large number of workers to quickly update their skills in real-time in new fields (e.g., AI fundamentals, sustainability, etc.). The Certificate of Competency (COC), issued by accredited providers, is recognised within the Singapore Workforce Skills Qualifications (WSQ) framework. Many local companies recognise this certification as proof of acquired skills, making it useful for career advancement or new job opportunities.

In Norway, the Report by Kompetanseforbundet (2024) provides for an additional solution. Non formal adult and continuing education “aimed at working life should not be included in the formal qualification framework” (8). According to the proposal by the Report:

<sup>29</sup> Further information on Odznaka+ is available here: <<https://odznakaplus.ibe.edu.pl/>> (2025-04-14).

Continuing education and learning in working life can be made visible and strengthened through the establishment of industry-based one's competence framework, which identifies and describes the key competences within central roles <sup>30</sup> (Kompetanseforbundet 2024, 8-9).

The development of a competence framework must be based on a recognised need in the industry and on dialogue between employers and employees. The development of a competence framework should be based on common guidelines and “toolboxes” that can be used to guide and inspire, but not override, individual industries. Industry-based competence frameworks can form a starting point for dialogue with competence providers and make it easier to register relevant continuing education offers on an ongoing basis (Kompetanseforbundet 2024).

The adoption of solutions for the integration of micro-credentials at national and local level constitutes the basis for their portability both in training courses and in the labour market at international level. The recognition of micro-credentials at international level can promote international workforce mobility.

#### 4.4 A self-directed validation approach to learning outcomes

An inspiring solution with significant innovative potential is the model implemented in France through Pix<sup>31</sup>. Pix is an example of an online skills validation service. It could also be used by “customers” to verify the quality of their learning and its correspondence to what is proposed by training providers. Each micro-credential provider could be invited to make a self-assessment device available to learners that can also be used to verify the actual achievement of the expected learning outcomes.

Pix is a public online service that allows the assessment, development and certification of digital skills. Users can test their level in five areas of the European Digital Competence Framework. Official certification is available after passing a test for each skill and level. The Pix tests cover the new Digital Skills Reference Framework (cadre de référence des compétences numériques - CRCN) based on the European DigComp framework for better recognition of certification at European level and to facilitate student mobility, students and professionals. Pix aims to become the standard for the assessment and certification of digital skills for professionals<sup>32</sup>.

A higher-impact solution has been introduced in Singapore, where the Skills Profiler platform has been made available to companies. This platform,

<sup>30</sup> A Competence framework is rooted in working life and/or limited functional areas and defines the kind of knowledge, skills and general competence an individual or an organisation needs to be able to perform a task, role or profession adequately.

<sup>31</sup> <<https://pix.fr/>> (2025-04-14).

<sup>32</sup> <[https://www.pedagogie.ac-nantes.fr/medias/fichier/dp-certification-pix-competences-numeriques\\_1569915935027-pdf/](https://www.pedagogie.ac-nantes.fr/medias/fichier/dp-certification-pix-competences-numeriques_1569915935027-pdf/)> (2025-04-14).

in addition to helping certify workers' on-the-job skills, also serves to identify corporate training needs through diagnostic tools.

#### 4.5 Learning activities

Micro-credentials may be the result of a learning offer designed to achieve specific certifications connected to a specific competence of a professional figure or a work context.

Public quality assurance policies may define minimum standards of competence relating to specific programmes, or general minimum standards that must be adopted by all types of training activities.

The minimum standards that concern the funded and non-funded training offer are generally inspired by commercial law and tend to protect the weaker party, the consumer of training (these are rules that concern, for example, value and costs, privacy, number of hours, etc.).

