Case study Ireland

Microcredentials for labour market education and training volume

First look at mapping microcredentials in European labour-market-related education, training and learning: take-up, characteristics and functions

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CHAPTER 1. Introduction

1.1. Purpose of the report and methodology

This report provides a case study for Ireland on microcredentials in labour market related education and training. It forms part of the wider study on microcredentials commissioned by Cedefop over the period 2021-23.

The report was undertaken during 2021 and analyses information from a number of sources. As well as conducting desk research, nine semi-structured interviews were conducted with key stakeholders in the public and private sectors. Data for Ireland from the European survey that was conducted as part of the wider study in the summer of 2021 was also used.

It is important to note that, as part of a wider study, the aim of the case study was to capture the main features of the microcredentials landscape and how these have been evolving in recent years, rather than to provide an extensive analysis. Thus, an important limitation of the case study is that it is necessarily based on a limited number of interviews. It should also be noted that care has been exercised in interpreting data from the survey since there were just 12 respondents from Ireland in total (although these did span all the main stakeholder groups, i.e. national and regional authorities VET providers, employer organisations and employee organisations, and data could be cross-checked against the much larger European sample). A further limitation in Ireland, as elsewhere in Europe, is the lack of systematic data on microcredentials ([1]), although a number of steps have been taken in Ireland to address this issue in recent years, which provides a number of useful sources that have been used in the case study. Notwithstanding these limitations, we have confidence that the case study provides an accurate reflection of the key elements of the current situation in microcredentials in labour market related education and training in the country.

1.2. Overview and context

Microcredentials in labour market related education and training have a long history in Ireland, existing in the form of short courses and certificates long before the term existed. The situation was neatly summed up by a participant at the Cedefop microcredentials conference of November 2021: 'Ireland have had

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(1) As noted by Dr Mark Brown at the Cedefop conference on microcredentials, November 2021.

microcredentials (not the term) in our National Qualifications Framework (NQF) since establishment in 2003 and they were included because they existed even before then, particularly in VET.'

Microcredentials, understood in this way, are widely available, mainly to adults but also as part of some IVET programmes, being seen as playing a valuable role in skills development and recognition. At the same time, there is much variation in the size and 'shape' of microcredentials, in who offers them and who uses them, and crucially in the quality standards that underpin them, which makes it difficult for employers, learners and VET providers to have confidence in everything in the wide and varied microcredentials 'landscape'.

A recent skills policy shift towards workforce development is driving interest in microcredentials and there is also growing focus on microcredentials amongst employers. There is a common consensus that microcredentials have a valuable role to play in upskilling and reskilling and in keeping up with the rapid pace of change in skills needs. The modular nature of the qualifications system already accommodates free-standing qualifications and qualifications as small as five credits; and credentials smaller than this can be used as steppingstones into qualifications on the National Framework of Qualifications (NFQ) by being aggregated and used in recognition of prior learning (RPL).

If microcredentials in Ireland are understood, as one interviewee put it, as 'old wine in old bottles but with new 'labels' or outer packaging' ([2]), why is this? Understanding the current situation in Ireland requires us to understand the context of the overall skills development system, many -but not all- of whose characteristics Ireland shares with the UK. Typically, both are classed as 'liberal market' systems ([3]) or as systems in which initial VET overall has mostly only weak connections to occupations in the employment domain ([4]), with emphasis traditionally placed on employers to skill people – or individuals to skill themselves – according to the specific (often narrow) needs of individual companies once they have left compulsory education. This weak connection is accompanied by highly flexible qualification regimes and cultures. In the UK it is also accompanied by high levels of adult learning, as something of a counterweight to the weak labour market links of initial VET, whereas in Ireland this is not the case, which is rightly seen as problematic in view of this structural context. This is reflected in one of the surveys reported below which found that certified training obtained outside the formal

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(2) Interviewee

(3) Sometimes also as 'Anglo-Saxon' but this is clearly a misnomer in Ireland and the Celtic fringes of the UK; the Angles and Saxons never reached these areas.

(4) Though with notable exceptions as in some occupations which are linked to apprenticeships in Ireland.

system is regarded as important to many stakeholders. Thus, in a sense, it comes as no surprise to find that Ireland is both well placed in terms of its systems and cultures around qualifications to accommodate microcredentials (MCs), and that, as a recent report funded by Skillnet Ireland pointed out, microcredentials are seen by many labour market stakeholders as 'a critical component in deploying the learning programmes of the future.' (Nic Giolla Mhichíl et al., 2020). Indeed, amongst these stakeholders ambitions are high, as the same report goes on to say: 'building on Ireland's position as an open, industry-supportive economy with a highly educated and skilled population, Ireland can become a global leader and provider of Microcredentials for work based and applied learning.' (Nic Giolla Mhichíl et al., 2020).

Another important characteristic of the Irish system is that 'VET' is not used. Instead, the term Further Education and Training (FET) is used. Conceptually this means that a strong distinction is not made between IVET and CVET and institutionally they are not separated but are incorporated into FET, which also includes adult and community education up to EQF level five. A range of organisations deliver programmes both for young people who have just completed their compulsory education and for those who wish to upgrade their skills having completed initial education and training. Courses may distinguish IVET and CVET, but qualifications often do not. It is the status of the trainee that determines whether the education/training is initial or continuing rather than the system itself. This is also an important context for the development of MCs.

CHAPTER 2. Analysis of the take up, characteristics and functions of microcredentials

This section uses surveys, documents, and interviews to look at key aspects of the microcredentials landscape: the familiarity of different stakeholders with the term and how they understand and define it; recent developments including at policy level; the key providers and users of microcredentials; the extent of use; their key characteristics; and finally zooms in on the education and the information and communications technologies (ICT) sector.

2.1. How familiar are the stakeholders with the term of microcredentials?

Short courses and certificates have always been part of the FET landscape in Ireland and there is in general familiarity with the term 'microcredentials' as expressed by interviewees and respondents to the survey. There is no 'official' definition of the term and so the term tends to be understood in broad terms as capturing the wide range of short course provision in Ireland (see next section).

There is also a general awareness, as articulated by interviewees that microcredentials are increasing in importance. One respondent to the VET provider survey summed up the position well in stating: 'a wide range of standalone modules are available … Though these modules are not yet branded as microcredentials per se, it is our intention to improve our offerings by adding new bespoke, enterprise-focused microcredentials to the existing modules.'

Amongst employers and employees some (limited) data from two pieces of research, discussed in this section, gives a general indication of familiarity with MCs, although both surveys have small sample sizes and do not differentiate according to type or level of education and training (i.e. FET or HE), and there are some inconsistencies in responses. Nonetheless, they both indicate the limited penetration of MCs into labour market training to date – and associated low levels of understanding.

The first piece of research was a 'National Microcredential Survey', which was undertaken in summer 2020 to investigate employers and employees' understanding and perceptions of the potential of microcredentials to support continuing professional development and lifelong learning more generally (Nic

Giolla Mhichíl et al., 2020). Data was collected from 61 employers and 160 employees.

Amongst employers it found that 51% had not heard of MCs and 43% said they were knowledgeable to some degree about them. Amongst employees ([5]) 63% had not heard of MCs, although 58% said they were knowledgeable in some way; the reasons for this apparent contradiction are not given.

The second study was of 53 participants (employees) in two 20-hour programmes leading to digital badges in the food and agri-food (sic) sector. It found that 'MC' was not a term familiar to any of the participants, although 1 in 10 had heard of digital badges. Of the 10 companies involved in the study, two had heard of digital badges.

These findings resonate with the findings of a pilot of digital/open badges by University College Dublin in 2016-17, which found that there was a low level of awareness and understanding of digital and open badges amongst recipients of pilot badges. The pilot also found 'uncertainty about the recognition given to open badges by employers and educational institutions', although feedback from both badge recipients and badge issuers was found to support the continued and further use of badging ([6]).

2.2. How are microcredentials defined by different stakeholders?

As pointed out by interviewees, there is currently no 'official' definition of MCs in policy documents (but see the section below where current strategy and activities are discussed). Indeed, in contrast to some other countries, terms like this are not generally safeguarded in legislation in Ireland, which already provides certain underlying flexibilities within the system ([7]).

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(5) NB 73% of the employee respondents had a bachelor's degree or above, and 24% worked in the education sector, so we might reasonably suppose that they might be more knowledgeable about learning opportunities in general than the workforce as a whole

(6) University College Dublin Teaching and Learning (2017) UCD Digital/Open Badges Pilot 2016/2017 Implementation and Evaluation Report, p. 3

(7) This is partly related to the 'common law' legal system, which exists in Ireland (and also England) and which stands in contrast to the civil law system in most of Europe, and which – to grossly simplify - rests on the assumption that actions are to be considered legal unless the law says otherwise and which tends not to establish legally binding definitions of terms (e.g. I understand the term 'recognition' in relation to qualifications is protected by law in some countries).

The qualifications authority, QQI, has an internal and informal working definition, which it uses when referring to MCs in a narrative context. In a press release in January 2021, it stated: 'microcredentials are units of assessment that are smaller than traditional programmes of learning such as degrees and diplomas. They demonstrate that a learner has mastered a certain skill-set or demonstrated a level of achievement in a particular area.' (QQI, 2021).

And a recent QQI technical discussion paper on the qualifications system gave this definition in its glossary: 'microcredential: a qualification that attests to a small-volume, highly specific learning achievement. The term often arises in the context of digital badges.' (QQI, 2020a).

