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# EXPLORING THE EMERGENCE OF MICROCREDENTIALS IN VOCATIONAL EDUCATION AND TRAINING (VET)

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# Keywords

Microcredentials; qualifications; vocational education and training; learning outcomes; skills; competences; upskilling; employability.

# Summary

The qualifications and credentials landscape is changing across Europe and beyond, aiming to increase flexibility and allow learners to transfer learning taking place in different settings: in education and training, at work, during leisure time and at home. The supply of microcredentials and short skills training courses has grown exponentially in Europe and across the rest of the world, exceeding the reach of many national educational systems. Policymakers, educators and trainers envision microcredentials to be an innovation with various uses and benefits – a kind of all-purpose solution for the problems confronting education, training and labour market systems – and some have begun to integrate them into existing practice and policy frameworks. But can microcredentials improve lifelong learning and employability for end users?

While the term ‘microcredential’ may be novel, the activities it encompasses can refer to long-standing practices. As its name implies, it often focuses on modules of learning much smaller than those covered in traditional academic awards, giving learners the opportunity to complete their learning/training pathway over a short time. However, microcredentials do not replace traditional qualifications, as confirmed by Cedefop’s study on the topic. Instead, they can complement traditional qualifications and serve as a lifelong learning opportunity to all. If used according to high quality standards, their highly varied function, scope, duration and delivery can allow microcredentials to meet new skill needs in a targeted and flexible way, complementing existing qualifications. In cases where microcredentials are issued in a digital form, they could be added to credential repositories, or even included in national qualifications frameworks (although empirical evidence is still lacking on this).

This paper offers a helicopter view of the nature of microcredentials based on a literature review and a development of four plausible scenarios, attempting to capture the state of play of this diverse but dynamic ecosystem currently being shaped. The key question to ask is in which cases (scenarios) do microcredentials belong? A scenario approach may serve as a basis for probing whether the range of functions of microcredentials identified or their intensity will be changing in the future. They are intended to show abstract representations of types of microcredentials and could be used to enable critical discussions and a dialogue about their future. They could also be used as a reference point for further analysis or even referred to as consequences of certain actions that policy-makers take today. The paper also argues for the need to focus more on the profile of short forms of learning and certification by a careful unpacking of knowledge, skills and competences, as reflected in the examples identified.

Research shows that microcredentials are popular not only among university-educated people already in employment (as a means to excel and achieve a higher professional status) but also with low skilled unemployed individuals in their efforts to upskill and reskill in the labour market. However, the proliferation of credentials offered in the labour market (including but not limited to credit-bearing certificates, licences, apprenticeships, badges, nano/micro-degrees, vendor certifications and industry or professional certifications), and the related information about their added value, varies substantially, and this contributes to fragmentation. For this reason, this paper explores the emergence of microcredentials and their links with

(the character and quality of) vocational and professional education, training and learning. This is the area where learning, or the acquisition of qualifications/skills, has a direct connection with the labour market, reflecting the need to recognise and 'credential' even minor achievements and shorter forms of learning.

Findings suggest that it is essential to understand how the microcredentials phenomenon influences vocational and professional learning, as the future qualifications systems might look very different from today, evolving into qualifications/credentials frameworks or even digital platforms of credentials. It is even more important to use the 'learning outcomes' lens, as this approach helps to link supply and demand and is commonly used for describing vocational qualifications; the way it is applied and interpreted in Europe varies.



# Introduction

Traditional models of teaching and learning are being challenged by changing educational landscapes, the pervasive influence of technology and fluctuating labour market demands. The 21st century learner is now able to explore various ways of accessing learning and is given the opportunity to gain knowledge in different ways, but is also asked to acquire more than theoretical knowledge to become 'work-ready' and thrive in an ever-changing economy.

Short learning experiences and more flexible, learner-centred forms of training have begun to gain prominence during recent years although their existence has been prominent in VET and particularly in continuous vocational education and training (CVET) for a long time. In specific labour market sectors (like ICT), where multinational companies are very important in defining qualifications and credentials, the need for a quick update of knowledge, skills and competences has been intensified. In this context, credentials or forms of provision other than full qualifications offered by formal education and training establishments or even private actors, have become a popular option for employability, though their offer remains varied. The term 'credential' could refer to degrees, diplomas, qualifications, licenses, certificates, badges, microcredentials, and professional/industry certifications as well as documentation of learning achievements in courses, internships, apprenticeships, and various types of military training programmes. These credentials do not always include information about the skills and competences they represent. As a result, educators, employers, and even learners/workers themselves struggle to understand their meaning and added value.

Different types of credential issuers are growing faster than our ability to make sense of them. The credential landscape is diverse, with many actors working independently of each other; the diversity of the offer from a range of providers, such as higher education institutions, VET providers, companies, trade unions, industry bodies, private providers and NGOs, inevitably poses questions related to their transparency, quality, recognition, and portability between countries and sectors.

The above considerations highlight that in-depth understanding of the type of learning is crucial for understanding how the microcredentials phenomenon influences vocational and professional learning. Despite growing interest in microcredentials, the lack of standardisation, the variety of quality assurance approaches, and lack of transparent recognition processes create an additional need for a fine-grained analysis of which credentials are sought by employers and held by potential jobseekers. Considering that individual needs are very different, as also seen through LinkedIn profiles and self-reported credentials and career mobility outcomes, microcredentials can serve as 'door openers', addressing new and emerging skills or even serving as a stimulus to continue and/or go back to formal education. But they can also be used as a tool 'for excellence' for particular target groups.

In December 2021, the Council of the European Union (EU) adopted a proposal for a [Council Recommendation on a European Approach to Micro-credentials for Lifelong Learning and Employability](#) in June 2022, reacting to the needs of a fast-changing society and labour

market and outlining a common approach for higher education and vocational education and training institutions (Council of the European Union, 2022). The recommendation lists measures that EU Member States could consider implementing to support the development of a microcredential ecosystem. Despite the political context surrounding microcredentials, critical research has been limited in two crucial ways:

First, it has largely centred on the higher education sector; the hype about microcredentials is very similar to the discussions and activities surrounding higher education, particularly the institutions, businesses and other institutions who are actively offering alternative credentials that help learners acquire new skills, update their existing skills, and signal the competences they already have (Kato et al., 2020, p. 33). No comprehensive data on the number and type of microcredentials currently exist. There is also a diverse range of course durations, spanning from just a few weeks to several years. Wheelahan and Moodie (2021), have examined this phenomenon in higher education, arguing that microcredentials build on the discourse of employability skills to the extent that they “discipline’ the HE curriculum and align it more closely with putative labour market requirements’. However, the relationship between education and learning is complex and often not fully understood, so a careful analysis of labour market demand and the required skills and competences must be made.

Second, in cases where the research focuses on vocational education and training (VET), it largely disregards critical analysis of the content and profile of qualifications and credentials. The recent proliferation of microcredentials has made it challenging to monitor and ensure the quality of the credential offerings; also, the distinction between microcredentials 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 microcredential: while qualifications are increasingly described in terms of learning outcomes, the same approach could be followed for microcredentials as information on their content needs to be clear and easily accessible to individuals to learners and workers. It is not apparent how assessments are conducted or how rigorous the programs are, relying on the credibility of the credential and the training provider. Learning outcomes differ in length, level of detail as well as orientation. This is where the current working paper seeks to intervene.

The following emerging questions arise:

- (a) to what extent are learning outcomes reflected in existing microcredentials?
- (b) to what extent, can context- and purpose-specific scenarios of microcredential provision be identified?
- (c) what types of microcredentials currently fit in the description of these scenarios?

This working paper aims to engage critically with an understudied area of short training and learning opportunities in vocational education, and discuss whether using learning outcomes can allow speedy understand of their content, complexity and orientation.

## CHAPTER 1.

# Methodology and approach to findings

To place microcredentials in their larger societal context, without disregarding the individual learner perspective, a parallel strategy/approach is chosen for this paper. It includes an analysis of specific cases, including a close reading of learning outcomes where appropriate. This is realised as follows;

- (a) the paper presents the context in which the microcredential in question developed;
- (b) it focuses on the learning outcomes/assessment (where possible) specifications to gather data on the type of skills and competences and knowledge classifications under instruction;
- (c) it analyses the social implications for the individual learner;
- (d) it places, from the information gathered, the case into one of four scenarios developed to concretise microcredential use cases, based on Cedefop's (2010) study on Changing qualifications in Europe, which provides an important reference point notably by outlining a set of scenarios for the development of qualifications systems in Europe.

Close examination of the type of knowledge, skills and competences acquired allows a first attempt to illustrate possibilities and analysis of the microcredentials offer. The benefits of this approach are twofold. First, an explorative part in this new and varied landscape is presented; and second, plausible scenarios upon which the analysis is made are developed. Case-sampling was purposive and by no means representative of the whole range of microcredentials offered in public and private spheres. The aim is to gain first valuable insights into this diverse landscape. 'Information-rich' cases have been selected, bringing examples of microcredentials in European countries and beyond, from different sectors and educational settings.

## CHAPTER 2.

# Literature review

The emergence of the COVID-19 crisis gave rise to constantly expanding literature on the impact of new digital technologies on jobs and skills and the new requirements of the labour market. Most academic and policy attention has also focused on the need to support medium- and lower-skilled workers with appropriate reskilling policies <sup>(1)</sup>, to secure their rapid reintegration back into the labour market and/or foster job mobility (World Economic Forum, 2019). So how do microcredentials play a role in such policies?

Bite size courses came to prominence during and after the pandemic as the needs of industry had to accommodate a changing economic and technological context. Many employees had to retrain quickly to retain their current employment status. There has also been plenty of debate about the extent to which traditional education can adequately prepare learners for the needs of the labour market, considering the rising cost of degrees and the plethora and diversity of alternative ways of learning (including digital badges, nano credentials, and minor awards). Microcredentials have appeared as a new way for individuals to build their own skills-profile (portfolio) by collecting and ‘stacking’ learning in a flexible way, at their own pace and according to their own priorities. Empirical data suggest that these credentials are used as complementary to a full qualification demonstrating employability skills; for unemployed adults, or those with no formal qualifications, they become a replacement for a full qualification. However, the definition and regulatory context of microcredentials varies across countries.

According to Cedefop (2022a) there is considerable uncertainty linked to the naming and function of microcredentials, as in most European countries there is no official definition, even when there is a longstanding practice to offer shorter learning experiences. Developments in microcredentials, and their incorporation into national qualification systems, vary substantially between European countries (Cedefop, 2023a). Cedefop’s analysis of the [European Inventory of NQFs](#) has reaffirmed the findings of Cedefop (2023) that, although the term is seldom used as such, the phenomenon is real (Cedefop, 2024) <sup>(2)</sup>.

As noted by Mateo-Berganza Díaz et al. (2022), microcredentials 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);

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(1) The [2020 EU skills agenda](#) focuses on [targeted policies that can facilitate the upskilling and reskilling](#) of EU citizens.