As regards the definition of standards of competence to which training programmes must conform, four different situations can be referred to:

- *Mandatory training*: there are micro-credentials whose components (learning outcomes, duration of training, topics, type of teachers, methods...) are defined by public authorities. Compliance with the standards is mandatory and only under this condition can the certifications required at the end of the training course be issued (courses for the training of the sustainability manager, for the person responsible for safety at work, for gender equity...).
- *Statutory training*: it tends to respond to the demand for skills from companies. Many believe that programmes that are specifically linked to in-demand or growing industries show better outcomes (in terms of employability). In these cases, the training project is built in response to the demand for skills from companies and therefore in close and continuous collaboration with potential employers and through social dialogue. The method of designing tailor-made, customised micro-credentials is used in more structured companies (large and small, perhaps with their own self-managed training schools). In some cases, companies have also managed to create models of micro-credentials exported to other companies and offered on the training market.
- *Statutory training in the public sector and professional orders*: in the public sector, a training supply management strategy is often implemented within multiple "walled gardens" corresponding to the functions of each individual public authority (school, justice, army, public administration...). Each public authority has its own scope and sometimes its own training system managed with its own standards. A similar situation concerns the "walled gardens" connected to specific professional figures belonging to professional orders.



- *Upgrading of specific professions:* finally, the existence of a demand for adaptation of existing qualifications with the addition of new units of skills must be taken into account (a process that affects for example all professions that evolve in a green perspective) and the emergence of new professions and the need to provide for the hybridisation of the old ones. These two needs are expressed by various production sectors (maritime, transport, for example). The stakeholders of the labour market or by organised actors of civil society are committed to defining minimum training standards that specific micro-credentials should conform to.

A fifth case is transversal and concerns all adult and continuing education activities issuing micro-credentials (non-formal education included). The quality control of the training offer is directed towards the definition of standards for the curriculum. The model adopted by Singapore provides that the curriculum design proposed by the provider must:

- exhibit consistency between the instructional methods, assessment methods and intended learning outcomes;
- fully cover the relevant technical skills and competencies and/or critical core skills under the relevant skills framework or other reference documents (e.g. competency standards);
- if it is for WSQ (Workforce Skills Qualifications), reflect that such WSQ Qualification will be offered in blended learning mode;
- incorporate at least two assessment methods which is consistent with the instructional methods and learning activities (SkillsFuture Singapore Agency 2024).

There are many problematic aspects connected to these options, and it is legitimate to have doubts about their effectiveness. Here we limit ourselves to stress one question: in all European countries there is a huge shortage of adult learning professionals<sup>33</sup>. Which guarantees can be provided by an accreditation or recognition system that cannot seriously take into consideration the quality of adult learner's professionals?

The State of Singapore has addressed this issue by requiring trainers assigned to the course to fulfil the applicable requirements (Tab. 8). These rules must be followed by training providers issuing certifications under the Workforce Skills Qualifications (WSQ) which is a national credential system that trains, develops, assesses, and certifies skills and competencies for the workforce.

<sup>33</sup> See the European Survey in Torlone 2023. Chapters on Norway (97-106) and Italy (87-97).



Table 8 - Adult Educator Qualifications Requirements.

Types of Registered Training Provider	Type of Adult Educator	Requirements
Public WSQ Registered Training Provider	Curriculum Developer	All must have Diploma in Adult and Continuing Education (DACE) or Diploma in Design and Development of Learning for Performance (DDDLP) or its equivalent.
	someone who conducts training and/or assessment	At least 80% with Advanced Certificate in Training and Assessment (ACTA) or Advanced Certificate in Learning and Performance (ACLP) qualification or their equivalent.
In-House WSQ Registered Training Provider		At least one WSQ Master Trainer and one curriculum developer with full ACTA or ACLP or equivalent.

Source: SkillsFuture Singapore Agency 2024, 37.