As one interviewee stated, 'no one will own the term microcredentials'([8]). In the absence of an official definition, and as noted in the preceding section, the term 'microcredential' tends to be understood broadly by all stakeholders in terms of the practice of providing short courses and certificates. The following quotation from the survey summarises how many stakeholders view microcredentials: 'depending on what they are, they are just a new word for old small, short programmes. And some people think micro is 125 learning hours and some people think 4 hours is micro. And what can one realistically build from multiple four-hour blocks.' And yet this also sits alongside the view that: 'the concept of microcredentials is relatively new in Ireland and is yet to be fully researched and explored at policy and educations levels.'

As the survey shows, a range of terms were identified by stakeholders as corresponding to 'microcredentials' including micro-qualification, digital badge, modular and component. Evidence from the surveys also suggests that a wide range of small or alternative credentials and microcredentials is offered by VET providers, employers/employer organisations, and employee organisations including: professional certificates, academic certificates, open badges, vendor-specific and vendor-neutral certificates, digital credentials, digital badges.

Outside formal circles, recent documents offer these definitions of microcredentials:

(a) according to QQI (2019): 'open badges are known as visual, digital emblems displaying the accomplishment of various achievements sharable across the web. Microcredentials also known as digital badges represent and communicate accomplishment, skill, achievement or interest earned in many learning environments.' (QQI, 2019);

(b) in the food sector: 'a digital badge or a microcredential is an image, icon or indicator of an accomplishment that can be verified online. They can be

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(8) Interviewee

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awarded for short courses that meet certain verified criteria. Unlike a certificate of attendance, digital badges offer tangible and practical awards for employees continuing to develop their skills … Digital badges are a type of digital credential and fall under the umbrella term 'microcredentials'. Microcredentials are digital credentials. They encompass digital badges, web badges, nano-degrees, mini-degrees and microcertifications'. (Corrigan-Matthews and Troy, 2019);

(c)   in a 'roadmap' commissioned by Skillnet Ireland and five Skillnet partners covering a variety of industries including aviation and food and drink: 'microcredentials are [for the purpose of the report] smaller units of assessed learning recognised by higher education institutions and other trusted credential-bearing agencies or professional bodies.' (Nic Giolla Mhichíl et al., 2020).

Interestingly, the studies which include these latter two definitions rather side-step the question of how the digital badges or MCs in question are positioned within existing systems for valuing learning, whether these be formal ones (as through NFQs) or informal, socio-economic systems (where qualifications or jobs with certain employers might accrete value as de facto routes into certain jobs or sectors.)

The digital badges referred to in the food sector study already referred to are part of a portfolio of 'short courses' run by the food industry training unit at University College Cork. Only some of these courses currently lead to digital badges. Where a badge is awarded, the following description is provided on the website: 'upon successful completion, you will be awarded a digital badge which can be used to support your CV and e-portfolio. A digital badge is an award which recognises your accomplishment in completing an unaccredited course and is referred to as a microcredential. By taking part in the in-course activities and successfully completing the in-course questions you will qualify for a digital badge. The badge can be downloaded and included on CVs, shared via email, or included on your e-portfolio (for example on LinkedIn). When a person or employer clicks on your digital badge they will see the specific details of the course, the process by which the course was given and if the course was successfully completed. Digital badges can be used to illustrate continued professional development and can supplement existing qualifications.' ([9])

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(9) For more information see:
    https://www.ucc.ie/en/fitu/courses/foodsafetyandqualityaudits-apracticalapproach/#digital-badge-award

2.3. Are microcredentials or similar credentials referred to in policy discussions and strategic documents? What are the main activities related to microcredentials that are taking place in different contexts? What are the recent developments related to microcredentials?

FET in Ireland has a long tradition of unitised training where people can take small qualifications (typically 150 hours of learner effort) as they need them and combine them to gain major qualifications (e.g. involving 1 200+ hours at Level five of the Irish NFQ). However, most recently, part of the basis for government intervention in relation to short courses/MCs has been provided by the 2018-21 policy framework for FET for people in employment set out in 'Supporting Working Lives and Enterprise Growth in Ireland.' (SOLAS, 2018). Implementation of the policy is overseen by the Department of Education and Skills and SOLAS (the state agency responsible for FET), working closely with Education and Training Boards (ETBs, the main FET providers).

The policy framework is intended to: 'enable targeted support for vulnerable groups in the Irish workforce, particularly those who have lower skills levels and who need more opportunities to advance in their working lives and careers, to sustain their employment and to avoid displacement or to avail of emerging job opportunities. The policy also supports small and medium-sized enterprises (SMEs) who need some assistance to invest in and develop their workforce. While employers are primarily responsible for the skills development of their employees, and employees have responsibility for their own development, this policy will complement employer-based and state initiatives underway, through targeted support and investment by government.' (SOLAS, 2018).

The underlying vision is for a situation where upskilling throughout life is the norm, where companies systematically invest in staff development and where FET provision to support employee development is 'flexible, high quality, accessible and relevant to the changing needs of employees, the economy and industry.' (SOLAS, 2018). The goal is that by 2021, 40 000 workers will be undertaking state-supported upskilling.

Although, this policy framework does not discuss qualifications or programmes in any detail and makes no mention of MCs, it does mention qualifications in relation to one of its three target groups, namely employees in all parts of the workforce whose skills level is below Level five on the National Framework of Qualifications (Level four EQF):

'Such employees can access upskilling opportunities free-of-charge across relevant further education and training provision. There will also be a particular focus on employees who are in jobs with a low skill requirement, 50+ years of age, and in sectors/occupations at risk of economic displacement. It is acknowledged that this will require innovation by ETBs in outreach, guidance, design and delivery of programmes that target persons at risk of displacement and areas of activity such as caring services, retail and manufacturing where upskilling can impact significantly on earning capacity and security.

The Department of Education and Skills has committed to the development of a national policy on the Recognition of Prior Learning (RPL). This policy, when developed, will provide a framework for ETBs and other providers to offer opportunities to employees to have skills recognised through RPL mechanisms.' (SOLAS, 2018).

The other two target groups are SMEs and other organisations without the capacity to identify and meet skill needs, and industry sectors with skill needs stemming either from new business opportunities or economic vulnerability.

To address the policy framework's goals, SOLAS launched the national initiative, Skills to Advance ([10]) (2019-21), which aims to 'enable targeted support for vulnerable groups in the Irish workforce, those who have lower skills levels and who need more opportunities to advance in their working lives and careers, to sustain their employment and to avoid displacement or to avail of emerging job opportunities. The policy also supports small and medium-sized enterprises (SMEs) who need some assistance to invest in and develop their workforce to adapt to changes in work practices, technology and markets'([11]) (p. 1). The scheme is implemented through FET and specific Skills to Advance programmes delivered by the 16 Education and Training Boards.

In 2019, an innovation fund was launched to support the large step up required from ETBs to deliver the flexible learning opportunities needed. The fund encourages ETBs to work together, and with enterprise partners, to develop solutions and responses to meet the needs of engaging with employees and enterprise. From this fund there are currently 10 projects which are heading into a mainstreaming phase, due to complete in Q4 2021/Q1 2022, some of which now have MC relevance (see below).

Around the same time as the innovation fund was coming into being, SOLAS adopted its strategy for 2020-2024 (Future FET: Transforming Learning) (SOLAS, 2020), which appears to be the first time MCs have been mentioned at a

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(10) For more information see: https://www.solas.ie/programmes/skills-to-advance/

(11) General Block Exemption Regulation (The Regulation) Skills to Advance Scheme 2019-2021

policy/strategy level in Ireland. Here, microcredentials are framed as a FET resource for enterprise and employees, while also facilitating pathways for lifelong learning, and supporting RPL processes: 'use of digital badging and microcredentialing will … be important as we move into an era of FET provision which can be tailored to meet the needs of learners and employers and can be made available in bite-sized chunks to facilitate accessibility.' (SOLAS, 2020).

At the back of the strategy document, this text is provided: 'microcredentialing: Attaining a micro or digital credential. Examples include digital badges, web badges, nanodegrees, mini-degrees and microcertifications.' (p. 67)

Returning to the Innovation Fund projects, a number of them faced similar challenges in engaging employers or employees, in particular that both employers and employees value 'bite-sized' opportunities or are reluctant to initially engage/commit to the level of a full award. QQI have already applied an approach to microcredentials in HE (see section 3.1 on the qualifications system), so SOLAS intends to use the Innovation Fund projects to pilot three approaches with QQI to validating new special purpose awards, composed of stackable certificated modules or microcredentials in the FET context. QQI has developed a Microcredential Validation Descriptor in the context of HE, which will be refined by QQI in consultation with the provider ETBs and SOLAS.

In addition to these approaches to micro credentials, two projects are using badging from an international provider, City and Guilds (the well-known provider of awards headquartered in the UK):

(a) RPL Framework for the Irish Hospitality Sector (marketed as Your Future Your Skills) is currently offering C&G badges to individuals in the hospitality sector, either directly or through their employers;

(b) development of Innovative Delivery Modes for Existing and Future Near Zero Energy Buildings (NZEB) Curricula project is using C&G 'Assured' badges across its NZEB related programmes.

Unpacking the latter example is informative in relation to some of the new players and relationships emerging around microcredentials (see box below).

Box 1. How microcredentials link local short courses to global credentialing: training in Near Zero Energy Buildings

Since 2019, all domestic and non-domestic buildings in Ireland have been required to meet national NZEB standards and a European directive came into effect in 2020 which requires new and existing builds to reach an NZEB standard over a phased period. All construction professionals will thus need to undergo upskilling to meet the requirements of the standard. To meet this demand, 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 etc.) The programmes are delivered at two of the ETB's training centres and are the first trade-specific courses in Europe. They range in duration from one to four days, and each trade-specific course is a mix of online delivery and a one-day workshop. Each course costs EUR 100 per day, and each trade course costs EUR 300.