(2) 13 countries have reported that at least a type of microcredential is part of their framework. Most have indicated that some levelled qualifications can be considered as microcredentials. 6 countries are currently exploring the possibility of including microcredentials in their frameworks (Cedefop, 2024).

- (f) social capital value (high networking versus low network);
- (g) connectivity, i.e. the stackability of microcredentials. Are credentials linked to other learning experiences or each other? Is a credential a building block that can be used to acquire new credentials?.

This new ecosystem, and the increasing and diversifying uses of microcredentials, raise various questions at a European level related to their form of assessment, recognition and certification; it is also asked whether they can be treated as stackable building blocks of full, recognised credentials or qualifications. These features are currently being debated as they determine the added value learners and employers will ascribe to them.

The biggest advantage of microcredentials, according to Grainger (2023) is their employment focus, as they are often designed by industry. Companies and organisations, in their effort to address the challenge of a competitive labour market and the consistent need to stay relevant, take on a bigger role in reviewing the training they offer, the modes of delivery in place, and the methods of assessment they use (Yang et al., 2019), ensuring that the qualifications of their employees are pertinent to their institution's work. They attempt to repurpose and restructure their offer by considering the teaching for performance on-the-job and encouraging the blending of delivery modes (simulations, work-based distance learning) to facilitate learning for a variety of purposes (diplomas, proficiency certificates, microcredentials, degrees) (Yang et al., 2019).

Designing a microcredential requires careful and precise articulation of learning outcomes. While formal vocational qualifications are increasingly described in terms of learning outcomes, it is important that information on microcredential content is also clear and easily accessible to individuals. Efforts have been made at a European level to address the challenge of varying learning outcomes presentation, hindering the comparability of qualifications and limiting the use of digital technologies. Building upon past and present developments concerning formats and methods for presenting and sharing information on qualifications, common principles have been established for developing short descriptions of learning outcomes for the publications on qualifications databases and registers <sup>(3)</sup>. These principles need to be considered, when reflecting on the content of existing or emerging microcredentials.

Another issue is related to digital developments in this area and the emergence of digital credentials, as this format can potentially improve the way in which information is made available and compared. Digital credentials are statements issued by an organisation to a learner, documenting their learning <sup>(4)</sup>. They can be issued through the [Europass digital credentials for learning infrastructure \(EDC\)](#) which aims to link qualifications and credentials

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<sup>(3)</sup> The European Qualifications Framework Advisory Group and the Europass Advisory Group mandated a group of experts (2021-23) to develop guidelines on short descriptions of learning outcomes for publication on Europass. The European Guidelines for the development and writing of short, learning outcomes-based descriptions of qualifications were endorsed by both groups in November 2023 and will be published on Cedefop and Europass webportals.

<sup>(4)</sup> [European Digital Credentials](#) for learning include diplomas, transcripts of records and a wide variety of other types of certificates of learning achievement. They are multilingual and signed with a unique electronic seal (the digital equivalent of an institution's rubber stamp). This allows education and training institutions to easily authenticate, validate and recognise credentials of any size, shape or form.

with information from an individual. The credentials refer different types of documents, like a certificate of attendance, a recommendation by an employer, or a volunteering experience, to qualifications or microcredentials <sup>(5)</sup>. In a digital context, attention should be given to the way information is presented. Individuals are given many opportunities to access and use information about their skills and competences in an interactive way (and link them to employment and learning opportunities) but detailed conceptual work might be needed; the way the description and presentation of information is made might have an impact on transparency of the content shared (i.e. with employers) and transferability of learning across different settings. The following sections aim to draw insights related to VET from an epistemological perspective and the importance of learning outcomes approaches.

## 2.1 Content and profile of VET: epistemological issues

Policy debates on the current and future role of vocational education and training often focus on changes related to future labour demand, work organisation and the impact on people's skills. However, this focus disregards the supply side; the structure and content of VET programmes, the responsiveness of VET systems to the new labour market demands, and their flexibility to provide quality training to a varied group of learners. Cedefop research (2017) examined vocational education's identity, which 'is rooted in distinctive knowledge production, use and transfer', its definition and conceptualisation, while Cedefop (2022c) attempted to explore changes in its epistemological basis at upper secondary level in Europe. These studies examined the discourse on skills and competence development, which is fundamental not only to VET but also to the current debate on microcredentials' provision, value and currency in the labour market.

The research also tried to shed light on the concept of 'knowledge' (from an epistemological perspective <sup>(6)</sup>) and the balance between occupation-specific skills, general subjects and transversal skills and the way this has evolved from the past. Ryle's dichotomy of 'knowing that' and 'knowing how' is considered in the paper. According to this distinction, the knowledge demonstrated by the ability to perform a given action (knowing how) is distinct from the propositional knowledge that consists of the awareness of facts (knowing that) and cannot be reduced to the latter (Cedefop, 2022c). Research findings further show that the practically oriented knowledge creation provided by VET provides various benefits for individual workers and employer organisations alike. It prepares for different types of jobs and career pathways within the hierarchy of occupations. Workers can gain an education that is more directly relevant to the changing needs of the workplace. Although national employment

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<sup>(5)</sup> Since 2019, 18 European countries have attempted to implement the European Digital Credentials for Learning (EDCL) which are designed by the European Commission as part of the Europass platform (Cedefop and ReferNet, 2023).

<sup>(6)</sup> An [analytical framework](#) was developed in the Cedefop study on [The Future of VET](#) describing differences in VET between countries and over time from three different, partly overlapping perspectives: an epistemological or pedagogical perspective; an education system perspective; and a socioeconomic or labour market perspective.

systems differ, vocational education and training contributes to ‘workers’ capabilities to promote improvement in the workplace’ (Streeck, 1991).

Wheelahan (2019) develops the argument that the information imparted in vocational education and training needs to include theoretical contents to give learners access to the criteria they need to identify and select the knowledge and skills that help them to respond to professional problems in a creative and innovative way. Her position draws on the work of Bernstein (1999, 2000, 2003), whose theoretical approach combines reflections on the content or substance of knowledge with an analysis of the social conditions of its constitution and application. Nevertheless, theories related to applied knowledge or situated learning need to be considered when reflecting on the content and profile of different types of qualifications and credentials and different work environments. Lave and Wenger (1991) introduced theories on situated learning (also referred to as situated cognition) to describe how individuals acquire professional skills. They argue that knowledge, skills and competences cannot be treated as isolated or decontextualised entities and/or subjects but need to be addressed in context (i.e. where they are situated).

Another interesting distinction related to national work systems is the so-called ‘organisational space or occupational space’ (Cedefop, 2017). In an organisational space, companies organise the working environment in a way that suits their best interest, without necessarily considering the qualifications and skills of employees, as most learning takes place on the job. Workers mainly deal with routine tasks and are not able to progress and join the rank of a higher position, i.e. a manager. In contrast, in an occupational space, companies create a working environment or process where workers are requested to perform multiple tasks and roles. They form part of self-organising teams, learn from other experienced workers or even change between various companies. This dichotomy is summarised in Table 1.

Table 1. **Summary of key dimensions of occupational versus organisational space**

	<b>Dominance of organisational space</b>	<b>Dominance of occupational space</b>
Occupational structure/hierarchy	High number of low skilled, low number of vocationally skilled on medium level, high number of skilled employees with qualifications on post-secondary or tertiary level. Vocationally skilled workers are mainly: semi-skilled workers; technicians.	Low number of unskilled, high number of vocationally skilled workers on medium level, low number of employees with post-secondary or tertiary degrees. Vocationally skilled workers are mainly: skilled workers with a qualification on upper secondary level.
IVET prepares for	entry level jobs	membership in an occupation/ (para)profession

Source: Cedefop (2017)

The above distinction can guide the reflections on microcredentials from a labour market perspective. How can microcredentials support employability in such spaces? Can they certify a person has a well-defined and very specific skill set that it is transparent for the labour market stakeholders? Or can they fall short in the signalling function of credentials: to signal the possession of certain attributes that are difficult to observe (for example, at the time of

recruitment) but are viewed as relevant for an individual's productive capacity? What type of knowledge, theoretical (knowing that) or practical (knowing how) can be discerned in different types of existing microcredentials? These variants and the learning outcomes approach analysed below are important from an epistemological perspective.

## 2.2 Learning outcomes and assessment of microcredentials

### 2.2.1 Importance of outcome-oriented approaches

The description of and focus on learning outcomes is strongly emphasised in many EU policy documents. For example, in the European Qualifications Framework (EQF) context, learning outcomes help make qualifications linked to the EQF (via their inclusion in NQFs) transparent, more understandable, comparable and transferable (Council of the European Union, 2017). Learning outcomes are considered as facilitating the design, delivery and assessment of full qualifications or components of qualifications.

While progress has been made for qualifications awarded through the formal education and training system, the learning outcomes focus is less systematically applied in non-formal settings or other certificates that still rely heavily on input factors (Cedefop, 2022b). Instead of focusing on the inputs to learning - when, where and how it took place - the learning outcome approach draws attention to what an individual knows, can do and understand following a sequence of learning. This shows that a qualification or a credential can be achieved in different ways, not only through formal education and training but also through learning at work, or other non-formal <sup>(7)</sup> or informal <sup>(8)</sup> settings. Although learning outcomes alone might not be enough to understand fully and compare qualifications and credentials, or capture the qualities of a learning process, they provide essential insights into their content and scope; for example, learning outcome statements can describe competences in a manner relevant for the workplace.

The emphasis on learning outcomes is also evident in the [2022 Recommendation on micro-credentials](#) which describes them as 'the record of the learning outcomes that a learner has acquired following a small volume of learning. These learning outcomes will have been assessed against transparent and clearly defined criteria. Learning experiences leading to microcredentials are designed to provide the learner with specific knowledge, skills and competences that respond to societal, personal, cultural or labour market needs.' The recommendation calls Member States to consider the European standard elements to

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(7) 'Non-formal learning' means learning which takes place outside formal education and training through planned activities in terms of learning objectives and learning time and where some form of learning support is present. Source: [Council Recommendation of 16 June 2022 on a European approach to micro-credentials for lifelong learning and employability](#).

(8) 'Informal learning' means learning resulting from daily activities and experiences which is not organised or structured in terms of objectives, time or learning support; it may be unintentional from the learner's perspective. It does not automatically lead to a microcredential but can be considered in the context of validation arrangements which may identify, document, assess and/or certify an individual's learning outcomes. Source: [Council Recommendation of 16 June 2022 on a European approach to micro-credentials for lifelong learning and employability](#).



describe a microcredential including mandatory elements<sup>(9)</sup>, one of which is learning outcomes. It also calls on them to ‘adapt procedures for the recognition of prior learning and the validation of non-formal and informal learning to allow for the awarding of microcredentials’, so including validation among the principles for the design and issue of microcredentials.