#### 4.6 Suppliers

The policy that allows learners to transfer learning taking place in different settings also involves an inevitable expansion of potential providers of adult and continuing education and skills (from the capacity for technological innovation, to skills for life, to language, to culture, to professional growth). This is a principle that should make it possible to overcome the oligopolies that accompanied the “ethical state” – typical of authoritarian states and illiberal democracies – and new forms of global technocratic domination over learning processes. The configuration of open systems in which the role of real actors is recognised perhaps can be favoured by the adoption of a policy of micro-credentials. However, it is possible to observe the adoption of choices oriented towards two complementary options:

- The adoption of control measures of providers that can include the recognition of the role of providers of micro-credentials recognised to:
  - Those who meet standards and quality criteria defined by public or private authorities and who are therefore accredited as suppliers.
  - The reputation accumulated due to the results achieved. In these cases, other procedures prevail compared to the tools and procedures typical of accreditation systems, such as: the public balanced score card, customer satisfaction, company satisfaction, return on investment (ROI), evaluation models.
  - Training companies: in this regard, an attempt is underway to emulate and transfer by adaptation the model of training companies that manage the training processes of young workers based on standards approved by the company, unions and governments (the benchmark is constituted by cooperative universities of Baden-Württemberg).
- The recognition of different learning contexts as potential providers of micro-credentials, as well as of certifiable skills (in addition to workplace learning,

we refer to civic service, volunteering, etc.). New contexts can be legitimised in delivering learning producing competences.

In Singapore, to operate as a “Registered Training Provider” (RTP) it is necessary to comply with the requirements of “Training Provider Quality Assessment”<sup>34</sup>:

- Course Administration and Corporate Governance: they ensure the Registered Training Providers has processes to provide administrative support to learners (including Learner Communication and Management of Feedback, Requests, and Appeals, Pre-course and Post-course Advisory Service, Administration Systems, Corporate Governance, Management of Marketing Staff and Agents, Processes for Tracking and Monitoring Organisational Outcomes).
- Course Quality Assurance: it ensures the RTP has processes to design and develop content, monitor standards and effectiveness of delivery to meet stipulated learning outcomes (in particular: System on course quality assurance; System to screen/profile learners to ensure that course is fit for purpose; System for Adult Educator Management; Plan-Do-Check-Act System).
- Outcomes: they track organisation and course quality outcomes (including Organisational Outcomes and Training Outcomes).

There are three possible quality grades from Training Provider Quality Assessment:

Grade 1: Good organisation and course quality with good training outcomes.

Grade 2: Above average organisation and course quality with above average training outcomes.

Grade 3: Poor organisation and course quality. Deregistered entity may reapply to be a new RTP after 12 months.

#### 4.7 Adult learning professionals

In countries where specialised adult continuing education professionals are available, training interventions may be required to mandatorily involve, in addition to content specialists, three types of specialists (in hierarchical order):

- *Curriculum Developer* must hold a Diploma in Adult and Continuing Education (DACE) or a Diploma in Design and Development of Learning for Performance, with a duration of 2 years.

<sup>34</sup> <[https://www.tpgateway.gov.sg/plan-courses/training-provider-quality-assessment-\(tpqa\)](https://www.tpgateway.gov.sg/plan-courses/training-provider-quality-assessment-(tpqa))> (2025-04-14).

- *Trainers and Assessors* are generally required to have an Advanced Certificate in Learning and Performance, with a duration ranging between 6 and 9 months.
- *Master Trainer*: a true training strategist responsible for:
  - Developing advanced training strategies.
  - Designing large-scale learning programmes.
  - Coaching and mentoring junior trainers.
  - Evaluating and improving training quality.

To take on this high-level role, significant professional experience in managerial positions is required, along with participation in a dedicated Master Trainer Programme.

#### 4.8 Marketability

As stated by the European Recommendation: “Micro-credentials are owned by the learner, can be shared and are portable. They may be stand-alone or combined into larger credentials” (Council of the European Union 2022, 14).

In other words, this recalls the market value recognised to the certification, that is, its marketability for different purposes and in different contexts. Micro-credentials do not replace other forms of qualifications, but they can also have an upskilling function and be used in the traditional qualifications system. They can potentially be used by adults to:

- Re-enter “long” training courses and courses that provide a professional qualification.
- Promote professional development in work or entry into the labour market.
- Promote personal development and one’s personal training identity (basis of professional identity).