All these programmes are 'assured' by City & Guilds, as well as being approved by the Construction Industry Federation. 'Assured' is a programme recognition service provided by City & Guilds, which benchmarks programmes against their quality standard. Learners who successfully complete any of the City & Guilds Assured Training Programmes receive a digital badge, which 'allows learners to recognise and communicate learning achievements and certifications online in a secure way.' City & Guilds' digital badges are provided through the Credly platform. City & Guilds has had an investment stake in Credly since 2016. There are more than 1 900 City & Guilds digital badges on the Credly platform. Credly itself was founded in 2012 and in 2013 became the first to issue digital credentials that were 'Open Badge' compliant. In 2018 it acquired Pearson's Acclaim, becoming the largest credential network. It has issued more than 35 million badges. Its investors include City & Guilds Group, Pearson, the Lumina Foundation as well as strategic and venture capitalists.

Source: prepared by an author.

In relation to digital badges, SOLAS has a national certification agreement with Certiport (a Pearson VUE business) on behalf of the FET sector to access industry-recognised examinations and certifications. These certificates are issued as part of publicly funded FET programmes organised by ETBs and SOLAS will fund a programme where these industry certifications are either the only certification, or are combined with QQI qualifications, and learners are awarded digital badges as standard on passing their exam. Around 4 000 certifications of this nature are issued each year in FET, mostly in relation to Microsoft and Adobe subject domains.

The most popular by far is the Microsoft Technology Associate (MTA), which forms the basis of a number of traineeships, but can also be used as the certification on other publicly funded initiatives such the SOLAS-funded Covid recovery initiative Skills to Compete. SOLAS eCollege programmes offer several different industry certifications through the Certiport agreement

including MOS, Adobe and MTA certifications, and ETBs also offer these qualifications as either standalone or parts of programme. A learner can get exemptions for their Microsoft qualifications against specific QQI-validated programmes ([12]).

Interestingly, the multi-national Prodigy Learning, which provides digital skills certifications and learning solutions for Adobe, Autodesk, Microsoft and other technologies and is the national franchise holder for Certiport in Ireland, has worked closely with some ETBs for a number of years through the National Agreement for Certification mentioned above. Some ETBs have been given Prodigy Learning awards as 'Centres of Excellence' (e.g. Limerick) or 'Outstanding Centres of Excellence' (Dundalk Regional Skills and Training Centre.)

The advantage of having a national agreement is centralised purchasing. SOLAS's agreement means essentially unlimited usage of certifications at no local cost to the FET provider. A FET provider must set up as a Certiport test centre for their learners, but there is no cost to them for doing this, and substantial savings are achieved by purchasing at volume for the sector (for more information see section 8.2.3).

2.3.1. Recent developments in Higher Education

It is worth noting the recent launch of the Human Capital Initiative (a government education fund), which, amongst other things, is funding a major MCs project being undertaken by the Irish Universities' Association (IUA). EUR 12.3 million will be used over five years (2020-24) to establish a Multi-Campus Microcredentials (MC2) system across seven universities over the next five years. Through the MC2 project, the IUA universities will establish a coherent framework for designing and recognising ECTS-bearing microcredentials, a system of certified qualifications in short courses delivered in flexible formats. It will enable universities to extract and adapt high-demand modules from existing programmes, and develop tailored courses, to suit the needs of enterprise and learners. MC2 microcredentials will be accredited by each university and included within the National Framework of Qualifications. The Project will set up:

(a) an academic framework for the design and recognition of microcredentials;
(b) an enterprise-led partnership to facilitate demand-side interests;
(c) a portal to promote awareness of microcredentials, linked to a digital credentialling solution (potentially Europass);
(d) the stimulation of new standalone microcredentials across the seven universities.

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(12) QQI does not design or prescribe programmes, it approves programmes proposed by education and training providers.

Key drivers for the project are the development of lifelong learning; upskilling/re-skilling as part of COVID recovery; the digital and green transitions; and the resulting wish to develop microcredentials that are short and capable of being offered as stand alone, stackable and portable qualifications, and which are included within the NFQ and underpinned by QA (QQI, 2021).

Commenting on the announcement, IUA Director General, Jim Miley said the programme 'will enable Ireland to become the first country in Europe to establish a coherent, fully accredited programme of quality-assured microcredentials across the network of universities.' ([13])

2.4.   What is the extent to which microcredentials are used in the labour market related education, training and learning?

Microcredentials understood as small or alternative credentials are commonly used throughout labour market related education, training and learning, as reported by all interviewees. They are used in both publicly funded provision, either as standalone credentials or linked to full programmes and qualifications (major awards). Microcredentials in the form of vendor-specific and vendor-neutral certificates have an important role to play in some sectors, notably ICT.

Interviewees indicated that there has been a major increase in short course provision during the pandemic and as a result of the Skills to Advance agenda (see section 2.3). The pandemic has 'opened up a new world' for people regarding taking short courses ([14]), not just online but in terms of overall awareness of the availability of provision, boosted by SOLAS making the courses available on its eCollege platform free of charge in March 2020. It also led to the take-up of some specific modules like one in infection prevention and control in the care sector. Online courses are reported to have been so popular it is proving difficult to get people back to physical courses ([15]).

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(13) For more information see: https://www.iua.ie/press-releases/iua-press-release-5th-oct-iua-breaks-new-ground-with-e12-3-million-mc2-microcredentials-project-under-hci-pillar-3/

(14) Interviewee

(15) Interviewee

In 2018 it was reported that of over 5 000 training and education programmes for businesses delivered by the Skillnet Network ([16]) in 2017 'over 50% were non-formal and offered some kind of industry-specific microcredentials' (Flynn, 2018).

In 2021 QQI published an analysis of MCs in Higher Education (defined as a HE qualification involving up to and including 30 ECTS) (QQI, 2021) included in the NFQ, i.e. in the Irish Register of Qualifications. It is important to note that QQI HE awards account for a small fraction of all HE awards in the NFQ (less than 8% of all awards made in the HE sector are made by QQI) and hence the data set is small. Nonetheless, the analysis signals some interesting trends for the period it covers, 2014-20. Notably:

(a) MCs are growing in scope, covering different fields of learning/industry sectors;

(b) a rising number of institutions is entering the MC field;

(c) business, administration and law stands out as a popular field for MCs.

(d) part-time delivery is dominant;

(e) MCs tend to focus on narrow components of a learning area that is work-related, suggesting that learners are seeking to upskill or reskill in a particular narrow knowledge area, and/or authenticate an existing skill or knowledge area with a certification;

(f) provision has been extended to target a wider group of learners and QQI microcredential holders are becoming more diverse in terms of age and gender.

At what is termed the 'third level' in Ireland, a 2019 study reported that digital badges have been most popular in the 'academic' and information technology (IT) sectors and the National Forum for the Enhancement of Teaching and Learning in Higher Education (which develops and provides teacher training([17]) 'has been a key driver of digital badges within the education system in Ireland', developing a specific digital badge system for Irish higher education (Corrigan-Matthews and Troy, 2019). This embracing of digital badges to improve teaching and learning in HE is an interesting aspect of developments in Ireland. The study also found that around 30% of third level institutions were then offering digital badges of some

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[16] The Skillnet Network is funded from the National Training Fund (NTF) through the Department of Education and Skills (DES) to support groups of companies in the same region/sector with similar training needs to collaborate through training networks that deliver subsidized training to Irish businesses. Currently 70 Skillnet Business Networks are funded, supporting over 18 000 companies and 70 000 trainees across the country. Member companies determine their own training needs and how, when and where training will be facilitated through both formal and informal learning that spans further education and higher education provision.

[17] For more information see: https://www.teachingandlearning.ie/

kind: 'These digital badges vary considerably between institutions, but a large proportion have developed through a university or national project.'

In the National Microcredential Survey, the following results were found for employers:

(a) 40% said they never came across a candidate who mentioned a microcredential in their job application; 40% 'sometimes'; only 8% 'most of the time' (zero 'always');

(b) 85% said certified training gained outside formal education was moderately to extremely important in recruitment and 79% are or would be interested in integrating MCs into training or CPD;

(c) potential benefits mentioned were: recognition (81%), building a culture of continuous development (77%). improve employee engagement in CPD (70%), structured approach to training and learning (66%), address widening skills gap (64%), improve employee retention (55%), leverage workforce capabilities (51%), improve company competitiveness (49%), deliver training on demand (47%), quantify skills for planning purposes (28%), improve transparency (19%);

(d) 33% thought it very to extremely important that MCs come under a recognised qualifications framework and 51% moderately important;

(e) flexibility was the most important factor that would influence decisions to integrate MCs into CPD/training (77%) followed by ability to personalize, cost, stackability, validation from recognized training provider, assessment, accreditation (67-58%). Portability was considered influential by only 5% (which is not surprising as a risk with training is that people use it to leave an employer, though this contrasts with what employees say they will use MCs for, see below).

Amongst employees:

(a) 20% said they had earned a MC and 39% were unsure;

(b) 96% would be interested in earning a MC, although 81% already do CPD;

(c) if they possessed a MC 82% would put it on a CV, 74% would mention it in a job interview, 68% would include it in a LinkedIn profile or other social media, but only 35% would look for ways of using the MC as a pathway to a higher qualification and 5% wouldn't do anything with it;

(d) asked about what their objectives for obtaining a MC would be, 84% said to keep current job skills up to date, 71% to keep up to date with developments in their sector; whilst interestingly only 45% said to learn new skills to be able to change job/sector and 40% to obtain promotion;

(e) regarding factors influencing participation in CPD leading to a MC, only 30% cited whether it contributes to a larger qualification, with more people

considering international recognition important (40%), whilst the most common was time availability (83%) followed by cost (73%), and quality of the provider (71%), then length of time to complete, level of employer support, relevance to career goals, mode of delivery (66-62%).

