



European project MICROBOL

Micro-credentials linked to the Bologna Key Commitments

Draft publication
Desk research report

August 2020

Co-funded by the
Erasmus+ Programme
of the European Union



Table of contents

Foreword	5
Executive summary	7
1. Introduction	9
1.1 Definition	9
1.2 Distinctive features.....	12
1.3 Why get engaged with micro-credentials?.....	15
2. Status and trends	19
2.1 The profile of providers	19
2.2 Issues and constraints	20
2.3 Seeking a micro-credential framework.....	22
2.3.1 Europe.....	22
2.3.2 Initiatives from other regions	23
3. Applicability and use of the EHEA tools	29
3.1 Qualifications frameworks	29
3.2 Recognition.....	33
3.3 Quality assurance	35
4. Conclusion	39
Annexes	41
Annex 1: Selected European projects.....	41
Annex 2: Examples of European higher education institutions offering alternative credentials.....	45
Annex 3: Examples of alternative credential criteria and quality standards.....	48
Annex 4: Qualifications Framework for the European Higher Education Area (QF-EHEA)	50
Annex 5: Diploma Supplement, OEPSS Learning Passport and MicroHe Micro-Credential Meta-data Standard draft	52
References	57

Foreword

MICROBOL – Micro-credentials linked to the Bologna Key Commitments – is a two-year project co-funded by Erasmus+ KA3 Support to Policy reform, and more specifically “Support to the implementation of EHEA reforms”. It is linked to the aims of the new Erasmus+ Programme and the European Higher Education Area (EHEA) to increase access to continuous learning for all learners, regardless of their age, background, or experience.

The project focuses primarily on micro-credentials provided by higher education institutions or in conjunction with them, but also touches upon those entirely provided by companies or non-profit organisations, the system of ‘open badges’ and other bits of ‘micro’-learning, that might be recognised by higher education institutions.

The project will engage ministries and stakeholders involved in the Bologna Follow-up Group to explore whether and how the existing EHEA tools can be used and/or need to be adapted to be applicable to micro-credentials. To reach this objective the following activities will be carried out: desk research followed by three working groups focusing on the QF-EHEA and ECTS, on recognition, and on quality assurance. As a result of various meetings and workshops, during which ministry representatives, experts and stakeholders will evaluate the current practices and policies related to micro-credentials, the project will propose a common European framework for micro-credentials.

The project is coordinated by Flemish Ministry of Education and Training in cooperation with:

- The Ministry of Education and Culture of Finland
- CIMEA (Information Centre on Academic Mobility and Equivalence) of Italy
- EUA (European University Association)
- ENQA (European Association for Quality Assurance in Higher Education)

Executive summary

This report is part of the MICROBOL project and examines the status of micro-credentials, which have attracted interest in recent times as a means to increase the effectiveness and flexibility of higher education and to provide upskilling and reskilling opportunities for the labour force.