The micro-credential expendability in different contexts (system and occupational family) and modular possibility of combinations of partial or special qualifications (minor, supplemental, special purpose and professional awards) must take into consideration also its duration/validity (expiring date).

Micro-credentials are also – but not only – proposed as a solution for the construction of learning paths built through the accumulation of credits, stackable (almost the metaphor of Lego). This possibility can be relevant for building a learning path, the result of an intentional design, which allows combinations of micro-credentials with a broader qualification, formally recognised. In other words, it is a function that designs a “second way” to the achievement of formal certifications. If we consider that, according to the OECD, the opinion of entrepreneurs is that the longer the programme, the better the outcomes (2024a, 6), this function becomes relevant. Obviously, it cannot be generalised to all potential users, but it should be a common feature of many certifications.

This function requires the definition of “inter-provider credit exchange agreements” (European Training Foundation 2023, 11). As stated by European Training Foundation (ETF):

The most automatic route involves recognition of a micro-credential using an established credit-exchange agreement between the education and training institutions involved. Where no such agreement exists, micro-credentials may be recognized through the procedures for recognition of prior learning (RPL). In each case, recognition might enable a learner to be admitted, progress through or complete a study program on the basis on micro-credentials earned at another learning institution (2023, 40).

The ETF report takes into consideration three forms of inter-provider credit exchange agreements: automatic recognition, ad hoc recognition, free electives.

The digitalisation of micro-credentials can enable and promote their portability. This solution can ensure that students have control over their micro-credentials and can use them in their career. This requires that micro-credentials are issued according to a structured data format for credentials (such as the European Learning Model), to ensure interoperability.

Furthermore, the exchange value of each individual micro-credential affects its marketability. The value varies depending on the system in which the micro-credential can be used. In formal systems and university systems in particular, the criterion of measuring value based on the workload expressed through a system of points (European Credit Transfer and Accumulation System [ETCS] corresponding to 25 hours of learning), attributed to teaching modules, applies. Each ECTS is built according to specific learning goals to which learning outcomes should correspond. In these systems, the number of hours of learning is a fundamental criterion in attributing the value of teaching modules.

Regarding the marketability of micro-credentials issued at the end of non-formal learning pathways, three opportunities can be distinguished:

- Contexts in which the possession of micro-credentials is required by law (mandatory training) or by companies (statutory training).
- The labour market and social networks in which micro-credentials can be assigned a value, serving as a signal for the possession of skills or status. Reference can be made to the skills included in the Global Skills Taxonomy of the World Economic Forum, used, for example, in Singapore. A large part of the taxonomy’s entries is not yet included in formal adult and continuing education pathways. Similar considerations can be made regarding the various European competence frameworks (starting with Life Skills).
- In work environments that pay more attention to the skill assets of individual organisations, the “employees’ potential assessment” only marginally considers the qualifications held by individuals. In these cases, what is evaluated is the combination of work performance, behaviours, demonstrated emotional intelligence, and their potential performance in areas that demand different skills. The set of micro-credentials held can be used to assess the

latent qualities that the employee possesses but has not made available to the organisation yet. From this perspective, what carries weight is the real skills possessed and practiced. The length of the training experience matters, but its value is determined by the potential future work experience in which the individual worker may be engaged.

#### 4.9 Marketplaces and online information on the offer of micro-credentials

The introduction of a system for micro-credentials poses a problem of information to citizens on the learning opportunities available, on the programmes suitable for their needs, on the real learning outcomes, on the feedback of participants regarding their relevance and above all on the employment results after obtaining and fulfilling micro-credentials.

The existence of the possibility of preventive access to information on the qualitative components of the continuous training offer is the basis for allowing businesses and citizens to make informed choices. The importance of this type of service is connected to the fact that the efficacy of micro-credentials depends on finding the right programme for the right learning profile (OECD 2024a).