This discourse and the emergence of arrangements for validating non-formal and informal learning are broadly related to the creation of more flexible systems by opening to a wider range of experiences, not only in formal education institutions but also at work and at home. The flexible nature of learning outcomes allows to meet the needs of learners with special educational needs as well as open up education and training systems to non-traditional learner groups (e.g. older learners), break through gender patterns in VET enrolment, and respond to diverse needs of learners (NCCA, 2019). This can also be linked with the modularisation (Cedefop, 2010; 2015) of programmes (allowing for validation of non-formal and informal learning and recognition of prior learning), learner-centred and differentiated teaching approaches, individualised learning plans, and flexible pacing.

However, the way learning outcomes are defined and written significantly influences their quality and relevance, as underlined in Cedefop’s (2017) European learning outcomes handbook. Recent studies (Cedefop, 2022) also reveal that learning outcomes descriptions can vary, for example in term of length, formulation, granularity, and this poses a challenge to comparability of qualifications. The forthcoming European Guidelines for the development and writing of short, learning outcomes-based descriptions of qualifications can support such a process and facilitate transparency and comparability of qualifications and credentials from different sectors and countries.

The consolidation of microcredentials into larger credentials or full qualifications is related to learning outcomes being understood in a transparent way, but also being placed into the context of the particular credential.

### **2.2.2 Assessment of microcredentials**

The writing and articulation of learning outcomes must be followed by implementation through assessment; it is only when interacting with practice that their full potential can be released (Cedefop, 2017). Assessment refers to the process or method used to evaluate, measure and eventually describe the learning outcomes acquired by individuals through formal, non-formal or informal settings. Assessment is performed by the provider or other recognised assessment providers. This requires a decoupling of microcredentials from programmes and courses and concentration on outcomes achieved regardless of place or mode of learning.

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<sup>(9)</sup> The standard elements are: identification of the learner, title of the microcredential, country(ies)/region(s) of the issuer, awarding body(ies), date of issuing, learning outcomes, notional workload needed to achieve the learning outcomes (in European Credit Transfer and Accumulation System, ECTS, wherever possible), level (and cycle, if applicable) of the learning experience leading to the micro-credential (European Qualifications Framework, qualifications frameworks in the European higher education area), if applicable, type of assessment, form of participation in the learning activity and type of quality assurance used to underpin the microcredential. Source: [Council Recommendation of 16 June 2022 on a European approach to micro-credentials for lifelong learning and employability](#).

Nevertheless, the quality of alternative credentials (including digital badges, microcredentials, nano credentials, minor awards) cannot be assessed due to the lack of transparency in the variation and range of offers delivered and branded as alternative credentials (Gallagher, 2018). As a result, the added value of microcredentials especially among employers (as evidenced by the Cedefop (2023) study on microcredentials) is negatively impacted. If microcredentials are to state the demonstration of a competence it would be necessary to adopt a view on how that competence was evaluated, the level of its performance, and how it may be expressed as a proportion of the competence demonstrated, for example, by someone who has completed an apprenticeship. It thus becomes evident that there is a need to consider the characteristics of microcredentials to understand better what is hidden behind their uptake and to consider them a trusted skills currency. Especially important, considering that at present there is no concrete and targeted information on recognition procedures, is a national framework for microcredentials or any research on the impact they have on employers and employees.

In *Making Microcredentials Work*, Oliver (2019, p.30) similarly suggest that personal development skills such as emotional intelligence could include verified psychometric testing. The quality of assessment is often defined by the key technical characteristic of validity as well as reliability, equity/impartiality/fairness, and transparency (see Stenström et al., 2006). Validity ensures that assessment approaches measure as precisely as possible the intended learning outcomes and that evidence fully supports the assessment (see e.g. Gillis & Batemann, 1999, pp. 9, 12-13). The American Institute for Research (AIR) (2020), in its brief on teachers and microcredentials, suggests rigorous evaluation and assessment based on 'teachers examining and responding to their own performance data' (pedagogy-based), 'mastery and demonstration of specific content and practice' (learning outcomes intended and achieved), and a 'valid and rigorous review process' (quality assurance based on psychometric criteria) as one of the four pillars of effective professional learning via microcredentials (AIR, 2020, p. 12). Yet the AIR acknowledges the lack of 'rigorous research', as is often the case in emerging fields; an examination of the assessment methods and criteria in microcredentials can thus be called normative, not prescriptive, leading to what could be called 'good practice' recommendations more than conclusive data (AIR, 2020, p. 11). Reflecting on the 2022 Recommendation definition of microcredentials, assessment and the reference to 'learning outcomes being assessed against transparent and clearly defined standards' the need to analyse the 'specific knowledge, skills, competences that respond to societal, personal, cultural or labour market needs' becomes imperative. For instance, action verbs used in learning outcomes statements play an important role in clarifying the object of learning and the context (occupational or social) where learning takes place (Cedefop, 2017, p. 48) as well as the breadth of competences acquired (technical skills, transversal skills); observing these (see Section 3.2.) can provide interesting insights into the profile of identified microcredentials.

In addition to quality, equity can play an important role in the assessment (and teaching) of learners as well as the assessment of microcredentials themselves. In test construction, it includes the notion that all people should have the same opportunity (equality of opportunities) to demonstrate their abilities; thus, equality (everybody receives the same) differs from equity

(which recognizes the different needs of individuals, and thus might allocate resources/construct tests accordingly). This could apply to test takers who do not share the same cultural background as the assumed majority, those with visual impairments or persons with other disabilities, whose first language is not the one of instruction and assessment, the test-taking setting, which might influence factors such as concentration and time management, and access, financial or other, to testing in the first place. With an often-heterogeneous audience, the balance between reach and specificity is one providers have to face.

While some of these criteria are not to be analysed within the scope of this paper, since they relate to education in the digital sphere overall as opposed to microcredentials specifically, chapter three tries partially to address notions of equity and impartiality where appropriate. Examining the assessment methods and criteria of courses leading to microcredentials could shed light on how the achievement of the required learning outcomes at the appropriate level is measured. Whatever the results, for microcredentials to become a trusted skills currency, assessing knowledge acquired in short learning courses needs to be quality-assured and based on scientifically sound criteria, with common ground across providers and countries in order to be recognisable and stackable.

## CHAPTER 3.

# Focus on microcredential examples

In this section, specific examples of microcredentials are presented to understand the individual investing in skills development and the employers looking for immediate qualifications for the specific skills that they are seeking. This can be achieved by analysing the description of skills and competences of credential holders. Microcredentials are outcomes-based, so they usually specify what type of knowledge, skills and competences the learner has mastered in the learning/training process. They signal what the individual has achieved and can be more useful for employers compared to traditional qualifications/certifications without this type of information. Traditional qualifications indicate a significant level of learning, but they do not always signal the exact skills gained through that education. Based on shorter bursts of learning, and usually designed around specific skills, microcredentials send a clearer signal about what the learner can do.

Where learning outcomes descriptions are discerned in microcredential certifications, they refer to the work tasks of professionals; they capture the tasks that a person should be capable of performing, which allows sight of the structure and format used to present and (possibly) group them (do they refer to knowledge, skills, competences or to work tasks), and which level of detail (granularity) is used to describe them. Before analysing concrete examples of microcredentials, the development of scenarios - intended to capture a very diverse reality of microcredentials - is discussed.

### 3.1 Scenarios of microcredential offer and use

Cedefop's 2010 study on Changing qualifications in Europe, and the presentation of a set of scenarios for the development of qualifications systems in Europe towards 2020, has inspired the development of scenarios in this paper as the messages conveyed remain still valid.

The study questions the extent to which key tensions characterising the evolution of European qualifications and credentials systems within these scenarios are relevant. It first underlines the key tension between flexibility and stability; this is key to the understanding of modern qualifications and credential systems. A focus on stable and dependable qualifications places the emphasis on developing and maintaining a coherent, stable, transparent and predictable system of trusted qualifications that can stand the test of time. Emphasising 'flexibility', in contrast, implies that a wide range of learners should have easy access to qualifications and credentials and that these should be associated with a diversity of learning forms and contexts. Second, the study refers to the tensions between supply and demand, which illustrates the conflicting requirements to be balanced by qualifications and credential systems. When the supply side dominates, as is the case in traditional national qualifications systems, the main objectives are to uphold and protect standards; to ensure transparency and predictability and thus to reach as wide a group of potential learners as possible, including those at risk. A demand-led system reflects more directly shorter-term interests of diverse

stakeholders, and can thus change more rapidly. Policy aspirations in different countries and reform objectives show that flexibility and responsiveness to the labour market is of key concern. This does not mean that a country should move towards a specific direction conditioned by the demand side without critical thinking of national specificities and circumstances. Scenarios can be developed illustrating the implications of different choices; they will never materialise in the ideal form but can become dominant and influence developments at national level. Scenarios can also help alert policy-makers to different trends and their implications.

In this context, the Cedefop (2010) study sets out four contrasting scenarios for qualifications development which can be seen in the figure below:

Figure 1. **Four scenarios for the development of qualifications, Europe 2010**

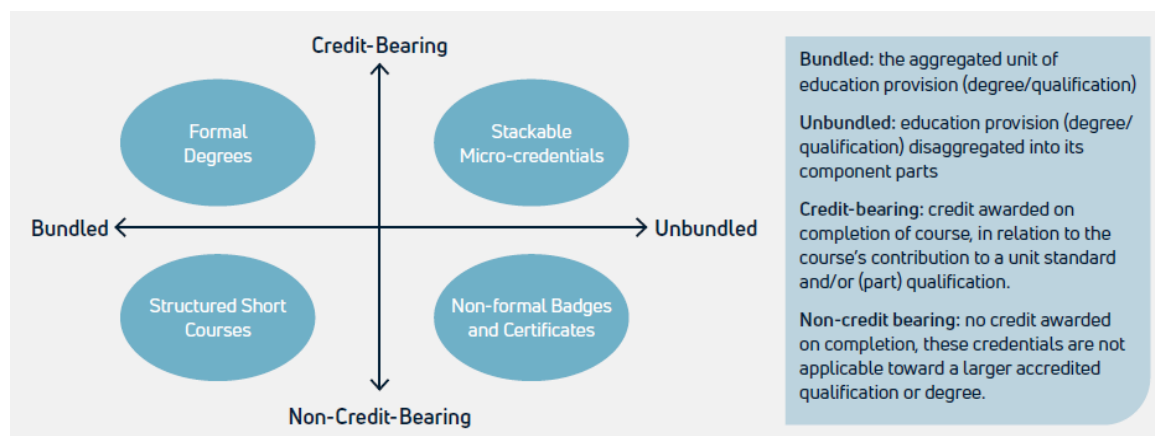
<p><b>SCENARIO 1:</b> <b>Flexible qualifications, supply-driven</b></p> <p>Learners can navigate qualifications flexibly, which leaves space for learners to choose how they qualify. Education and training providers are in control, emphasising traditional goals and values, efficiency, cost-effectiveness and making sure that large numbers can qualify.</p>	<p><b>SCENARIO 2:</b> <b>Flexible qualifications, demand-led</b></p> <p>Learners can navigate qualifications flexibly, which leaves space for learners to choose how they qualify. Governance systems ensure that the social partners and community interests are strong partners in qualifications development, emphasising labour market signals, as well national and community values.</p>
<p><b>SCENARIO 3:</b> <b>Solid, dependable qualifications, supply-driven</b></p> <p>Learners face large, benchmark national qualifications and systems that govern access, participation and progression. This limits flexibility. Education and training providers are in control, emphasising traditional goals and values, efficiency, cost-effectiveness and making sure that large numbers can qualify.</p>	<p><b>SCENARIO 4:</b> <b>Solid, dependable qualifications, demand-led</b></p> <p>Learners face large, benchmark national qualifications and systems that govern access, participation and progression. This limits flexibility. Social partners and important groups in civil society have a lot of influence over how qualifications are structured, mainly at the national level.</p>

Source: Cedefop, 2010.