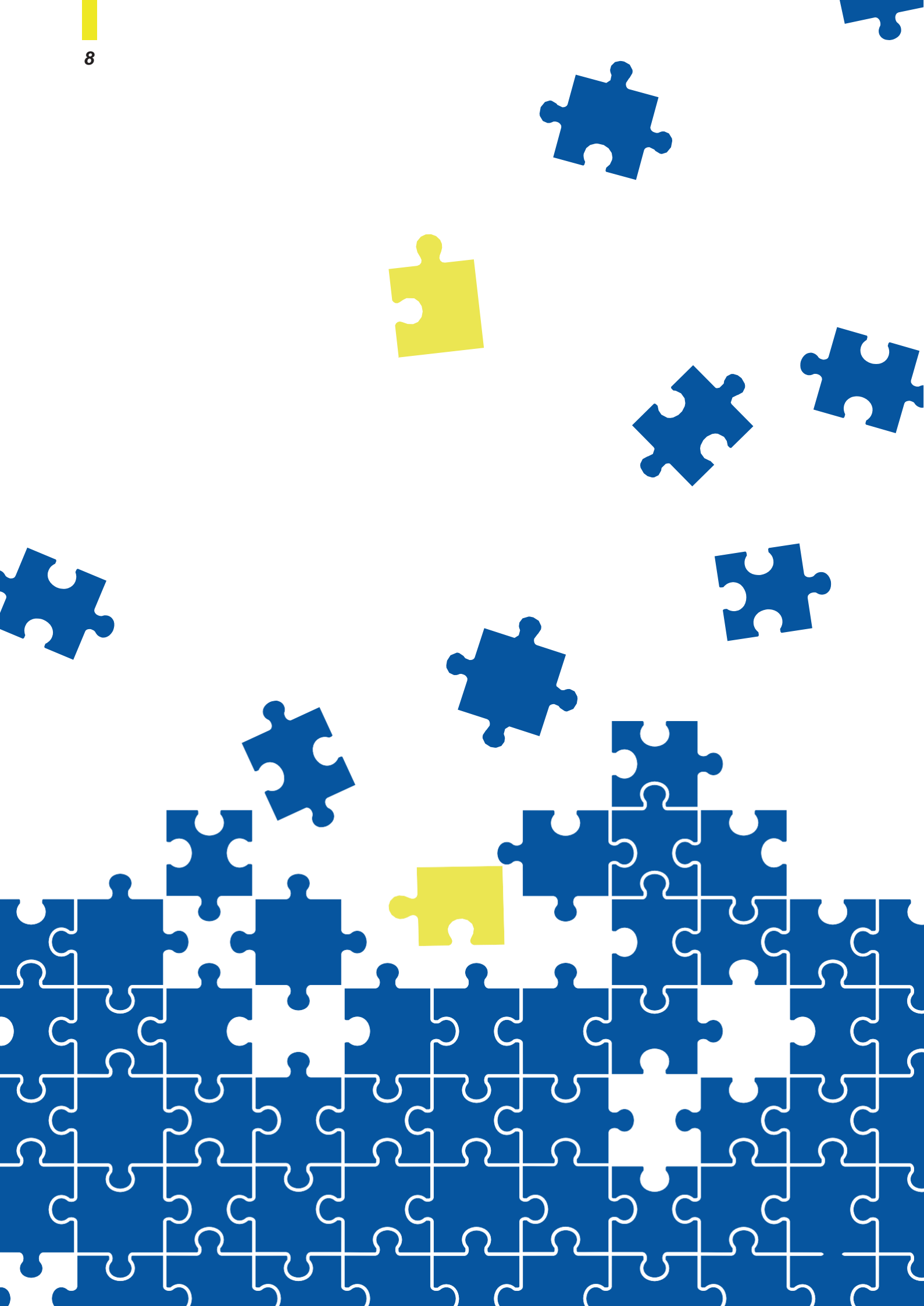
The report provides an overview of the existing definitions of micro-credentials, noting that a consensus on their definition is lacking. The definition adopted for the purposes of this report, which will be further refined in the course of the MICROBOL project, is the following:

A micro-credential is a small volume of learning certified by a credential. In the EHEA context, it can be offered by higher education institutions or recognised by them using recognition procedures in line with the Lisbon Recognition Convention or recognition of prior learning, where applicable. A micro-credential is designed to provide the learner with specific knowledge, skills or competences that respond to societal, personal, cultural or labour market needs. Micro-credentials have explicitly defined learning outcomes at a QF-EHEA/NQF level, an indication of associated workload in ECTS credits, assessment methods and criteria, and are subject to quality assurance in line with the ESG.

The report presents the diversity of existing micro-credentials in terms of mode of delivery, including place, pace, and time of study, volume of work, and basis for awarding the credential. Stackability, one of the typical characteristics of micro-credentials, is also discussed.