Information on the learning offer, on its characteristics (expected learning methods and outcomes, expendability, storability, total costs, etc.) represents a big challenge for public policies. Training offer is usually advertised on the websites of the providers.

Centralized, micro-credential ‘marketplaces’ or hubs are in limited use across countries – this is often because these platforms first require a significant data collection exercise (OECD 2024a, 35).

There are, however, some interesting examples that could inspire new practices:

- Digital platforms and advocacy efforts in the non-profit sector have given rise to Digital Promise, a global non-profit that has created a micro-credential ecosystem in partnership with educational institutions to personalize continuing education. It has created a Credential Explorer that allows users to browse and filter a large collection of education-focused micro-credentials using intuitive criteria. The user interface displays credentials as nodes in a network, highlighting complementarities between credentials associated with a particular subject matter and contributing to their stackability. Since 2023, Digital Promise has created a Badging Coalition, where industry experts and practitioners are conceptualizing the design of a new open-source badging solution that will help with the recognition and transferability of user learning.
- Another example is the service created in the USA by Credential Engine, a non-profit organisation whose mission is to map the landscape of credentials, qualifications and skills with clear information, stimulating the creation of resources that allow people to discover and pursue the learning and career paths that are best for them. It has produced the Credential Registry that

contains detailed information on all types of credentials and skills in an easily accessible format. Users can explore skills, learning and employment outcomes, up-to-date market values and career paths, and reference data on credential attainment and quality assurance from schools, professional associations, certification organisations, the military and more.

- In addition to platforms, non-profit organisations can also be initiators of broader advocacy efforts. The World Alliance for Micro-credentials is an upcoming collaborative initiative between European VET associations and experts in a variety of education and training-related fields. Its missions include raising awareness, setting minimum standards, and facilitating dialogue between authorities and training institutions.
- In the framework of the activities promoted by the European Commission, there are modelling studies that could provide useful indications<sup>35</sup>.

The private market of micro-credentials remains the most powerful source of information active on the web with advanced information and marketing models<sup>36</sup>. According to the OECD it is possible to track the growth of micro-credentials offered through major learning platforms, such as Coursera and Future Learn, and this reveals a swift expansion of micro-credential offerings (OECD 2024a).

For the purposes of protecting the “consumer”, there are governments that have introduced Marketing Guidelines that aim to prevent advertising activities that seek to unfairly influence potential applicants. These Guidelines – in the case of Singapore – concern means advertisement of any.

Registered Course or Listed Course accessible by or published to the public or any section thereof, and this may include (without limitation) notices, circulars, pamphlets, brochures, prospectus, television advertisements, radio advertisements, internet advertisements, placards, newspaper advertisements, magazine or journal advertisements, and verbal announcements; and includes advertisements published by third parties (SkillsFuture Singapore Agency 2024, 28).

The Guidelines, for example, prohibit the use of terms that may influence the choice of the potential applicant. It is prohibited to use terms such as “funded” or “accredited”, “free”, “paid by the government” (even if they correspond to the truth). It is prohibited to provide any referral awards/rewards; conduct any lucky draws; provide gifts or vouchers. It is prohibited to request for SingPass login passwords or user IDs from Trainees/Applicants or prospective Trainees/

<sup>35</sup> <<https://ralexila.eu/>> (2025-04-14). This project work in the frame of European Learning Model (ELM) which supports also the sharing and dissemination of electronic data (<<https://europa.eu/europass/elm-browser/index.html>> [2025-04-14]).

<sup>36</sup> See for Germany <<https://hoch-und-weit.de/>> (2025-04-14) and for Ontario <<https://www.ecampusontario.ca/>> (2025-04-14).

Applicants of Registered Courses or Listed Courses. It is prohibited to secure any employment opportunities for Trainees/Applicants (SkillsFuture Singapore Agency 2024, 29).