Although not mentioned in the report on the survey, there are two interesting points emerging from this about perceptions of MCs by the individuals who might take them:

(a) MCs seem to be more likely to be perceived as having less value compared to large, traditional qualifications since they would not be universally used in contexts where they might be helpful (CVs, job interviews, social media);

(b) MCs are most likely to be seen as useful for comparatively narrow purposes related to existing jobs (keeping skills up to date or keeping in touch with latest sector developments), rather than wider purposes of career progression, further learning etc. (only minorities would use MCs to change job or seek promotion, and links to larger qualifications are least relevant in influencing decisions to seek MCs).

The study of two programmes leading to digital badges in the food and agri-food (sic) sector mentioned above found that 80% of trainees believed that earning a digital badge would be useful or very useful to them in the future, and 96% would be happy to display a digital badge on their online profiles. Almost all of them believed HR managers should take digital badges into account during recruitment and promotion processes. Asked to share a word or phrase they thought best reflected digital badges, amongst the most frequently mentioned (by two thirds of the group) were credible, easy to access and recognition.

On the employer side, responses to the badges were more mixed. Although 70% of enterprises were positive about the concept of digital badges, only 30% believed that digital badges would benefit their business positively with the remaining 70% saying it was difficult to assess without any previous knowledge or experience of badges.

2.5. Who are the main actors providing learning activities leading to microcredentials and issuing microcredentials?

A wide variety of actors are involved in offering microcredentials and their associated learning activities including formally recognised education and training

providers, big technology companies, private accredited providers and employers' organisations ([18]).

A key feature of the microcredentials landscape is partnership. As revealed in the survey and through interviews, whilst microcredentials are commonly offered by providers on their own, they also do so through partnerships, which are very varied and include working with providers in both the public and private sectors and with the organisations associated with the provision of vendor-specific and vendor-neutral certificates (see, for example, section 2.8.2). Microcredentials thus often involve more complex arrangements between providers than provision related to full qualifications (e.g. in IVET).

The key publicly funded training providers, the ETBs, make a wide range of provision according to the needs of industry and of individuals, as reported by interviewees, and in order to deliver government-funded programmes which may require the delivery of, for instance, short courses to support jobseekers and increasingly to employees for workforce development purposes. Indeed, ETBs have always provided a wide range of courses from long programmes leading to QQI Major Awards to short courses to meet more specific needs, e.g. in Adobe graphic design, marketing, welding, bookkeeping. They also deliver parts of full QQI awards in order to respond to local needs. As noted elsewhere, ETBs also have scope to integrate the MCs available via the national certification agreement with Certiport into programmes and qualifications. Owing to the amount of local autonomy that ETBs have, there is enormous variation in MCs provision geographically and sectorally.

Government funding (e.g. around workforce development), plays a key role in shaping provision, including in relation to short course provision. Licencing requirements also play a role in MC provision (e.g. for welding), where licences last for only two years and then need to be renewed. Government support is available for these licences as part of job support policies.

2.6.   Who are the main users of microcredentials?

The main users of microcredentials as mentioned by interviewees and survey respondents tend to be mainly adults in employment. However, other groups who also make use of microcredentials include some people in IVET courses where those courses might include alternative credentials and the unemployed.

The issue of who mainly uses microcredentials is closely linked to the issue of the purpose of microcredentials. The need to upskill and reskill adults (both

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([18]) VET provider survey, and employer survey

employed and unemployed) emerged prominently in the interviews and in the survey, as did the need to validate and recognise prior learning. VET providers noted in the survey that microcredentials are used in all fields of education, but are especially prominent in ICT, engineering, manufacturing and construction as well as business, administration and law. In terms of skill level, microcredentials are used across the spectrum from managers and professionals to machine operatives and people working in clerical support and sales.

2.7. What are the main and most important characteristics of microcredentials?

MCs as currently used span an enormous range of types and sizes with varying forms of assessment and accreditation. Both interviewees and survey respondents indicated that MCs do not conform to a standard pattern in terms of their characteristics; indeed, they are as varied as the types of delivery modes and assessment methods available. Depending on the provider and the MC, MCs are delivered through on-site, online and blended methods, and the credential itself can be issued in paper, secure digital and non-secure digital formats. There is also much variation in assessment practices related to MCs. The VET provider survey shows that assessment can be undertaken – depending on the provider and the MC – both online and onsite. It can be carried out by the provider itself but also by an independent assessor and through online/automated assessment.

Microcredentials in Ireland do not universally specify all the components one might expect to encounter in a qualification or module of a qualification related to those found on the Irish Register of Qualifications. The most common elements as reported in the VET provider survey are the title, the holder, the awarding body and the date of issue ([19]). Other elements that are included but not in all MCs are: learning outcomes, results of the assessment and expression of the workload in credits or duration. Less common still are the purpose and scope of learning activities, the link to standards, the prerequisites for participating in learning activities (e.g. work experience), the duration of validity and the relationship to existing qualifications. Similarly, there is variation in the quality assurance of MCs, with both external and internal methods based on transparent quality standards in use.

In terms of the combination and accumulation possibilities, surveys and interviews highlight again that MCs are highly varied: they may be added to an

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(19) The sample size is small, so care needs to be exercised but the pattern reported here is similar to the findings for the entire pan-EU survey.

individual account or portfolio, recognise prior knowledge, skills and competences and learning, as well as being combined into a full qualification or larger credential and counting as part of someone's education and training programme. The VET provider survey indicates that combination and accumulation of MCs with other qualifications and credentials from the same provider or from another organisation is commonplace. The VET provider survey also shows that it is common for MCs to be referenced to and/or integrated into the national qualifications system and for MCs to be linked to the credit system.

2.8. Are there any sectors / occupations where microcredentials are prevalent, relevant and important? Please provide a detailed overview of the use of microcredentials in the sector / occupation.

2.8.1. Education Sector: teachers' professional development

As noted above, the National Forum for the Enhancement of Teaching and Learning in Higher Education, which develops and provides training for anyone involved in teaching at third level ([20]) has played an important role in developing microcredentials within the education system by developing a specific microcredential system for the professional development of teachers in higher education which is also open to staff in FET ([21]).

The system, which was launched in 2018, comprises a range of 23 courses ([22]) each of which has been designed to require a maximum of 25 learner effort hours and four criteria (or learning outcomes), which roughly equates to around six weeks of online learning. Courses can be taken in one of three modes: face-to-face blended, self-study and online facilitated, although only 5 are currently available as self-study. Courses are run twice a year, so only self-study courses can be taken at any time. Since the onset of the pandemic there has been a pivot towards online learning (though it is anticipated that, when the situation eases, there may be a rebalancing towards face-to-face – people now have the

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(20) For more information see: https://www.teachingandlearning.ie/

(21) The following sections are based on interview material and also Donnelly, R. & Maguire T (2018) Badges for recognizing Professional Development. NF Insights. National Forum for the Enhancement of Teaching and Learning in Higher Education (2018). https://arrow.tudublin.ie/ltcart/68/

(22) As of 25th October 2021: https://opencourses.ie/courses/

experience to weigh up which elements of courses benefit from face-to-face and online respectively). Where self-study is available, it has proved to be the least popular. As well as the courses and badges, related Open Educational Resources are also available via the Open Courses website. Peer learning and assessment are key aspects: a 'peer-supported learning triad' model is used in which course participants work together and also assess one another's work: evidence for assessment is gathered in a PD portfolio and shared in the peer triad, there is no external assessment. The courses are not levelled against the NFQ, but they have been designed to provide an introduction to the subject concerned. There are around 60-70 participants each time a course is run. Courses are supported by facilitators, two to three for 30-70 participants. On course completion, participants can earn an 'open badge' which they can then save to a certified hosting tool (it is up to the learner to use whichever platform they wish) ([23]). Individual institutions can embed courses within their own teacher education programmes (typically post-graduate diplomas or MAs). Any institution can deliver any of the courses, and can offer participants recognition by claiming the linked digital badge.

Facilitators for the courses are developed from within the courses themselves. After six weeks of online learning, a participant can opt to do a further two weeks' training to be a facilitator (for which they earn a badge). Around 75% of learners choose to do this. Interestingly, a significant number of people who earned the badge did not thereafter do anything with it, so to stimulate people into using it the 'facilitator ambassador' role was introduced.

There is a need to strengthen and widen recognition processes. The courses are 'non-accredited', meaning that they are not accredited automatically by any institution, so any institution would need to accredit them individually. However, a PD recognition framework is going to be published for consultation soon by the National Forum. Stackability was an original intention for the courses and there may be a further phase of funding in which this issue will be considered. There are no formal pathways as such amongst the courses, but they are clustered, and facilitators can support learners in making decisions about which course to do next.

The context in which the courses were developed is informative. They emerged as a way of improving professional development (PD) opportunities for teachers in a context where there are no specific requirements for PD for teachers in higher education and there are no mandatory requirements for teachers to hold teaching qualifications. The courses are linked directly to the National Professional Development Framework which was launched in 2016 to support the professional development of those who teach across the sector by setting out core values and

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(23) For more information see: https://opencourses.ie/about-open-badges/

providing a structured outline of professional development activities for teaching and learning. In 2015 the National Forum conducted a mapping and review of non-accredited PD opportunities and determined that there was scope to develop a set of short courses that would have broad appeal in a context of a wide range in practice and fragmentation of opportunities and which could improve recognition: 'as these open-access professional development programmes have been developed at a national level, they support staff mobility and transfer across the Irish higher education sector.' (Donnelly and Maguire, 2018).