The report also explores how micro-credentials are perceived by different actors. Policymakers see micro-credentials as a way to address the short-term needs identified in society or the labour market. Higher education institutions, which are key providers of micro-credentials, see them as a way to provide more targeted and specialised training. Learners perceive them as an entry mechanism to a degree programme or as a way to acquire interdisciplinary knowledge and skills. Yet, employers seem to be unfamiliar with micro-credentials and generally do not consider alternative credentials as substitutes for conventional higher education qualifications but rather as complementary to them. The review of state of play indicates that the lack of a clear definition and of standards regarding the mode of delivery, duration, assessment process, validation, stackability, or incorporation of micro-credentials into larger credentials creates confusion among all concerned.

Against this backdrop, the report concludes by discussing how the existing EHEA tools can be used for or adapted to accommodate micro-credentials without stifling the capacity to promote innovation and flexibility usually associated with them. The key documents reviewed indicate that to a large extent the EHEA tools are applicable to micro-credentials, but further reconsideration of their scope, use and interpretation is needed. In this respect, the report poses a set of questions in relation to each of the EHEA tools in order to guide the next stages of the MICROBOL project.



1 Introduction

In the European policy discourse the increasing need for upskilling and reskilling the labour force on the one hand, and the emphasis on student-centred learning and need for flexible learning paths on the other, have led to the emergence of and increased attention to new credentials and short study courses, often referred to as micro-credentials.

Micro-credentials have been identified as a significant element in the European Union's European Education Area as indicated by the recently published EU Skills Agenda where the Action 10, "A European approach to micro-credentials", is among the EU tools and initiatives supporting lifelong learning (European Commission, 2020). In order to develop the European approach to micro-credentials, the European Commission mandated in spring 2020 the Micro-credentials' Consultation Group¹. Similarly, in view of the rapid changes in our societies and economies, micro-credentials have been discussed when preparing the forthcoming 2020 Communiqué of the ministers of education in the European Higher Education Area (EHEA) as a means to respond to learners'² needs for upskilling and reskilling (Bologna Process, 2020).

This report forms the first stage in the MICROBOL project. It provides an overview of the existing terminologies and the distinctive features of micro-credentials, examines their general status and development and how they are perceived by different actors and reflects on how the existing EHEA tools can be used for or adapted to micro-credentials. The overall purpose of the report is to inform and steer further discussion in the next stages of the MICROBOL project and to serve as an overview of state of play of micro-credentials beyond the scope of the project.

The report draws largely from a review of existing literature, policies and results of a selection of previous European projects examining micro-credentials (see Annex 1).

1.1 Definition

Micro-credentials, including awards, badges, and certificates, are not new in our societies. Symbols and badges have been used to mark achievements in many areas such as military, industry, business, sports, entertainment, group programmes (e.g., scouts), as well as in education. As the needs of society have changed and globalisation and technology developed, these have become more popular (Ellis et al., 2016).

The Diploma Supplement defines a credential as "a term sometimes used to refer to a qualification" (p. 12). The definition of a qualification³ does not refer to the size of the credential but mainly to the issuing body (competent authority) and the issuing condition (successful completion). In the case of the term micro-credential, the prefix 'micro' implies that it refers to a small credential.

¹ The European Commission's Micro-credentials Consultation Group is expected to develop a report by autumn 2020 for the Commission on common characteristics of a European Approach for Micro-credentials and a roadmap of actions to be taken to ensure the take-up, validation and recognition of micro-credentials.

² This report uses both the term learner and student. The former refers to the individuals taking micro-credentials offered by other providers than higher education institutions while for the latter this report uses the same definition as the 2015 ECTS Users' Guide: "the term student is used to encompass all learners in higher education institutions (whether full-time or part-time, engaged in distance, on-campus or work-based learning, pursuing a qualification or following stand-alone educational units or courses)." (p. 11)

³ "i) higher education qualification: any degree, diploma or other certificate issued by a competent authority attesting the successful completion of a higher education programme; ii) qualification giving access to higher education: any diploma or other certificate issued by a competent authority attesting the successful completion of an education programme and giving the holder of the qualification the right to be considered for admission to higher education. Also termed as any higher education award given for the successful completion of a programme of learning; a generic term that refers to the wide variety of higher education qualifications at different levels and across different countries (Bologna Process, 2018a, p. 14).