The emergence of microcredentials has had a substantial impact on scenario 2; it can be assumed that they mainly focus on the benefits of demand-driven, flexible systems giving employers and learners a high degree of choice. However, most growth has taken place outside national education systems. A key challenge therefore is to be able to capture all the dynamics behind microcredentials and see how they flourish in the labour market and how they interact with national systems, particularly when different European (and international) countries have adopted different approaches to qualifications frameworks, credit and validation systems.

Brown, Mac Lochlainn, Nic Giolla Mhichíl and Beirne (2020, as cited in Beirne et al., 2020) further outline a credential ecology which differentiates between credit-bearing and non-credit-bearing credentials, and credentials that are bundled and unbundled.

Figure 2. **Credential ecology**

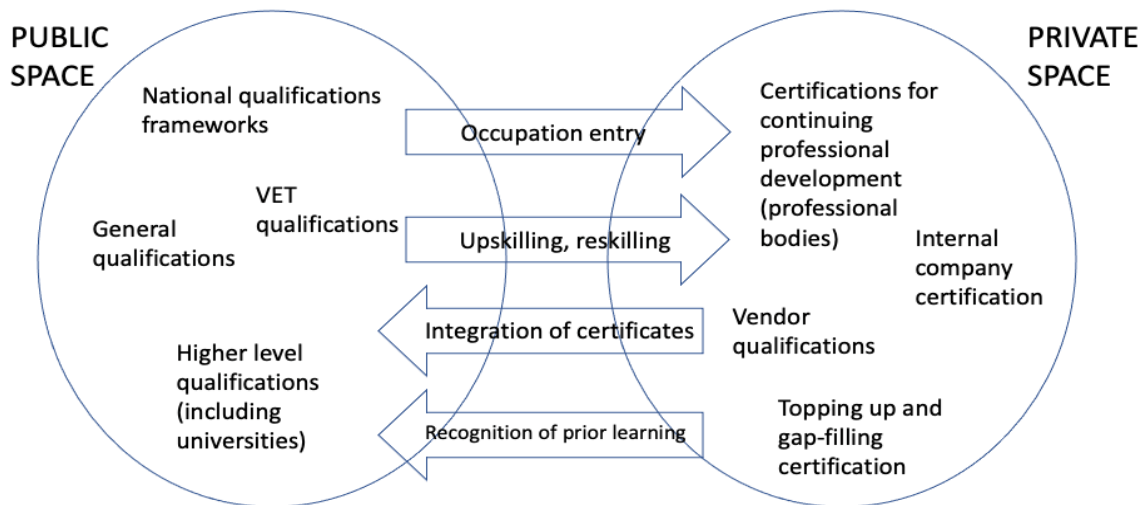


Source: Brown, Mac Lochlainn, Nic Giolla Mhichíl, & Beirne (2020), as cited in *Micro-Credentials: An Evolving Ecosystem Insights* (2020, p. 6).

This credential ecology allows microcredentials to be situated in relation to other types of credentials; traditional degrees, digital badges or shorter courses as unbundled, credit-bearing credentials. Although it still leaves many discussions open, such as whether units of formal degrees (having a separate certification) could be considered microcredentials, the differentiation supports the reflections made in this chapter.

It becomes evident that the ecosystem of microcredentials contains various tensions. Another one is between the public and the private sphere. Next to qualifications or credentials offered through a formal system, there are various types of qualifications and certificates offered outside and independent of the formal system. They might be called, for example, non-formal or 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. It is important to understand how microcredentials in private and public spaces interact, as shown in the figure below:

Figure 3. **Microcredentials in public and private space**



Source: Cedefop, 2022b.

According to Cedefop (2022b), there are several shades of interaction in the public space between microcredentials and qualification systems. They may be part of the qualification system, such as in the modularisation of qualification frameworks. They may also be separate, where the value depends on the status and credibility of the body standing behind them. They may also be publicly funded, in parallel with credentials qualifications in the qualification system. In the private space, certificates and credentials vary in terms of their value to the labour market. The abundance of such credentials is due to the proliferation of their unregulated nature, which creates oversupply and as a result their devaluation. State intervention can be observed in the private space, with public funding for privately offered credentials or certifications.

This dichotomy may seem simplistic unless we consider the space in between the two spheres or what could be hidden or not made explicit, especially when considering non-formal learning and informal learning, which allows individuals to transfer and accumulate learning across sectors, institutions and countries. The combination of diverse certificates and credentials (i.e. vendor or task certificates) into a large totality not only plays a key role for labour market or lifelong learning purposes (Cedefop, 2023c) but also for the development of any scenario related to the content (and not the length or size) of credentials.

### 3.2 Possible scenarios for microcredentials in VET

National contexts vary greatly from country to country in Europe, and from one sector of education and training to another. It is meaningful to observe changes in a qualification or credential system in the setting of the system that produces it. These changes belong to a greater system of change related to changing priorities, policies, reforms or even culture and mindsets at a national level. Cedefop's extensive research on the [Future of VET](#) has paid attention to the way the content and profile of vocational education and training are changing,

as a response to changing labour markets, demands for skills and competences at work and in society at large. In the attempt to capture observable trends in vocation education and training, scenarios archetypes of future expectations were developed (see Cedefop, 2023d). According to national and European stakeholders, their key value was their ability to challenge ways of thinking, by moving away from institutional and national dividing lines and offering the opportunity to see alternative pathways.

Based on the above, possible or even plausible scenarios with specific types/characteristics of microcredentials are presented below. Characteristic examples are identified in the scenario where they could belong (see Section 3.3). These scenarios could serve as a consistent, if limited, illustration of microcredentials as they currently exist (even if there will be limited examples) or could possibly develop over the longer term. They are intended to show abstract representations of types of microcredentials and could be used to enable critical discussions about their future. They could also be used as a reference point for further analysis or even referred to as consequences of certain actions that policy-makers or providers of microcredentials take today.

These complex relationships could be reflected in different types of scenarios as presented in Table 2 below:

Table 2. **Presentation of four scenarios for microcredentials**

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

Source: Author.

### **Scenario 1: Supply-driven microcredentials (as part of formal education) for further learning (examples of credentials supplementary to traditional or partial qualifications)**

In this scenario, microcredentials operate as integrated parts of formal qualifications and credentials systems. They can be supplementary/add-on to traditional qualifications or partial qualifications; they represent short units of learning and result in certification following a process of assessment. The emergence of microcredentials is complementing traditional qualifications as countries operate with modularised VET systems that have a high number of smaller units of learning which can be combined and accumulated by individuals in a flexible way. This means that microcredentials have the potential to be used as building blocks to be combined with qualifications and credentials from other institutions and sectors (concept of accumulation/stackability).

### **Scenario 2: Supply-driven microcredentials for labour market entry (professional credentials)**

In this scenario, the focus is on vocational and labour-market-oriented learning, adding to existing initial and continuing VET provision; education and training institutions and organisations, (i.e. VET providers or universities of applied sciences) are delivering training for labour market purposes and are issuing microcredentials that are transparent. Created or



accredited by education institutions, microcredentials are considered as professional credentials specially designed for learners to build in-demand career skills. Learners attempt to enrich their knowledge of a subject, with the aim to earn an academic or professional credential without a financial commitment to a complete certificate or full degree. Task-based certificates and competence-based ones identified in this scenario are often awarded acknowledging (as well as visualising and signalling) a person's ability: that a person has specific knowledge, skills and competences in an occupation, industry, or technology. Holders of such credentials might have a better opportunity when continuing their education pathways or looking for a job, as hiring employers might use these credentials as a deciding factor for selecting candidates that provide evidence of specific competences in their fields (by means of a certificate).

### **Scenario 3: Demand-driven microcredentials (examples from enterprises/sectors)**

In this scenario, microcredentials evolve outside and independent of formal education and training systems, offered by companies, professional organisations and others. Certain large corporations or employers with a track record (such as Google, Microsoft, IBM, JP Morgan) offer microcredentials covering a variety of skills, not just occupational-type skills but also transversal skills. Employers could use such microcredentials to address skills mismatches and skills shortages within companies, as a response to technological, digital, social, environmental changes and development. In given economic sectors and regions (including ICT and retail), the aim is to equip the workforce with special skills that are needed. The purpose of microcredential use in this scenario could even be to meet regulatory requirements for upskilling in specific types of work (e.g. for licences, mandatory training and permits). This scenario refers to a demand-led system which reflects more directly shorter-term interests of diverse stakeholders and can thus change more rapidly.

### **Scenario 4: Microcredentials for vulnerable groups/groups at risk (upskilling/reskilling)**

In this scenario, microcredentials are understood as elements in a broader system of qualifications and credentials at all levels and in all institutional settings for a targeted group of learners; their potential in up- and reskilling policies and practices is recognised. The use of microcredentials is part of a lifelong learning approach which is the key to ensuring that everyone has the skills they need to thrive in society, the labour market and their personal lives. Measures are taken to recognise practical skills and competences acquired outside formal education that can help young or adult learners, professionals, and job seekers alike: to move closer to employment, to take up further education and to develop professionally. As a result, a wide variety of learners try to up-skill throughout their lives and re-enter the labour market: these include disadvantaged and vulnerable groups (such as people with disabilities, the elderly, the low-qualified/skilled, minorities, people with a migrant background, refugees and people with fewer opportunities because of their geographic location and/or their socio-economically disadvantaged situation) or even the self-employed or those working through platforms.

It is important to underline that many more combinations are conceivable within the four different settings described above. Instead of regarding them as a particular development they

could also be envisioned as particular ecosystems on the basis of which more concrete and contextualised scenarios can be developed.

### 3.3 Empirical results

This section presents empirical results related to the four scenarios illustrated above. The examples selected are based on specific criteria, presented in Box 1.

#### Box 1. Criteria for selecting examples of microcredentials

1. Evidence of learning outcomes approach.
2. Grammatical structure and format presenting learning outcomes (e.g., do the examples refer to knowledge, skills, competences or to work tasks), and what level of detail (granularity) is used to describe them?
3. Purposes of credentials acquired/issued.
4. Links with scenarios identified.