In 2017 it launched a project that brought together institutes of technology, universities, and private sector institutions to develop 15 short courses (selected after consultation, which identified the most popular courses). Each course was developed by a team of 3-8 academics and all courses were subject to a peer review process involving reviewers from across the sector who offered their advice both on the content and delivery strategy for the badge. Programme design teams were given flexibility in relation to the format and structure of the delivery of their particular programme. However, all programmes share the following components:

(a) available as open-access professional development programmes;
(b) four key criteria that will be met by completing the badge;
(c) clearly identified artefacts that are to be considered as evidence;
(d) a short promotional video outlining the focus of the professional development programme;
(e) a workshop package of programme content and activities that would enable any institution to deliver the professional development programme;
(f) links to useful websites and resources;
(g) requires each participant to provide evidence of meeting the key criteria to claim a digital badge which is then issued through the National Forum.

In order to build capability to deliver the courses across the sector, development teams ran facilitator-development workshops in selected academic institutions.

There were some initial misconceptions about microcredentials and the meaning of 'digital badge'. Course developers had heard of the term but tended to produce too much material at first, and had to learn how to condense material into the required MC format. It was a deliberate decision to distinguish clearly between the courses and badges on the website to avoid confusion amongst participants.

The courses have been popular and successful, with demand for new courses, e.g. sustainability education, and with the 10-week course on 'Universal Design of Learning' developing into a MOOC to satisfy demand (it now has 700-800 participants).

Key success factors include ([24]):

(a) direct linkage to the National Professional Development Framework: badges are colour-coded in line with the Framework;

(b) strong ownership within the sector amongst teachers, which provides the guarantee of quality and supports trust in the digital badges. The system was developed by and for the sector;

(c) having digital learning experts on board: an instructional designer and a learning technologist were funded to support design and delivery of the courses.

2.8.2.   Information and Communications Technology Sector

ICT is an important sector in Ireland, with a significant presence by nine of the top 10 global software companies and nine of the top 10 US technology companies: Apple has been based in Cork since 1980, Microsoft has its European headquarters in Dublin, and there are clusters of tech activity throughout the country ([25]). In this context, the development of digital skills has been a particular priority for successive governments.

Microcredentials, in the form of vendor certifications have an important role to play in entry to and progress within occupations within the sector. ICT is a global industry dominated by very large multi-national enterprises, which had to set their own global standards as they developed, and which have had to constantly update the standards for skills as their products and services have undergone (and continue to undergo) rapid development. In these circumstances, national arrangements for skills development and national qualifications systems have been far less relevant for meeting their skills needs than in many other sectors.

In Ireland, vendor certifications form a key component of the offer of ICT qualifications through public provision (see one example in the box below, although there are many other examples, such as the Tipperary ETB's Microsoft Traineeship) ([26]), and they are also available through private providers, as described below. Ireland provides a good opportunity to look in depth at the nature of microcredentials in the ICT sector, including the relationships involved in their provision. This sheds light on the roles of local, national and global stakeholders and the complexity of the relationships involved.

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(24) Identified through interview.

(25) For more information see: https://enterprise.gov.ie/en/What-We-Do/Workplace-and-Skills/Skills-for-Enterprise/Attracting-Tech-Talent-to-Ireland/

(26) For more information see: https://www.limerickpost.ie/2020/10/09/tipperary-education-and-training-board-launches-microsoft-traineeship/

Box 2. An example of the role of microcredentials for the ICT sector in public provision

Kerry College of FET offers a full-time, post-school Leaving Certificate, IT Support Technician programme. Of 53 weeks' duration, the programme offers accreditations from CompTIA as well as Microsoft for those who wish to work in a range of IT support roles in core hardware, operating systems, networks and cloud computing. The programme also enables progression to Progression to Year 2 of the Higher Certificate in Computer Systems. The programme bundles together a number of different certifications, which individually might be considered to be MCs:

CompTIA A+ 1 (A+ 220-1001) – core series
CompTIA A+2 (A+ 220-1002) – core series
CompTIA Network+ (Network+ N10-007)
Microsoft Windows Server (MTA 98-365)
Microsoft 365 Fundamentals (MS-900), which comprises 6 digital badges
Microsoft Security (MTA 98-367).

To give an indication of size, MS 365 Fundamentals takes at least 150 hours of instruction, i.e. around 25 hours per badge.

Source: prepared by an author.

As noted above, there is a national certification agreement for the provision of industry-recognised examinations and certifications related to digital skills with Certiport (a Pearson VUE business) on behalf of the FET sector, with Microsoft (MS) and Adobe certifications being the most commonly issued. However, it is important to note that the credentials can be obtained in a wide variety of ways, e.g. direct from MS (online or paid-for instructor-led) [27] or through a variety of global and national partners.

Regarding MS credentials, the rationale for MCs from Microsoft's perspective is that they are a way of supporting the MS 'ecosystem' or its partners and users by 'advancing the skills related to their products' [28]. There has been increasing interest amongst vendors like MS in the last decade or so in having a skills programme as it helps to develop the 'pipeline of talent' for people to use vendors' products, whilst there is also an element of corporate social responsibility in helping to develop digital skills in general (the two motivations coincide on this occasion).

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(27) For more information see: https://docs.microsoft.com/en-us/learn/certifications/microsoft-365-fundamentals/?tab=tab-learning-paths

(28) Interviewee

MS certificates range from school level (e.g. Coding in Minecraft) to high-level industry certifications (e.g. Azure Solutions Architect Expert) ([29]). The size of the certificate varies, e.g. the Excel certificate may take 20 guided learning hours (though the actual amount of time depends on the learner's prior experience). Globally Ireland awards a large number of MS certifications every year ([30]), probably reflecting the importance of the sector in the country.

MS has developed its 'stack' or pyramid of certifications for technical roles over time. Up until 2019 its certificates had been based solely around its products but in that year it added certifications based around careers, marking a shift in focus from product knowledge to a skills-based approach based on specific job roles. This appears to have been a significant step forward not just for Microsoft but for skills development and certification in the IT sector in general. Writing at the time, one commentator noted:

'When it comes to getting a job or meeting standards within an IT organization, certifications have become a staple. But as mainstream as certifications are, no certification can completely prepare you for a career. Though you gain valuable and transferable skills while preparing for certifications, IT certifications show your knowledge of a product, not your competence as an employee. But employers act as if they do. For better or worse, employers have outsourced their employees' career progression to IT vendors. In some views, it's problematic seeking generic outside counsel to determine what their employees should know … what you get with a certification is a generic knowledge of a product that's unspecific to your job needs. We've allowed IT vendors (with the use of certifications) to define what employees should know instead of taking the initiative to do it ourselves. And this has led to a gap between the knowledge gained from certification preparation and the knowledge required to perform job tasks. Microsoft acknowledged this gap, did some research and announced their role-based certifications. These certifications won't just show product knowledge; they'll show employers and peers you're prepared for a career. (…) This marks one of the first steps in the IT certification industry toward career-based knowledge. This announcement from one of the world's largest IT vendors could be the kindling needed to blaze a new certification trail — one no longer focused on generic overviews of technologies but on the skills and tasks needed by most professionals.' (Aucoin, 2019).

In terms of accumulation, 'stackability', and progression, Microsoft's offer is now structured into three levels: the Fundamentals level is an entry-level certification covering basic concepts; Associate level providers a more technical

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(29) Azure is Microsoft's public cloud computing platform.

(30) Interviewee

mid-level certificate; whilst Expert level is aimed at experienced professionals. It offers a variety of what it terms 'certification paths' ([31]). The first certification is not a prerequisite for the mid-level certificate, but a mid-level badge is required to access the highest certification. The lowest level does not require any prior experience of technology and there are no entry requirements. Associate level on the Microsoft pathway was described by an interviewee as being 'perfectly pitched at the sweet spot for VET' as it provides a way of gaining entry to technical roles and has been an important currency in this area of the labour market for a while.

MS certifications illustrate well how the delivery of global microcredentials involves more organisations and increases the complexity of the landscape compared to 'traditional' provision. In general, the credentials can be obtained in a wide variety of ways, e.g. direct from MS (online or paid-for instructor-led) ([32]) or through a variety of global and national partners. MS contracts with Certiport (owned by Pearson VUE) to provide its certifications around the globe. Certiport delivers over three million tests each year in secondary, post-secondary, workforce, and corporate technology markets including MS. The certificates take the form of digital badges which are hosted on the Credly platform with whom Pearson works in partnership (see also section 2.3 on the Credly platform). In Ireland, Prodigy Learning holds the exclusive rights to sell the industry certificates covered by Certiport (Adobe Certified Associate (ACA), Autodesk Certified User (ACU), IC3 Digital Literacy (IC3), Microsoft Office Specialist (MOS), and Microsoft Technology Associate (MTA) training and certification programmes) and in 2016 received Certiport's 'Global Partner of the Year' award ([33]). Prodigy Learning delivers the national certification agreement between SOLAS and Certiport and works closely with providers to get the certificates recognised and embedded in programmes.

The figure below provides an indication of the network of organisations involved and their relationships. Prodigy Learning sells licences to ETBs to run the certification programmes and provides dedicated support to ETBs to understand how the certificates can fit into the curriculum. It also confers ETBs and schools/colleges with 'Centre of Excellence' awards which recognise excellent standards in terms of both the numbers of exams being taken (quantity) and the number of successes (quality), which benefits ETBs through recognition of educators' achievements in front of peers. The relationship with SOLAS and the

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(31) For more information see: https://docs.microsoft.com/en-us/learn/certifications/

(32) For more information see: https://docs.microsoft.com/en-us/learn/certifications/microsoft-365-fundamentals/?tab=tab-learning-paths

(33) For more information see: https://certiport.pearsonvue.com/About/Press-room/Press-releases/2016/Certiport-Recognizes-Prodigy-Learning-with-Global.aspx

ETBs was described by an interviewee as unique and comes from Prodigy Learning being 20 years in the market.