The primary function of Registries is to improve accessibility to learning opportunities within a system of integrated services having functions far broader than those of traditional catalogues.

Nowadays Registries can generate information that enriches data on labour market trends, skill demand and learning outcomes. They can help ensure that training programmes meet the needs of citizens and businesses.

For decision-makers, through their monitoring functions Registries provide a powerful tool that supports a data-driven decision-making process. As stated in the European Commission's Communication "The Union of Skills" (2025), this type of mechanism can be used to establish a national skills observatory capable of ensuring informed policymaking and effective funding.

The detailed information Registries collect on participation rates, on programme' outcomes and on participants' demographic characteristics enable just-in-time evaluation of existing policies and the design of targeted interventions.

In conclusion, adult learning and education Registries may also include the recognition and validation of non-formal learning. Studies conducted show that all this is possible<sup>37</sup>.

<sup>37</sup> <<https://ralexila.eu/>> (2025-04-14).





## 5. Conclusions

The size of the “de facto system” of micro-credentials is so developed that it cannot be entirely brought under the control of state authorities. It responds to a demand for skills development present in the labour market. Focusing solely on the part of the system that can be integrated into formal education qualifications would reduce the functions of public policy.

The hypothesis emerging from this study is that public policies could intervene through quality assurance mechanisms to ensure that companies and adult learners, in general, receive quality services from the various providers. They could also aim to guide the supply in response to the current and future demand for skills.

The first issue to address concerns the choice of a national/international framework to support the micro-credentials system.

Their inclusion in National Qualification Frameworks can enhance the marketability of micro-credentials within formal education systems. This option would encourage the use of micro-credentials to increase workers’ participation in higher education pathways. However, it would limit eligibility to micro-credentials aligned with the ECTS system.

Their inclusion in a wider National Competence Framework would promote the spread of micro-credentials more oriented toward learning outcomes corresponding to the demand for new skills in the labour market.

Employers tend to identify skill-based hiring as one of the most important current trends in human resource management [...]. It is not the micro-credentials that are recognized but rather the skills and competencies contained within those micro-credentials (European Training Foundation 2023, 45).

This option has a greater and more rapid capacity to respond to the dynamics of evolving professions, their needs for updates, hybridisation, and career mobility.

A system that includes both solutions – either as alternatives or in a complementary manner – is probably the most efficient solution.

A second issue concerns the choice of the goal of public governance policies. Micro-credentials are consumer goods primarily produced by private providers operating at a local and global level. Their production, distribution, and delivery take place within an ever-expanding market. A regulatory intervention also serves the function of protecting consumers of educational products from the various local, national, and global economic actors. Safeguarding the interests of companies and adult learners implies the adoption of measures that require effective operation of services and control tools and the implementation of rules discouraging illegal and dysfunctional behaviour.

There is significant room for institutions to take a cooperative governance initiative aimed at strengthening the quality of training provision and the real learning outcomes of participants. While it is true that training programmes have diverse characteristics, making them difficult to fit into a single framework

suitable for formal education, the wide variety of cases can be grouped into four types of activities, based on the type of credentials they can issue.

A new regulatory framework could recognise the existence of non-formal education activities aimed at achieving:

- Qualifications, as these activities may issue stackable certifications.
- Stand-alone certifications, recognised in the labour market.
- Learning credentials that contribute to the personal and professional development of workers.
- Attestations that exclusively meet the personal interests of the participant.

For the governance of the sector, a basic regulatory intervention involves key decisions regarding:

- Defining a process that, starting from the demand collection from beneficiaries (citizens and businesses), leads to short-term priorities aligned with emerging skill needs and professional dynamics.
- Establishing specific Competence Frameworks, supported by new digital tools capable of responding just-in-time to emerging skill demands.
- Quality assurance models, particularly concerning:
  - The delivery of training activities.
  - The operational capacity of providers.
  - The competencies of trainers.
  - The issuance of certifications.
- Monitoring tools that can be implemented within the marketplace for non-formal education.

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