Source: Author.

In extracting examples, the first observation was that many come from the field of higher education and mainly in the Anglo-Saxon world, in countries such as Australia, New Zealand and the US. In vocational education and training the situation is more disparate, as are the vocational systems themselves, but the Cedefop study (2023a) has shed light on an increasing use of microcredentials in labour-market-relevant education and training, examining their characteristics, delivery and added value for end users.

Another observation was that regulations on microcredentials differ from country to country; while some have little to no oversight, some countries, have created comprehensive registers detailing the level and detail of competences, length of study, and the gap the microcredential tends to fill, evidencing its potential to add to the existing qualifications landscape instead of muddying it. New Zealand is such a country, as in the first example below.

#### **Microcredential system as part of lifelong learning in New Zealand (scenario 1 and 2)**

New Zealand has a long-standing commitment to lifelong learning. The New Zealand Qualifications and Credentials Framework (NZQCF) is its official framework as its name was updated when microcredentials were included in 2022. The New Zealand Qualifications Authority (NZQA) introduced the microcredential system as part of New Zealand's regulated education and training system as far back as 2010. Microcredentials can be offered through universities, polytechnics, industry training organisations, wananga, private training establishments, employers, and professional bodies (either directly or in partnerships with tertiary education providers). They are tools that recognise the achievement of skills and knowledge that are required in a particular industry. Microcredentials are small credentials which support continuous reskilling and upskilling and offer a cost-effective and efficient way to learn specific skills:

- (a) use of microcredentials outside the higher education system;
- (b) part of a flexible lifelong learning system;
- (c) integrated into a qualifications system and NQF;
- (d) modular and credits-based system, including stackable features;
- (e) demand-driven system that gives learners a high degree of choice;
- (f) evaluation exercise conducted in the pilot, providing some details of the further effects of inclusion of microcredentials in a qualifications system

The register includes around 400 microcredentials as can be seen in the orange box in Figure 4.

Figure 4. Register of NZQA-approved microcredentials

The screenshot shows the NZQA website's search interface for microcredentials. The header includes the NZQA logo, a search bar, and navigation links like 'Contact us' and 'Login Options'. Below the header, there are navigation tabs for 'HOME', 'QUALIFICATIONS & STANDARDS', 'NCEA', 'MĀORI & PASIFIKA', 'PROVIDERS & PARTNERS', 'INTERNATIONAL', and 'ABOUT US'. The main content area is titled 'Register of NZQA-approved Micro-credentials' and features a search form with fields for 'Keyword' and 'Developer name or Education Organisation number', and a 'Search' button. Below the search form, a yellow banner indicates '417 results found. Displaying page 1 of 3.' and includes a 'Next Page >>' button. The table below shows the following data:

Title	Level	Credits	Developer	Approval Date	Review Date
Core Construction of Forestry Roads (Micro-Credential)	3	40	Muka Tangata - People, Food and Fibre Workforce Development Council	01/2024	30/12/2026
ADAS (Trainee) Offshore ROV Pilot (Micro-credential)	5	20	Omne Marine Training Centre Limited	08/2022	02/08/2024
ADAS Diver Medical Technician (Offshore) (Micro-credential)	5	10	Omne Marine Training Centre Limited	07/2022	02/08/2024
ADAS Diver Medical Technician (Onshore) (Micro-credential)	5	10	Omne Marine Training Centre Limited	07/2022	30/10/2025

Source: NZQA (n.d.). Register of NZQA-approved Micro-credentials.

This case demonstrates the usefulness of a register breaking down the microcredentials on offer into level (3 to 5), number of credits (5 to 40), developer/provider, and the dates of approval and last review (with reviews taking place annually, confirming the microcredential is meeting its purpose and is quality-assured).

The initiative and platform are part of New Zealand's commitment to transparency and lifelong learning and have evolved within, and with the help of, public institutions, training

organisations, and authorities. Microcredentials provided through the NZQA are located at the intersection of scenario one and two. The wide range of microcredentials offered is perceived not only as staircasing learners to full qualifications but also helping address specific unmet skills needs. While the providers are both public and private, and the type of knowledge conveyed is mostly occupationally oriented, the NZQA is a public institution, publicly funded, and part of the larger national qualifications framework. This allows for easier integration of the microcredentials acquired into established education and labour market settings, countering fragmentation.

By accessing a few of the microcredentials included in the register, it becomes clear that 'they certify the achievement of a coherent set of skills and knowledge and are specified by a statement of purpose, learning outcomes, and strong evidence of need by industry, employers, and/or the community'. Observing the formulation of learning outcomes in the register, we see that rather complex verbs are used (i.e. 'make valid judgements', 'analyse', 'resolve') (see Annex) which are different level by level (complexity changes). The statements make reference to cognitive skills which, according to Bloom's taxonomy (Bloom et al., 1956) setting out a hierarchical categorisation of cognitive learning, are process-oriented and show the move from basic to more complex skills (analysis, synthesis of concepts, processes, procedures, and principles) (Cedefop, 2017, p. 34).

Examining the NZQA the guidelines for applying for approval of a training scheme or a microcredential, we see that microcredentials are subject to the same requirements as other training programmes and assessment standards and are required to:

- (a) be 5-40 credits in size;
- (b) demonstrate a need from employers, industry and/or community;
- (c) not duplicate any learning already approved by NZQA (such as that offered by tertiary education providers);
- (d) be reviewed annually to confirm that they are meeting their purpose;
- (e) be sure an industry training microcredential consists of one or more assessment standards listed in the Directory of assessment standards, which certifies the achievement of a specific set of skills and knowledge in workplace training.

### **Training for the labour market in Canada (scenario 2)**

Online microcredential courses are offered by colleges and universities in Canada. A learner's academic transcript usually shows the courses that he or she has enrolled in, the related credits, as well as the grades awarded; this depicts learner progress in detail. However, employers lacking institutional knowledge might consider that these transcripts do not indicate the learning outcomes achieved. It might thus prove valuable to look at some of the microcredential courses offered through Red River College Polytechnic partner organisations and associations that excel in continuing education and lifelong learning training.

RRC Polytechnic's microcredential online courses are manifold and offer benefits like quick course completion, demonstrating skills to employees, and flexibility in learning. According to the college, they allow employers to browse immediate qualifications for the specific skills that they are seeking. Employers can search the specific database on identified

standards and find potential employees that meet their requirements. For the Red River College Polytechnic, microcredentials are perceived as ‘the future of lifelong learning’.

Of note is that RRC Polytech evaluates and grants credits for qualifying previous learning that is equivalent to learning outcomes in college courses and programmes. Graduates are also asked to indicate their level of satisfaction regarding the education they received at Red River College Polytechnic. The example below shows a microcredential course that is non-credit and is delivered through the Learning Resources Network (LERN) via their UGotClass online course platform.

**Box 2. Course of Personal/professional development (Entrepreneurship)**

**Courses and descriptions**

**Personal/professional development**

This course provides insight into the characteristics, knowledge and skills needed to become a successful entrepreneur. At the end of this course, you will be able to identify the abilities required of successful entrepreneurs and how to acquire them, develop goals to help establish your business, develop an outline for your plan, and take home techniques to manage your new business successfully.

Upon successful completion of the course, you will:

- identify the knowledge, skills and abilities required of successful entrepreneurs and how to acquire them;
- develop goals to help establish your business;
- understand how to establish a legal business entity;
- develop an outline for your business plan;
- know how to use technology to make your business more professional;
- generate ideas on what types of business to consider, determine if starting a business is right for you.

Source: [RRC Polytech Catalogue \(n.d.\)](#)

This is an example of scenario 2, where the Red River College Polytechnic is delivering training for labour market purposes, so the focus is on vocationally and labour-market-oriented learning. From the description of the course, employers get an idea of the actual learning outcomes achieved; learners can display and articulate their competences between different employers and institutions. Learners undertaking this training are informed that the training will make a difference to their employability. The functionalities allowed within the course encourage self-motivated learning and seem to empower learners to investigate further learning opportunities.

Looking closely at the learning outcomes statements, they are written in a way that addresses the learner directly (‘you will be able to’). Action verbs that are used are a mixture of simple (‘understand’) and more complex verbs (i.e. ‘generate’) which according to the structure of observed learning outcomes (SOLO) taxonomy (Biggs & Collis, 1982; Biggs, 1999; 2014) show progressively complex levels of understanding. In this case the verb ‘generate’ refers to a generalisation of new ideas and would require more open-ended tasks, allowing for unintended outcomes (Hussey & Smith, 2008). Graduates of this course will be able to articulate their levels of understanding to future employers, being responsible for their own

learning and actions (Selwyn, 2013). The course focuses implicitly on broader core and personal skills and competences and less on technical and occupational tasks and functions, so learners are asked not only to reproduce knowledge but also apply the skills and competences acquired.

### Edubadges in the Netherlands (scenario 2)

In the Netherlands, experiences with microcredentials are mainly related to higher education. SURF is developing an infrastructure through which Dutch education institutions can issue digital certificates, called [edubadges](#). These enable organisations to award students or workers with evidence of knowledge and skills they have acquired. They are electronic certificates that provide detailed information on the content of the learning outcomes achieved; they are issued within a secure and trusted SURF platform. Students collect them in their edubadges backpack and can share them with employers or other education institutions. In this infrastructure, education institutes and schools have an open eye for badges that are linked to the learning outcomes of their curricula. These badges, with the corresponding documentation, can be part of an intake-assessment to realise an accelerated learning process after the assessment of these personal badges.

Edubadges were put in place to give students (and professionals) official recognition for those parts of the educational programme they completed. These smaller pieces motivate them to continue learning (without doing a whole programme) and can be considered an accelerator of lifelong learning.

This example is related to scenario 2, as education institutions can manage roles and privileges within the platform as well as create, edit and issue edubadges. It gives flexibility to the students as they can share their digital badges with employers or other education institutions. The SURF platform is linked to the new institution-wide identity, eduID, which allows external parties easily to verify the authenticity of the owner (Cedefop, 2022b).

Even though the initial experimentation with edubadges took place in the higher education sector and with programmes concerning ICT or technical business management, the funding was also allocated for testing edubadges in the vocational education and training sector. Table 3 provides a detailed overview.

Table 3. **Overview of edubadges per educational institutions**

Level	Total number of institutions	Total number of badges	Total open badges	Total edubadges
University	6	83	79	4
University of applied sciences	8	74	50	24
VET	4	167	164	3

Source: Wesselink, 2023.

Microcredentials are being piloted in four VET schools and offer 167 badges; of these 164 are open badges and only three are edubadges, in the field of medical mathematics (Cedefop, 2022b). Two training schools (Albeda and mbo Rijnland) issue edubadges to

students who did additional work on 21st century skills that were not part of the formal curriculum. This concerned skills such as collaboration and entrepreneurial behaviour.