Figure 1. Indicative illustration of organisations and key relationships involved in Microsoft vendor certificates in Ireland
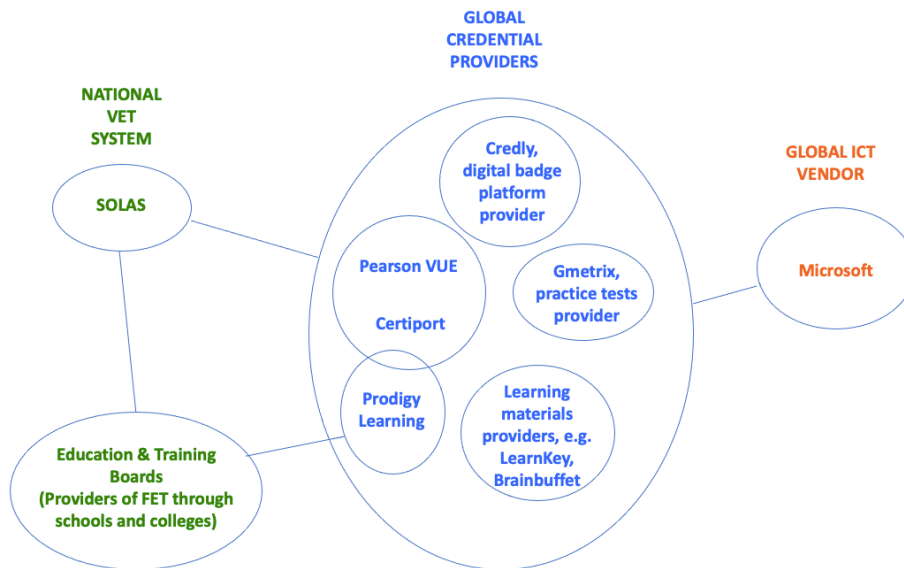
Source: prepared by an author.

Interestingly, there are many private sector actors in the learning materials space ([34]). Although MS provides its own learning materials, there are many other providers also offering materials and courses, e.g. LearnKey ([35]) and Brainbuffet ([36]). Practice tests are provided by another actor, GMetrix (US company), which provides online testing and associated learning materials ([37]). After initial developing the practice tests for MS Office certifications, it has developed a suite of practice tools in partnership with other providers. Practice tests and final exam are fixed by MS and Certiport.

Interviewees indicated that the advantage of vendor certificates for providers is that they offer access to a consistent offering and independent verification through a computer-based course and have therefore been attractive to providers.

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(34) For more information see: https://www.prodigylearning.com/learning-products/

(35) For more information see: https://www.learnkey.com/index

(36) For more information see: https://brainbuffet.com/about/

(37) For more information see: https://www.gmetrix.com/Home/About

Excellence, proof and consistency are key to the success and popularity of the certifications. They also offer solutions for providers which are (i) comparatively low cost (compared to the potentially high costs of setting up courses themselves); (ii) avoid providers having to develop relevant expertise (they may not be equipped to provide certain courses); and (iii) from a national perspective are efficient to the extent that they avoid providers reinventing the wheel. The arrangement in Ireland of having a national certification agreement is also beneficial for providers since it facilitates access to the credentials and avoids individual providers having to negotiate their own agreements.

For learners the arrangements in Ireland are also beneficial. For example, it provides easy access to the credentials and the access is government-backed, as well as being supported by ETB who together, in effect, provide a form of guarantee as to the credibility and value of the microcredentials. In the initial phase of education, moreover, the programmes leading to the microcredentials are free. Its constituent certifications can also be taken individually through other authorised providers, including private providers. One authorised CompTIA provider offers the CompTIA certifications listed in the box above about the Kerry Colleges programme as 5-day courses at a cost of between EUR 2 475 and 2 995 each ([38]). This price gives some indication of the value of the 'market' value of these microcredentials in the ICT labour market.

Interviewees also highlighted that there are benefits for employers who need their staff to be equipped to use MS products as they do not want to have to work out what it might mean for them that a qualification is at a certain level on the NFQ or what skills someone has actually acquired during a programme. As one interviewee commented: 'Industry-driven proof demystifies all this for the employer'.

In short, Ireland's arrangement in relation to vendor certificates related to the ICT sector seems to deliver access to industry standard credentials in a way that simplifies procedures for learners, providers and employers, whilst also providing a form of guarantee as to their value as currency to enter employment and progress in a career.

Regarding the relationship of vendor certificates to qualification systems for the ICT sector, according to interviewees, globally, integration of such certificates into qualification systems would improve quality and currency but would be a challenge. Indeed, amongst employers disinterest may be an obstacle. As one interviewee commented, employers 'don't care if a vendor qualification is on a

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(38) For more information see: https://www.nhireland.ie/courses/technical/comptia

qualification framework' ([39]). Clearer and easier pathways (processes) are needed for getting MCs recognised in qualification systems, which do not entail lots of work by providers, vendors or employers. The goal should be 'teach once, award twice', i.e. the learner does a single course which leads to both a vendor qualification and (contributes to) a national qualification.

(39) Interviewee

CHAPTER 3. Analysis of microcredentials and evolving qualifications systems

This chapter examines how MCs relate to the Irish qualifications system and especially the National Framework of Qualifications (NFQ). As noted in section 1, from the perspective of the qualifications system, microcredentials can be seen as 'old wine in old bottles but with new "labels" or outer packaging': the existing system is quite able to cope with the rise in popularity of microcredentials. That said, as this section shows, some adjustments to existing processes are required and these are in the process of being made.

3.1. How are microcredentials linked to and/or integrated into qualifications system? How do they operate outside national qualifications system?

From the perspective of the qualifications system, the MC label is new but nothing else about them is new in an Irish context. QQI has been validating small volume courses and certifying the resulting learning with formal qualifications that are included in the NFQ for many years. The NFQ was established in 2003 and from the outset provided for minor, special-purpose and supplemental qualification types. Each type can be used to certify small volumes of learning. Indeed, such learning 'has enabled vast numbers of learners to achieve full qualifications over time' [40]. In short, the advent of MCs is not seen as problematic since they can be accommodated within the National Framework of Qualifications (NFQ).

The set of qualification classes that are included in the NFQ, which is maintained by the QQI, comprises Major, Professional, Minor, Special Purpose and Supplemental Awards. QQI's descriptions of the latter three Awards is as follows [41]:

(a) minor award-types provide recognition for learners who achieve a range of learning outcomes, but not the specific combination of learning outcomes required for a major award. Minor award-types are always linked to major award-types. These awards will always be smaller in volume than the major award of which they are a part. Awarding bodies may develop their own

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[40] Comment by a participant at the Cedefop Conference on Microcredentials, November 2021.

[41] QQI (undated) Descriptors for Minor, Special Purpose and Supplemental Award-Types.

approaches about what is the smallest part of a major award that is to be recognised as being a minor award;

(b) special-purpose award-types are made for specific, relatively narrow, purposes and they are standalone. There is no requirement that they be linked to a major award, and they will always be significantly smaller in volume than a major award. A special purpose award may also relate to more limited strands of learning outcomes than a major award. It is possible that a special purpose award could, for example, focus on discrete skills (concentrating on the skill strands of learning outcomes) only. A special purpose award will always be significantly smaller in volume than a major award;

(c) supplemental award-types always build upon a previous award. They could, for example, relate to updating and refreshing knowledge or skills, or to continuing professional development.

In FET QQI operates a credit accumulation system called the common awards system. The system comprises compound and component awards. Compound awards may be achieved by accumulating component awards. Component awards most frequently require 150 hours of learner effort, but the volume can be as little as 5 hours. Compound awards can be major, special-purpose or supplemental.

Indeed, Major Awards may simply state that, outside the core elements, a certain credit value may be achieved from 'relevant' components (e.g. Hotel Front Office Major Award 4M2015) [42] without specifying what those might be, which gives providers considerable scope to adjust provision to local needs, teaching expertise, equipment and materials etc.

In 2020, a Green Paper (QQI, 2020b) and its accompanying Technical Paper on the overall qualifications system (QQI, 2020b), went into further detail as to the role of MCs in the context of the current awards classification:

'Micro credentials (a topic du jour) are qualifications for small volumes of learning in contrast to macrocredentials (such as honours bachelor's degrees). The NFQ's minor, special purpose and supplemental award-types are examples of prototype microcredentials and perhaps meso-credentials, though microcredentials can be smaller than the smallest QQI minor awards. There is undoubtedly a necessity for people to be able to complete selected parts of larger programmes that may be of interest; for example, a person with a computer science degree may, a few years after graduation, be interested in a module introducing some new software technology. Arguably the educational process (and associated learning) is more important than the credential, but a micro credential (e.g. minor award) is a useful way of formally recording the achievement and it may add weight to a CV. Digital

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[42] For more information see: https://qsearch.qqi.ie/WebPart/AwardDetails?awardCode=4M2015

badges can help make microcredentials more valuable and therefore more attractive.' (p. 102).