Albeda students, after receiving their first edubadges, can upload them on their LinkedIn profile or CV to make their skills visible. Such an edubadge is official recognised proof of having completed part of an educational programme or the recognition of a certain quality or competence, such as collaboration. It aims to make learning and professional development more flexible for Dutch students.

### 3.3.1.1.1 Training in Nearly zero energy buildings in Ireland (scenarios 2 and 3)

Ireland has an emerging interest and developing landscape of microcredentials. The term is used in the country, though there is no consistent definition to incorporate the aspects established of what constitutes a microcredential. With the introduction of the Common awards system (CAS) in 2014, a uniform and structured credit system was developed across most, but not all, further education and training (FET) offerings up to Level 5 EQF-LLL, excluding higher education. There are four categories of awards included in the national framework of qualifications (NFQ) (McCoshan, 2023).

Table 4. **Categories of awards in NFQ**

Major	the principal class of awards at each level, capturing a typical range of learning achievements at the level;
Minor	for partial completion of the outcomes for a major award;
Supplemental	for learning that is additional to a major award;
Special purpose	for relatively narrow or purpose-specific achievements.

Source: Author.

Minor awards play an important role in the country for people returning to education, continuing professional development (CPD), work-based learning, and in recognition of prior learning. Minor awards do not normally lose their credit value and learners can, in theory, come back later and continue learning towards a major award. 'Minor qualifications' are especially important in work-related learning and for recognition of non-formal learning. They are, for example, developed for reskilling and upskilling purposes in labour market activation activities.

The 2021 QQI report on defining and exploring microcredentials across higher education refers to the value of microcredentials: 'Digital badges are an example of how microcredentials can be issued. Microcredentials are similar to minor, special purpose or supplemental award-types but can be significantly smaller in volume and, in contrast with minor awards, don't necessarily need to be part of a larger volume qualification though they can be aggregated and potentially used in RPL processes to gain exemptions from parts of, and advanced entry to, programmes leading to NFQ qualifications. They are especially useful to record the acquisition of specific skills needed by individuals e.g. for work' (QQI, 2021, p. 42).

Significant work has also been undertaken on microcredentials by Skillnet Ireland. In *A microcredential roadmap; currency, cohesion and consistency* (Nic Giolla Mhichíl et al., 2021)

Skillnet Ireland examines how microcredentials can contribute to upskilling and reskilling demands from both industry and employees. In this report microcredentials are defined as: smaller units of assessed learning recognised by higher education institutions and other trusted credential-bearing agencies or professional bodies. An emerging area, they offer many benefits such as short lead-in times to certification, flexibility in learning, and skill provision in new and expanding areas.

A concrete example is drawn from Cedefop (2022b) related to domestic and non-domestic buildings in Ireland which have been required to meet national Near zero energy buildings (NZEB) standards.

Construction professionals need to upskill and meet the requirements of the standard. In response, Waterford and Wexford Education and Training Board (one of Ireland’s FET providers) have developed a set of 10 short NZEB courses with inputs from industry partners, government departments, local authorities and third level (post-secondary) institutions, which provide learners with relevant knowledge of principles and practices and covering all the main building trades (ventilation, carpentry, plumbing).

The courses range in duration from 1 to 4 days; each trade-specific course is a mix of online delivery and a 1-day workshop. The learning outcomes of these courses are seen in the box below.

**Box 3. Training in Nearly zero energy buildings**

<p>On completion of this course you will / should be able to:</p>	<ul style="list-style-type: none"> <li>- List and describe the key policies and laws required to achieve nearly zero energy buildings NZEB.</li> <li>- Explain the key energy terms and measurement units associated with NZEB buildings.</li> <li>- List and describe the key construction principles, techniques and products to achieve NZEB compliance. These principles include continuous insulation, thermal bridging and air permeability, with special attention to windows and doors to achieve healthy buildings.</li> <li>- List and outline the key service techniques, methods and equipment needed to achieve NZEB compliance. These principles include energy performance of space heating, hot water installations and storage, ventilation systems and eco lighting with special attention to smart technology.</li> <li>- Identify best practice in a number of common construction methods and details relevant to NZEB compliance and be able to recognise work practices which fall below this standard.</li> <li>- Identify best practice for a number of renewable and service technologies relevant to NZEB compliance.</li> <li>- Understand why there is a need to talk and discuss with other trades in order to achieve NZEB compliance through collaborative teamwork.</li> <li>- Describe some key challenges of implementing high quality NZEB building projects and how to apply specific solutions to meet those challenges.</li> </ul>
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Source: Learner Handbook Nearly Zero Energy Building: Carpentry, p. 7.

An example of a sector-specific approach, this case illustrates how industries might react to global demands such as sustainability issues: green skills are thoroughly integrated into new courses, blurring the boundaries between traditionally academic skills and vocationally oriented ones. The aim of the course is specifically formulated in a way that centres the understanding of learners and their preparation and upskilling in an industry where regulations and associated standards are constantly undergoing changes. Learners need to acquire the capacity to integrate abstract knowledge: ‘this means that you may have to make some



changes in the ways in which you have worked in the past. An understanding of where these requests are coming from, will make it easier for you to make the changes being asked of you' (p.4). Learners must integrate the 'knowing that' into their everyday practices (the 'knowing how'). Other 21st century competences such as ICT technology and systems thinking are also part of the course curriculum. While, in theory, this gives learners access to abstract conceptual knowledge, the discourse is context-dependent, so that meaning-making does not transcend its particular, discipline-specific application and is segmented by the specific context in which it is realised (here, carpentry). This means that it cannot easily be applied in other settings.

This demand-driven industry specific example can most readily be located at the intersection of scenarios 2 and 3, as the emphasis is on vocationally oriented labour market learning but with close connections to the industry. The course aims to equip learners with the necessary knowledge, skills and competences in the principles and practices of NZEB for new build dwellings, as also observed in the action verbs used 'explain', 'list and identify', 'understand'.

#### **Targeting vulnerable groups with Atingi (scenario 4)**

[Atingi](#) is an initiative created by the Federal Industry for Economic cooperation and development in Germany; it is partnered with Smart Africa, an alliance of 32 African countries attempting to support sustainable socioeconomic development on the African continent via the use of information and digital technologies. Atingi provides access to learning content and lifelong learning opportunities throughout the African continent, where this remains a challenge; geographic remoteness and a lack of financial resources create serious problems for large parts of the population that cannot benefit from existing education offers. Girls and women, as well as populations living in rural areas, are considered marginalised groups and often lack the required skills and competences to be employable in local labour markets.

As a result, the platform is very beneficial for young people who can use it for innovative e-learning experiences and develop their employability. The platform offers a broad range of subject matters from various sectors; end users can enrol in courses that fit their individual needs and prior knowledge, at all levels and in diverse settings (students, professionals, entrepreneurs). They can benefit from videos, interactive content, badges and personalised certificates. The development of content is based on cooperation with local partners and so has a bottom-up note to it.

The use of digital microcredentials in Atingi is based on the IMS Global Open Badge Standard, which is quality-assured by packaging earner, issuer, criteria required, and evidence of competence demonstration into digital badges that can be verified and validated; it supports a competence-based approach to online training development that can be aligned with national or international skills frameworks such as [ESCO](#). Open badges can be endorsed by third parties (like employers), as well as aid interoperability and scaling, i.e. creating a skills portfolio across an open system. Private and public-sector providers collaborate to offer a wide variety of relevant skills and competences to users.

Upon registration, users are asked to identify their status and thus their need, but they can always choose to browse freely all courses available. The type of knowledge that is

intended to be conveyed on Atingi is both theoretical and occupationally specific. Courses are clustered by topics: entrepreneurship (a transversal competence), digital competences (a transversal 21st century competence), and agriculture (an occupational-specific competence) are presented alongside each other. At the same time, the courses provided address the needs of their African audience: Courses such as Artificial intelligence for development are provided by UNESCO and explore how AI can support the achievement of the SDGs (sustainable development goals). While certainly a heterogeneous audience of learners, Atingi states its mission as providing digital learning that is 'inclusive, accessible, relevant, safe, and secure' for all, which is evident in its approach to themes, attempted reach, and choice of knowledge, with African agriculture being projected to intensify even more due to population growth and improved market access. The topics 'entrepreneurship' and 'management and leadership' can help learners become more self-sustaining and self-determined business owners in their field of choice.

A gamification approach allows learners to 'level up!' by participating in courses to gain experience points. Users can access a ranking listing their position amongst other (anonymised) learners. According to Selwyn (2013), digital education often places individuals in 'personal formative cycles' (ibid, p.13), detached from harmonious learning alongside others and framing learning as a competitive behaviour and less along collective lines. This, is only true to some extent in the case of Atingi; while the option to compare one's own achievements on the platform might lead to an individualised learning mindset, and users do create individual learning paths, a larger community is created by addressing a specific, defined audience in the first place. Where generally 'the communities of learners established through these digital technologies differ considerably in terms of social diversity, obligation, solidarity and underlying structures of power' (Selwyn, 2013, p.13), this holds true mainly in terms of inclusivity and diversity for Atingi, which specifically attempts to embrace people with fewer opportunities due to gender, geographic location, or socioeconomic situation. The credentials can thus be considered purpose- and audience-specific, and with over 400 000 users reached and over 170 000 credentials acquired, an illustrative example of scenario four; microcredentials engaging both traditional and non-traditional learners regardless of previous qualifications or backgrounds, ensuring quality - and equitable - access to education.

### **Supplementary qualifications in Slovenia (scenario 1)**

Examples of short educational programs in Slovenia that are similar to the description of microcredentials are supplementary qualifications, CVET short programmes, and study programmes for further training at EQF levels 6-8. These types of qualifications are awarded outside the regulated qualification system by companies; learners complete a training programme and pass a prescribed assessment procedure. According to Cedefop (2021), the criteria for including supplementary qualifications into the SQF 'include the suitability of the applicant, relationships to existing qualifications, description of the learning outcomes, consistency and feasibility of the training programme, quality assurance of the training programme, and labour market needs'.

This example of supplementary qualifications is interesting as such a type is described (in the [website](#) of Slovenia's qualifications framework) as 'a qualification that supplements an

individual's competences at the level attained and in a specific professional field and is tied to the needs of the labour market'. The [Slovenian Qualifications Framework Act \(2015\)](#) provides that an application for the inclusion of a supplementary qualification in the SQF may be submitted by an employer, a group of employers or by the Employment Service of Slovenia.

The example below is related to a supplementary qualification DM druggist.