There is no desire to try to bring all MCs into the NFQ as the workload would be enormous, and the system would become bogged down in paperwork. Microcredentials can be very small and there is a cost and administrative overhead associated with including a qualification in the NFQ, so the benefit of inclusion may not always warrant the cost for very small MCs with very little uptake. Hence, at present, there is what we could call a 'mixed economy' approach to MCs, as there is to qualifications as a whole: some will be in the NFQ and some will sit outside it. The NFQ is used according to need, a question of 'horses for courses.' ([43])

Where adjustments are required to enable the existing qualifications system to better accommodate microcredentials, these are being made. For example, a scheme was piloted in 2020 to streamline the process for validating microcredentials in QQI-validated programmes in Higher Education and Training (It should be noted that such programmes account for only a small fraction of the 'awards' or qualifications in Higher Education and Training, with the vast majority of programmes being provided by self-validating bodies.) QQI has a unified validation process and criteria for FET and the QQI-validated programmes in HE and, in summer 2020, undertook a pilot scheme to streamline the validation process for microcredentials. With the cooperation of private higher education and training providers, a process was developed whereby providers could submit standalone programmes of between five and 30 ECTS (see below for more information on credits), which lead to QQI special purpose awards. Streamlining involves reducing the time to approval from 26 to 15 weeks and using smaller approval panels (of two to four people rather than five). Of the 10 original programmes submitted for validation in the pilot in October 2020, nine have either been validated or recommended for validation. All these programmes comprised single modules drawn from previously validated programmes of larger volume and ranged in size from 5 to 20 ECTS (QQI, 2021). Private providers have also requested that the streamlined model for microcredentials be extended further to include new programmes (i.e., ones with no connection to a previously validated programme) and the modification of modules which had been taken from a previously validated programme(s) (QQI, 2021).

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(43) Interviewee

3.2. How are microcredentials linked to credit systems?

There are two credit systems in Ireland, one for FET (e.g. the one used in the Common Award System) and the other for HE. In CAS at NFQ Levels five and six (EQF four and five) in particular the norm for Minor and Special Purpose Awards is 15 credits and the minimum is five with one credit equalling 10 hours (effort) (QQI, 2014). In HE the credit system has been developing in line with the ECTS as outlined below.

As noted, there is much flexibility in the qualifications system, including around the credit systems. To illustrate this flexibility, the following examples are provided:

(a) major award in Computer Systems and Networks (NFQ Level five, EQF Level four, 5M0536). Note that how the Award is structured will vary across programmes, this is just an example. To obtain this Major Award learners have to achieve three core Minor Awards and then a range of optional Minor Award components. Learners have to achieve 120 credits by completing: the three core Minor Awards worth 45 credits; at least 15 credits from three options related to maths and computation (15 credits each, except "Maths for STEM" worth 30 credits); at least 15 from Work Experience or Work Practice (15 credits each); at least 15 credits from four options related to transversal competences e.g. teamworking, communication (15 credits each); at least 15 from Work Experience or Work Practice (15 credits each); and at least 30 credits from 5 job-specific options worth 15 credits each e.g. mobile technologies (unless "Maths for STEM" has been taken under the maths and computation group of Minor Awards.)

(b) to give an example of a Special Purpose Award, CNC Machine Setting and Operations (NFQ Level five, EQF Level four, 5S2853) has a credit value of 30. To achieve the award, two Minor Awards must be completed worth 15 credits each–CNC Milling Setting and operations (5N2850), and CNC Turning Setting and operations (5N2851).

As noted, in FET the minimum size for an award is 5 credits. This is important in relation to MCs, many of which would be smaller than this. Further, as one interviewee noted, many employers' preference is for microcredentials of one to two credits. In April 2020 a technical paper on the qualifications system (QQI, 2020b) noted:

'Microcredentials are similar to minor awards (minor awards can be regarded as microcredentials) but can be significantly smaller in volume and 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.' (p. 42)

It also noted that qualifications not yet included in the NFQ include 'Micro (bite-sized) credentials that are significantly smaller in volume than the smallest minor awards'.

At the level of MC smaller than five credits, we tend to be in the realm of digital badges. Interestingly, these are seen as having two useful functions (i) they enable people to secure a form of recognition for small pieces of learning and there is clearly a place for them in the market for learning (ii) they can attract people in to learning (they might be the bottom rung in a learning ladder which starts with digital badges with some basic assessment, e.g. via a multiple choice test, through badges with more rigorous assessment on into minor or special purpose awards and then major awards.)([44]).

In higher education, the system has been developing in line with the ECTS, assigning credit to major award types such that one credit ranges between 20 and 25 or 30 hours (effort) (National Qualifications Authority of Ireland, 2006) QQI has indicated that five ECTS is thought to be the minimum practicable volume for NFQ inclusion (in higher education).

3.3. Can microcredentials be accumulated and combined with other qualifications?

Since Minor and Special Purpose are considered to be MCs, processes for the accumulation and combination of MCs can be considered to be the same as for Minor and Special Purpose Awards. Some Minor Awards in the Common Awards System (FET), especially generic ones like Work Experience or Work Practice and those related to transversal skills like Teamwork, are used in a wide variety of qualifications.

Below five credits, MCs are not yet included in the NFQ but as noted, they have the potential to be aggregated and used in RPL to gain exemptions. As noted above, learners holding certain Microsoft credentials can get exemptions from parts of certain QQI awards.

Digital badges of fewer than five credits that are available in the 'open market' may often be free-standing (and again the Irish system is predisposed to the notion of free-standing qualifications by having Special Purpose Awards as an integral component). Regarding the issue of 'stackability', it is suggested that this term is not well defined, and transferability is seen as a more understood term from the

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(44) Interviewee

perspective of the qualifications authority. Another interviewee commented that 'serious players' in the MC market will likely make sure their badges are 'stackable' ([45]) (it is axiomatic that making digital badges transferable in this way is in the self-interest of learning providers operating in the commercial market to maximise cost-benefits to learners and the potential to provide or sell further courses.)

As noted above, a pioneer of digital badges in Ireland has been the National Forum for the Enhancement of Teaching and Learning in Higher Education which is using badges as add-ons in HE teacher education for teachers who are already qualified (holding major awards). This is interesting as it gives credibility to the concept of digital badges if teachers themselves see value in them and have no difficulty with their use.

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(45) Interviewee

CHAPTER 4.   Analysis of microcredentials and the added value for end users

4.1.   Is there a need for microcredentials? Why do different stakeholders need microcredentials?

As noted, nationally the need for MCs has been clearly articulated in recent policies in terms of being a key tool to enable the country to address the need for greater flexibility in work-related learning at a time of major changes in labour demand. The current FET strategy identifies modular and micro learning opportunities as being able to 'meet specific upskilling needs' and use of 'digital badges and microcredentialing' as 'support(ing) a practical focus in learning' (p. 33), in the context of a FET system which has long used MCs extensively in all but name.

Both interviews and surveys show that MCs meet important needs and there was a clear consensus that these needs are growing. The most common identified in the surveys were to upskill and reskill the workforce and to better respond to changing labour market needs. Such needs were consistently identified as key across different stakeholder groups. VET providers also identified the following as being important needs: to encourage lifelong learning and to tailor education and training better to individual needs and make it more learner centred. Less commonly mentioned ([46]) needs across all stakeholders were: to provide access to a greater diversity of learners, to meet skill needs in economic sectors where qualifications are not yet formalised, to address structural unemployment and to sustain labour market reforms (sometimes the latter two were not cited at all by some survey respondents).

There is other evidence from the labour market of increasing interest in and need for microcredentials, with a number of reports and surveys being commissioned on the topic (as mentioned elsewhere in this report). Perhaps most notable amongst these is the report funded by Skillnet Ireland that sets out a 'roadmap' for microcredentials development (Nic Giolla Mhichíl et al., 2020). Skillnet Ireland is an agency funded by the government to support the competitiveness, productivity and innovation of Irish businesses by enabling increased participation in 'enterprise training and workforce learning'; it currently supports over 21 000 businesses and provide learning experiences to over 81 000

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(46) Although care has to be taken in light of the small sample size.

trainees ([47]). The roadmap report identifies microcredentials as 'a critical component in deploying the learning programmes of the future' (Nic Giolla Mhichíl et al., 2020) and states:

'Microcredentials provide a unique mechanism by which Ireland can recognise and develop the work-based learning of employees to support both reskilling and upskilling as well as lifelong learning. Skillnet Ireland networks and their constituent member organisations are well positioned as key actors in the microcredential eco-system to influence and drive the roll-out and development of national mechanisms to support a microcredential approach to industry-focused applied learning. In order to meet the challenges involved in successfully implementing a robust and accelerated process to validate industry-based learning, a holistic system-wide perspective will be required.' (Nic Giolla Mhichíl et al., 2020).

To achieve this, the report proposes a multi-stakeholder approach with engagement from national agencies, industry, education and training providers, and employer and employee skill development networks. Specifically, it proposes a range of measures including: raising awareness and understanding of microcredentials through national dialogue; funding collaborative developments involving industry, professional and employee bodies, training and higher education providers; aligning microcredentials with national and international definitions, standards and frameworks to ensure their currency and wider recognition; creating a national strategy that positions Ireland as an 'international hub of excellence and delivery' of microcredentials; mapping current workforce development to identify where microcredentials might support 'more agile, flexible and stackable' provision; and funding the piloting of models in which educational providers and Skillnet networks and employers 'co-design, co-develop and co-deliver' microcredentials to gather evidence on the benefits for all stakeholders (Nic Giolla Mhichíl et al., 2020).

Further evidence of the need for microcredentials is provided by the popularity of credentials like those offered by Microsoft and Adobe etc., which are also available as part of publicly funded programmes.

4.2. What are the main benefits / added value of microcredentials for end users (e.g. learners, education and training providers and employers)?

([47]) For more information see: https://www.skillnetireland.ie/about/

What value do microcredentials bring to the overall qualifications system?

From the interviews and surveys there is a consensus that MCs bring a number of benefits to end-users. Chief amongst these is that they enable a flexible response to skill needs, thus helping to 'lubricate the wheels' of the labour market [48]. MCs are seen as being highly relevant to labour market needs and assist employers who need quite specific skill sets amongst their (potential) employees. For learners MCs can also be motivating. Their short duration and low cost is attractive to both learners and employers alike and the flexibility in their mode of delivery (often being available online) enables them to be fitted in around work and domestic commitments. The portability of MCs is also attractive to learners and is supportive of lifelong learning. MCs can also enable recognition of prior learning or skills acquired, which both learners and employers see as motivating; for employers in a tight labour market, it can be seen as a 'valuable proposition' to offer staff or potential recruits (access to) MCs, especially in sectors, e.g. hospitality, where levels of skill accreditation are low [49]. All of these features make MCs attractive to VET providers since they enable them to improve their offer to employers and individuals.

From the point of view of the state agency responsible for managing publicly funded FET programmes (SOLAS), microcredentials are seen as having a vital role to play in trying to open up the system to everyone, rather than it being seen as an alternative pathway. For example, the promotion of microcredentials to higher education graduates will bring them into the system and therefore improve perceptions of it, helping to address the parity of esteem issue [50].

In the past, the emphasis has been on the provision of training for the unemployed. Now the emphasis is on employed people, although within that category certain groups will be prioritised through funding, e.g. older workers. One million people in Ireland have less than a level five qualification and are highly vulnerable to disruption because of industrial change and flexible, accredited learning involving micro credentials are seen as part of the solution to their upskilling and reskilling.

SOLAS, through the Innovation Fund, do not want to create MCs outside the mainstream as this wouldn't be serving people well or adding sufficient value. A SOLAS interviewee believed that it would be better for micro credentials to be called microqualifications, otherwise they might not be seen as having the same

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(48) Interviewee
(49) Interviewee
(50) Interviewee

value as qualifications are commonly understood. It is also important that there is coherence across microcredentials. One interviewee had interviewed someone once (in the education sector) who had more than 100 badges on their CVs but they were not connected up.

In the higher education sector, the view previously had been that MCs as add-ons were fine if someone had a full qualification already. But the focus of policy is to deal with people without qualifications, so a different approach is needed in which MCs are bound into the formal public validation system. The most important question is: how do we value micro learning? The technicalities of microcredentials should follow on from this question, rather than leading the issue.

Needs must be at the centre of attempts to develop MCs for SOLAS and so, in the Innovation Fund projects, whilst MCs will be small there will not be a rigid application of any size parameters, whilst ensuring they can be included within the NFQ. The key thing is that MCs developed in the Innovation Fund are defined by the world of work. Since MCs are not defined officially, possibilities for a 'user-centric' approach are opened up, where the users are individuals, employers and the FET system.

Regarding employers, microcredentials offer a solution to long-standing issues related to employers' reluctance to be involved in training. Small pieces of learning are attractive to employers (they are not expensive, relatively easy to accommodate in the workplace etc.), and five credits is big enough to include the underpinning knowledge the staff need, whilst also giving staff access to a 'proper' qualification. Through the Innovation Fund projects, SOLAS has 'discovered the parts that really matter [to employers] and want to build qualifications out of them' ([51]). MCs also provide a mechanism for dialogue with employers who don't always fully understand the knowledge, skills and competences that people need in the workplace.

The approach adopted in the Innovation Fund is to make sure that micro credentials are part of wider packages related to industry needs, and this approach will be key to MC success. It is important to consider the pedagogical side, i.e. when and how learning will be taught/acquired including in the workplace. A key challenge is to achieve authentic collaboration, a genuine meeting of minds between the public and private sectors. The thinking amongst providers and employers about badging and microcredentials was described by one interviewee as having been 'fuzzy' and so some national leadership has been and is required. The second Innovation Fund call in July 2021 contained criteria on microcredentials.

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(51) Interviewee

4.3. Are microcredentials trusted among different stakeholders? What are the main reasons for trust / distrust in microcredentials? What are the conditions for ensuring the trust in microcredentials?

Evidence from the interviews and surveys indicates that levels of trust in MCs vary significantly from respondent to respondent; but this is probably not surprising in view of the large variation in the nature of MCs themselves (described above). The reasons for distrust are also wide-ranging and there is not a particular single factor that explains most distrust. The reasons include: the lack of agreed QA standards and definitions and associated uncertainty about MC quality; uncertainties amongst employers that individuals actually possess the skills that MCs signal and associated lack of transparency in how learning outcomes and assessment are documented; lack of knowledge of MCs; confusion around the names used for short learning experiences; lack of recognition of some MCs and incompatibility with the national qualifications system; and limited opportunities for accumulation and combination.

The Skillnet-funded roadmap report notes that microcredentials need to be an 'attractive proposition to employers and employees' and they will have value by being built on 'a clear definition, recognised standards, and the reflection of both national and global trends' (Nic Giolla Mhichíl et al., 2020). It also argues that conceptual clarity as to what exactly microcredentials are critical and that at present a common understanding of their value, supported by identified standards that are accepted across a range of industry, educational and professional bodies is lacking. It argues that ad hoc, individualised, industry-developed, sectoral and fragmented forms of credentialing, with no clear relation to alternative, perhaps competing recognition frameworks, should be avoided; they cloud the perception of the value of microcredentials, and employers and employees are unclear as to where they sit alongside awards validated by recognized bodies. From the employer perspective, microcredentials present a potential solution to training validation needs but organisations must have clearly defined goals as to why they make strategic, operational and developmental sense in their context (Nic Giolla Mhichíl et al., 2020).

The report also notes that there will need to be an inclusive approach which reflects the diverse stakeholders inherently involved in the provision of microcredentials and uses the differing values and emphases of different groups to ensure broad buy-in from relevant bodies and individuals. In this context, it recognises the tensions inherent in providing standardised, national frameworks

and the need for 'iterative, inductive and small-scale case studies, as a means of assessing and iterating on the quality of provision' (Nic Giolla Mhichíl et al., 2020).

CHAPTER 5. Conclusions

MCs are widely used in Ireland in labour market related education and training, and have been for many years. The qualifications system already includes qualifications as small as five credits (Minor Awards) and is open to free-standing qualifications through its category of Special Purpose Awards. Microcredentials of fewer than five credits can already be aggregated and potentially used in RPL processes to gain exemptions from parts of, and advanced entry to, programmes leading to qualifications in the NFQ.

Microcredentials are used mainly by adults, although they are also available as part of some full IVET qualifications. Recent developments in policy and the labour market means that there has been a surge in interest in microcredentials, which are widely perceived as having a valuable (potential) role to play in upskilling and reskilling and responding promptly to rapid changes in specific skill needs, and perhaps somewhat less commonly in skills recognition, supporting lifelong learning and opening up learning to a more learners.

A corollary of this widespread use is significant variation in the characteristics of MCs, which do not conform to a standard pattern. There is a highly diverse mixed economy of provision with partnerships being commonplace involving public and private providers, employers' organisations as well as big technology companies.

There is also much variation in the key elements of MCs, including the QA processes and standards applied, the assessment methods used and the possibilities for combination and accumulation. This makes it difficult for learners and employers to have confidence in all microcredentials available in the learning 'marketplace', whilst some microcredentials have the status of currency in some occupational and sectoral labour markets, e.g. around ICT. Perhaps unsurprisingly in this context, there are widespread variations in levels of trust – probably related to the wide variation in MCs themselves. Addressing these issues would require greater transparency around microcredentials, especially in respect of quality standards.

List of abbreviations

CAS	Common Awards System
C&G	City & Guilds
CVET	Continuing Vocational Education and Training
ETB	Education and Training Board
FET	Further Education and Training
IVET	Initial Vocational Education and Training
NFQ	National Framework of Qualifications
RPL	Recognition of Prior Learning
QQI	Quality and Qualifications Ireland
SME	Small and medium-sized enterprises
SOLAS	An tSeirbhís Oideachais Leanúnaigh agus Scileanna, 'Further Education and Skills Service' (State agency responsible for FET)
UK	United Kingdom
US	United States
VET	Vocational Education and Training

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list of interviewees

Table 1.   **A list of interviewees**

No.	Name and surname of the interviewee	Type of interviewee (stakeholder group)	Country/region/sector	Date of the interview
	Ciara Ni Fhloinn, Flexible Learning Manager, Enterprise, Employees & Skills	National authority (SOLAS)	National	6.5.21
	Barbara Kelly, Director of Qualifications	National authority (Quality & Qualifications Ireland)	National	4.5.21 and 3.6.21
	Prof. Mairéad Nic Giolla Mhichíl, Associate Professor and Senior Research Fellow	National Institute of Digital Learning, Dublin City University	National	12.5.21
	Mary Lyons, Director Enterprise, Employees & Skills	National authority (SOLAS)	National	25.5.21
	Dr Roisin Donnelly, previously Senior Project Manager in Professional Development, National Forum for the Enhancement of Teaching and Learning in Higher Education, now Head of School of Management, Technological University Dublin	National Forum for the Enhancement of Teaching and Learning in Higher Education	National	20.10.21
	Andrew Flood, Chief Executive Officer	Private Microcredential Provider (Prodigy Learning)	International and national	28.10.21

	Charles Gorney, Adult Education Officer	VET provider (Donegal Education & Training Board)	Regional	11.11.21
	Eileen Cullen, Head of Training and Innovation Services	VET provider (Kildare & Wicklow Education & Training Board)	Regional	18.11.21
	Patrick Flanagan, Subject Matter Expert in Education and QA	VET provider (Kildare & Wicklow Education & Training Board)	Regional	18.11.21