**Box 4. Supplementary qualification DM druggist**

Name of qualification	DM drogerist / DM drogeristka
Translated title (no legal status)	DM druggist
Type of qualification	Supplementary qualification, SQF 4/EQF 4
Category of qualification	Supplementary qualification
Duration	The entire syllabus consists of 380 hours and will be taught in 2 years. Each year is divided into 2 semesters (1st and 2nd semester).
Admission requirements	The candidate must meet the condition for enrolment: completed at least upper secondary vocational school.
ISCED field	Field Business and administration
ISCED subfield	Subfield Retail
Qualification level	SQF 4 EQF 4
Validity	Wednesday, 29. May 2019 to Tuesday, 28. May 2024

**Learning outcomes**

Upon completion of the training, the candidate is able to:

- understand the concepts in the professional field of drugstore activity;
- explain the advantages, method of use and give any warnings when using drugstore products;
- monitor development trends in the field of drugstore, healthy lifestyle, well-being and healthy diet;
- plan work in the branch and know the processes that take place in the drugstore;
- advise clients impartially and ethically, which is reflected in the non-preference of individual brands and in the well-being of the client;
- know the assortments of systemic care (conventional and natural cosmetics), natural care, dental care, child areas, decorative cosmetics, fragrances, healthy diet, food supplements, household and colouring, hair care and styling independently of brands;
- know the principles of resolving user dissatisfaction, complaints in the drugstore and acting in accordance with its responsibilities.

**Assessment and completion**

The end of each course subject is followed by the final exam of the course subject. At the discretion of the lecturer and the staff of the Human Resources Development Department at dm drogerie markt, it can be practically oriented (in writing or orally).

Source: [Slovenske Ogradje Kvalifikacij \(n.d.\). DM drogerist / DM drogeristka.](#)

This example belongs to scenario 1 as supplementary qualifications are integrated in the Slovenian Qualifications Framework (SQF). According to Cedefop (2022b), short training courses or education programmes that comply with characteristics of microcredentials and are accredited and included in NQF are more trusted in the national context. Focusing on knowledge, skills and competences acquired, it is apparent that the holder of this qualification is asked to demonstrate knowledge of the professional field of drugstore activity and also 'advise clients impartially' so there is an attempt to apply the skills and competences acquired in real life situations.

The knowledge learners are intended to acquire in this case is largely occupation-specific and contextualised within the sector and work processes in question. Even within their occupation, learners are not required to abstract decisions or transfer knowledge concepts within work or learning processes. Since these supplementary qualifications are aligned to the EQF, the qualification standards have been developed with and agreed by industry. They are outcome-based and form the basis of assessment. While alignment with the national and European qualification framework is certainly beneficial, it also limits innovation within the learning outcome statements of this example as they would rarely extend outside the prescribed requirements.

### **Professional certifications in Finland (scenario 2)**

In Finland, microcredentials and open badges are examples of new concepts related to competence-based approach and continuous learning; they are viewed as a new way to understand existing structures rather than creating something new. For example, different permits, licences and qualifications (e.g. [hygiene passport](#), [first aid certificate](#)) are examples of microcredentials already in use in the Finnish education system. Digital open badges have been prominent in Finland as an approach to microcredentialing in assessment for years (Brauer, 2020). In the information and communication technology (ICT) sector there is increasing use of badges of digital competence.

Digital competence badges for basic digital skills (nationwide open badge constellation) can be an interesting example, belonging to scenario 4; such badges are a way to give proof of specific skills and competences of end-users as a response to technological demands. According to the case study for Finland (Brauer, 2023), badge development efforts have included:

- (a) sole teacher-driven pilots for course improvement;
- (b) department level advancement on digital pedagogical practices;
- (c) discipline specific projects piloting new tools and approaches (CORE, 2021; Learning Online, 2021);
- (d) national network initiatives (Chips for Game Skills, 2021; Competitive Skills, 2021; Guild Schools, 2021; Teachers' Open Badges, 2021).

They offer a tool to the verification of prior learning by identifying and recognising competences acquired outside the formal education system, at different levels of education, and in transition phases of the education structure (Brauer, 2020; Competitive Skills, 2021). The [Competitive Skills project](#) (Competence for problem solving and ICT) is a national initiative to improve education and training and ensure that the basic skills that make individuals more

competitive on the jobs market are met. Its aim is to develop a national digital open badge system for digital skills needed in studies and employment. It will enable the verification of adults' problem-solving skills in technology-rich environments by identifying and recognising competences acquired outside the formal education system, at different levels of education, and in transition phases of the education system. The project also provides a requirement framework of competence (determining the objectives, core content and assessment criteria) for securing IT-related problem-solving skills in non-formal education. (Cedefop, forthcoming).

These skills include use and management of devices, copyrights and data security, and digital services and agreements. The skills acquired in getting the digital competence badge are compatible with the learning outcomes of the common unit 'Operation in a digital environment', included in all initial VET qualifications. As the Finnish VET system is competence-based in nature, learning outcomes are directly written into each qualification requirement. Individual requirements, or groups of these, or single study units (parts of a qualification) can be viewed as learning outcomes. They are formulated in close cooperation with the working life in the process of qualification development.

There are five levels of digital skills recognition, which equal the levels of competence in vocational education, from satisfactory to excellent. The box below gives the description of basic skills (satisfactory level) containing three out of the six badges offered. Once the end-users acquire all six badges, they earn a milestone badge.

**Box 5. Open badges for digital skills in Finland**

Choosing and using devices: recipient of the badge can

- identify and select the appropriate device (e.g., computer, tablet, telephone)
- use the most common digital devices and their basic functions and settings
- check whether they are connected to a wireless or wired network

Searching and evaluating information: recipient of the badge can

- search for information in digital environments (keywords, search engines)
- search for information in different formats (text, image, video)
- evaluate the reliability of digital content
- recognise how copyright is related to information and information sharing

Responsible action: recipient of the badge can

- recognise how the use of digital devices and applications impacts health and well-being
- use messaging services and social media services in a responsible manner
- take copyright into account when using and sharing information
- create and edit digital image content (presentation graphics) in compliance with copyrights

Source: TIEKE (n.d.). [Open badges for digital skills](#).

The action verbs used – 'identify', 'recognise', 'evaluate' – clarify the intentions underpinning the badges at this level and the focus on skills and competences rather than mere acquisition of knowledge. The emphasis on the responsibility illustrates the ability of the learner to apply knowledge and skills autonomously as well as the importance of broader competences, beyond specific occupational skills.

### Digital skills for vulnerable groups in Latvia (scenario 3 and 4)

Microcredentials have been promoted in the ICT sector in Latvia, reflecting the changes and trends in the sector at an international level. A good practice example is the project Women4IT (Innovative solutions to increase the numbers of EU vulnerable girls and young women in the digital agenda) managed by the Latvian information and communications technology association (LIKTA). This project is a multi-stakeholder partnership funded by Iceland, Liechtenstein and Norway through the EEA and Norway Grants Fund for Youth Employment. The aim of the project is to develop the digital skills of vulnerable girls and young women in line with the digital agenda in Europe.

LIKTA, together with the State Employment Agency, disseminated information in a targeted campaign addressing young women and their career and training possibilities in the IT sector and in digital jobs. As part of the first cycle of the training, women from Latvia (aged 18 to 29) completed their training, taking a 160-hour training course in one of four digital professions: digital media practitioner, data analyst, information systems tester and data protection specialist. According to the brochure produced for this project, women are supported into a digital career pathway via mentorship, training and further job placement. In the first stages of this training, they perform self-assessment to match their skills with various IT job profiles offered. Following examination, their skills and competences are certified; continuous guidance and upskilling are offered throughout the process. Another goal of the project is to engage employers in the process of preparing their (future) employees through tailor-made training programmes and filling the job openings in their companies rather than looking randomly for a potential employee in the area.

The concrete example below shows the job profile of digital media specialist, responsible for creating and managing digital-related projects in a company. The profile refers to the level of autonomy, use of ICT, mission and the typical work activities. Competences are separated into 'behavioural' competences, 'attitudes' and 'functional competences', as shown below.

#### Box 6. Digital Media specialist job profile

Behavioural competences	Attitudes	Functional competences
<ul style="list-style-type: none"> <li>- Collaborate with other professionals, teamwork</li> <li>- Exchange information verbally</li> <li>- Communicate ideas and messages in written and graphical format</li> <li>- Think strategically</li> <li>- Adapt to changes in marketing strategies</li> </ul>	<ul style="list-style-type: none"> <li>- Creative</li> <li>- Imaginative</li> <li>- Passionate</li> <li>- Adaptable</li> <li>- Open-minded</li> <li>- Goal-oriented</li> </ul>	<ol style="list-style-type: none"> <li>1. Apply customer engagement strategies</li> <li>2. Perform market research</li> <li>3. Perform image editing</li> <li>[...]</li> <li>6. Use content management software to compile and integrate media and text content into online systems, such as websites, platforms, applications and social media, for publishing and distribution</li> <li>[...]</li> <li>9. Understand data protection and privacy issues.</li> </ol>

Source: Adapted from [Women4IT project website](#).

The particular job profile specifies the main job credential holders will take on, describing the professional tasks and activities as well as the different types of competences typical of

this occupation. The focus on the competence-based approach could be translated as achieved learning outcomes if that could be validated through having the opportunity to apply the knowledge gained and the skills/competences acquired in a real working environment. The use of action verbs such as 'apply', 'perform', 'use' but also 'think (strategically)' and 'adapt' show the difference between declarative knowledge (knowing what) and procedural knowledge (knowing how) in a challenging digital market; these type of specialists are required to use online marketing tools in a creative way, so they are placed at the centre of the learning process, as active constructors of knowledge and not passive receivers.

The project Women4IT can be most readily located at the intersection of scenarios 3 and 4. An audience-specific approach that targets a key demographic throughout the process and implementation has proven successful. Before the project was piloted in 2020, interested women aged 18-29 were targeted through channels including social media advertising, with LIKTA running the campaign together with the State Employment agency. Internship opportunities following the successful completion of the programme offered women the chance to apply their learned competences in a practical context; graduates were in favour of the programme offering 'the basics in another industry for free'. The project offers stakeholder involvement from the beginning, with theoretical and practical learning going hand-in-hand, targeted to a specific group. By tailoring outreach to the intended group and matching skills levels via self-assessment and mentorship, training is customised according to individual needs. In this way, the project Women4IT succeeds in updating the skills of non-traditional learners in a lifelong learning perspective.

## CHAPTER 4.

# Concluding remarks

The focus of this working paper is on the emergence of microcredentials in vocational education and training as a way to capture learning outcomes achieved through flexible training modalities; this may be on the rise yet is still unclear. Individuals need to own a particular set of skills and make them visible to labour market stakeholders. Employers need to make sure that the skill sets that are claimed by individuals meet labour market needs. Despite their rising popularity, the environment in which microcredentials are developed is blurry. In the paper, the main argumentation is that the current buzz around microcredentials calls for an in-depth understanding of the type of learning identified behind short learning experiences.

Microcredentials tend to fly under the radar, so concentration on their profile and content improves their visibility and transparency. A key message from Cedefop's [conference on microcredentials](#) is that they are not objectives in themselves, nor free-standing instruments so they cannot be seen in isolation. They are tools:

- (a) for making learning - and skills, competences acquired through learning - visible;
- (b) to give value to the same learning, knowledge and skills, competences;
- (c) to encourage learning, motivate individuals to develop in a lifelong and life-wide perspective.

Seen as the future of lifelong learning, microcredentials are said to make learning more accessible, and thus easier to value. They are said to be more likely to be completed by students since they are small, and when they can be accumulated ('stackable') they may constitute substantial credentials. This paper, as part of the exploratory stage of current research, attempts to add to existing discourse by understanding how microcredentials work in different settings.

When microcredentials are part of larger, dependable qualifications systems and integrated into qualifications frameworks, they make existing systems flexible, as scenario one suggests. Another benefit is that when microcredentials are regulated within existing systems, they tend to come with a higher level of trust. Generally, for short training and education courses or programmes that could comply with characteristics of microcredentials, the trust depends on the quality of the content as well as on the issuer, provider and market success, as perceived by national authorities (Cedefop, 2023b). In cases where microcredentials can be accumulated (stacked) with other credentials across institutional, sectoral and national borders, this becomes an important indicator of quality. Individuals can then present a more complete picture of their learning experiences, adding to and complementing traditional certificates and diplomas. The transferability and exchange value of microcredentials depend on their visibility and perceived value to others, notably to education institutions and employers. But stacking, can be combined in various forms, which many may argue will result in even greater fragmentation of knowledge and in combinations that may not hold together logically (UNESCO et al., 2018).



The benefits of microcredentials increase when designed with transparency in mind; in scenario two the competences represented are clear and made readily available to end-users and other stakeholders. When transparency is lacking, microcredentials holders cannot realise their full value, despite investing time and efforts to obtain that credential.

The paper further suggests in scenario three that when microcredentials flourish outside and independent of formal education and training systems, they cover a variety of occupation specific skills, addressing skills mismatches, as a response to a demand-led system (this is the case for Cisco and Microsoft credentials). When the content of microcredentials aligns with workplace needs and job opportunities – so the competences they represent are relevant – their quality is affected. How key employers and employees perceive microcredentials and the companies that provide them is related to their value and reputation in this scenario.

For scenario four, examples are added showing the benefits of audience-specific, purpose-driven microcredentials in improving inclusion and opportunities for the underserved in diverse demographics. If microcredentials are purpose- and context-driven, i.e. have a clear audience in mind when they are being created, quality-assured, and distributed, they are more likely to have a beneficial effect for the learners they aim to reach. In scenario three, we have shown how providers can achieve this goal. However, this scenario might still lack oversight and transparency, and modes of quality assurance might be harder to establish.

The results generally illustrate that expectations of individual learners and employees/workers are high; this is also the case in the context of continuing educational opportunities while at the same time partaking in professional work, often care work. Learners need to be made aware of the benefits they, as individuals outside of a professional context, can share. Although the provision of microcredentials is still largely demand-driven, various initiatives show microcredentials becoming an important part of an existing qualifications and credentials landscape. In vocational education and training, a shift is observed towards the provision of transversal skills, and competences with potential for action, an attempt at providing learners with the tools to be flexible and adaptable in an ever-changing labour market. While employability might still be the foremost consideration, the knowledge, skills, and competences microcredentials in vocational education and training can deliver deserve further research and analysis.

By presenting the offer of microcredentials in different countries, areas or sectors and for diverse target groups, the paper shows that one of their basic benefits could be the accessibility of learning. They can provide an opportunity for learners - where they can afford and complete them - to acquire small blocks of learning, rather than invest in a long programme at the outset. This can benefit individuals with financial restrictions, time limitations due to family or professional commitments, or those who lack confidence and prefer not to commit to a long course. However, ensuring this benefit is realised requires the recognition of microcredentials in emerging policies such as individual learning accounts or in funding eligibility requirements. It also requires further exploration of how learning, irrespective of where it has taken place, is accredited, recognised in national qualifications frameworks and/or validated within countries (including assessing their equivalence to level descriptors and quality assurance arrangements).

The paper advocates that microcredentials are not a new phenomenon. Smaller chunks of learning and courses of short duration leading to different types of certificates already exist in many education and training sectors. One specific and crucial aspect that is experiencing change is their role, value and currency in the labour market as well as the individual, educational and societal outcomes they bring along.

## 4.1 Recommendations

In this final section, recommendations are provided for how particular stakeholder groups can expand on the findings of the paper to document better microcredentials' nature and achieve broader uptake. These recommendations are geared towards the following stakeholder groups: learners, employers and policymakers. These actors are affected for different reasons and could prioritise their actions according to the immediate benefits offered by microcredentials.

- (a) For learners: learners need shorter, upskilling formats, which suit with their daily schedules, professional needs and work-life balance, but they also need to be supported; otherwise they cannot understand the benefits of portable credentials. They need to find the right balance between individual responsibility and empowerment. Careful examination and selection of short training courses is necessary to enjoy their full potential. Heterogeneity in supply (content, length and delivery method) of microcredentials often means heterogeneity in costs, so user-centred guidance and counselling is necessary.
- (b) For employers: being responsible for recruitment practices, employers can ensure their employees remain high-skilled and competitive, thus addressing skills mismatch. They need to consider that productivity can be improved through individual empowerment, as a qualified workforce often leads to higher levels of employee retention. Employers might perceive microcredentials as a tool to hire the most competent workers, as they believe they represent the skills needed, so they should be engaged in a careful review of microcredential quality. It is important to ensure employer accessibility to accurate information about the quality and learning outcomes of microcredentials. Such transparency helps increase the perceived value of short training programmes.
- (c) For policy-makers: these play an important role in shaping the common understanding of the quality of microcredentials, as relevant research on what they offer is still lacking. They have significant decision-making powers in financial support of the development of high-quality credentials and informing citizens about the wide range of options available. Empirical data on prevalence and quality of microcredentials is limited so they should exploit as much as possible the policies and measures to be implemented in line with the Council Recommendation on a European approach to microcredentials for lifelong learning and employability, an important initiative in addressing lifelong learning.

The widening of the offer of microcredentials raises issues around their quality, and there may be differences in quality depending on the microcredential, the provider, or the specific skills and competences covered. Microcredentials are also a symptom of the dissatisfaction

experienced in the provider and earner side of education (including structural change, skills gaps); they are not the holy grail of change. But some of these recommendations can help mitigate this situation and lead to positive change. Much potential can be seen in VET in microcredentials allowing young people and the vulnerable to enter and remain in the labour market. With structural change affecting most Western societies, the potential of validating informal and non-formally acquired skills through microcredentials cannot be understated.

A complex and dynamic situation is evolving which calls for further research to establish shared conventions regarding the changes microcredentials can bring and where this might lead. Even if data are emerging, rigorous evaluations are needed to understand labour market returns for the individual as well as inform policy making. This working paper should help stimulate debate on the characteristics and strengths/weaknesses of microcredentials, identifying what support can ensure their benefits are realised.

# Acronyms

AIR	American Research Institute
COVID-19	COVID-19 coronavirus also known as Severe acute respiratory syndrome (SARS) coronavirus 2
CVET	continuous vocational education and training
ECD	Europass digital credentials
EEA	European economic area
ESCO	European Skills, Competences, Qualifications and Occupations
EU	European Union
FET	further education and training
ICT	information and communications technology
LIKTA	Latvian information and communications technology association
MOOCs	massive open online courses
NFQ	national framework of qualifications
NQF	national qualifications framework
NZEB	Nearly zero-energy buildings
NZQA	New Zealand Qualifications Authority
NZQCF	New Zealand Qualifications and Credentials Framework
RPL	recognition of prior learning
SOLO	structure of observed learning outcomes
UNESCO	United Nations Educational, Scientific and Cultural Organisation
VET	vocational education and training

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# Annex

Figure 5. **Formulation of learning outcomes in the register**

Title	Level	Credits	Developer	Approval Date	Review Date	
<b>AWS re/Start (Micro-credential)</b>	5	40	Unitec New Zealand Limited	03/2021	07/07/2022	⏪
<b>Advocacy within a Health Care Environment (Micro-credential)</b>	4	10	Kalandra Education Group Limited	11/2021	04/10/2022	⏪
<b>Applied Payroll (Micro-credential) (Level 5)</b>	5	15	Southern Institute of Technology Ltd	08/2020	05/08/2022	⏪
<b>Aquatic Fish Industry Skills (Micro-credential)</b>	3	40	Bay of Plenty Technical Institute Limited	12/2021		⏪
<b>Assess Candidate Performance using Micro-credentials (Micro-credential)</b>	4	5	Otago Polytechnic Ltd	11/2018		⏴
<p><b>Aim</b> The holder of this EduBit can make valid judgements and provide feedback on candidate performance against approved assessment criteria, complete assessment administration, and review own assessment practice.</p> <p><b>Outcome</b> To earn this EduBit evidence must be provided to demonstrate the ability to:</p> <ol style="list-style-type: none"> <li>1. Make valid judgements and provide feedback on the candidates's performance using approved assessment criteria.</li> <li>2. Complete assessment administration in accordance with stakeholder requirements.</li> <li>3. Review own assessment practice using stakeholder feedback.</li> </ol> <p><b>Education Organisations that can deliver this Micro-credential</b> Otago Polytechnic Ltd</p>						
<b>Assess and Review HACCP Requirements in a Food Processing Operation (Micro-Credential)</b>	5	20	Primary Industry Training Organisation	10/2020	13/10/2022	⏪
<b>Assist with Dairy Farming Mating, Calving and Neonatal Care</b>	3	30	Primary Industry Training Organisation	11/2020	30/10/2022	⏪
<b>Assist with Management of Livestock Health and Biosecurity</b>	3	20	Primary Industry Training Organisation	11/2020	30/10/2022	⏪
<b>Assist with Milk Harvesting and Optimising Milk Quality</b>	3	30	Primary Industry Training Organisation	11/2020	30/10/2022	⏪
<b>Assisting with Operating Dairy Effluent Management Systems (Micro-credential)</b>	3	10	Primary Industry Training Organisation	11/2020	30/10/2022	⏪
<b>Barista Training and Customer Service Fundamentals (Micro-credential)</b>	2	5	Making Futures Happen International Institute Limited	07/2019	14/07/2021	⏪

Source: NZQA (n.d.). Register of NZQA-approved Micro-credentials.

## EXPLORING THE EMERGENCE OF MICROCREDENTIALS IN VOCATIONAL EDUCATION AND TRAINING (VET)

This working paper aims to critique the emergence of microcredentials in vocational education and training. It argues that considering microcredentials as a new tool to reorient higher or academic education overlooks the potential of vocational and professional education as well as its aim to equip learners with employability skills, in line with increasing labour market demands.

The paper attempts to shed light on learning outcomes of credential holders, as visualised in four distinct scenarios developed. These scenarios are intended to show abstract representations of existing types of microcredentials and could be used to enable critical discussions and a dialogue about the purposes of microcredentials.

The paper also provides recommendations for policy and practice targeted to specific stakeholder groups.

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