In the context of the Lisbon Recognition Convention, a higher education qualification is “any degree, diploma or other certificate issued by a competent authority attesting the successful completion of a higher education programme.” (Council of Europe, 1997, p. 3) As with the Diploma Supplement, there is no indication of the “size” of the qualification. The OEPass⁴ project distinguishes several types of educational credentials (see Figure 1).

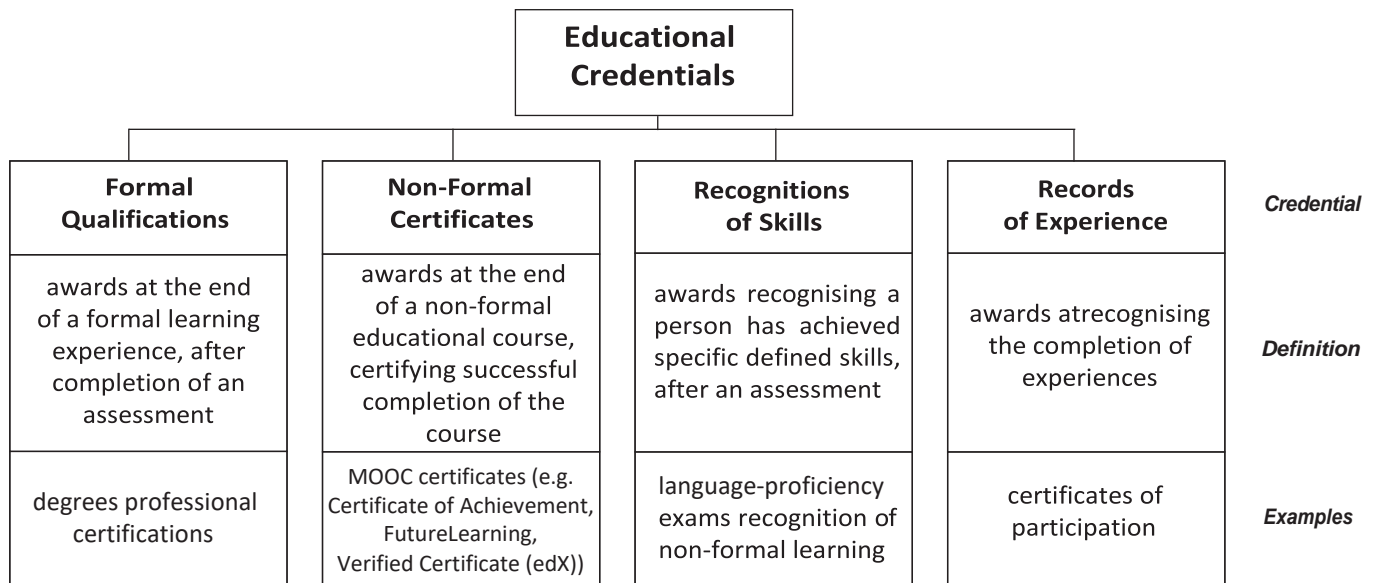


Figure 1: Types of Educational Credentials (Camilleri and Rampelt, 2018, p. 7)

There are several definitions of micro-credentials but no consensus on a definition exists in the framework of the European Higher Education Area, or outside its context. The term generally refers to both the learning activity leading to a credential and the credential itself. The existing definitions describe different characteristics of micro-credentials, such as size, purpose, categorisation (as formal or non-formal education units) and types of short courses they may encompass. Very commonly, they are linked to “digital”, which – slightly opaquely – may refer to the format of the credential, its presentation, the mode of provision or dissemination, content, or a combination of these.

Recent definitions include the following:

- An OECD working paper uses the term alternative credentials primarily introduced in the United States to draw contrast with credentials traditionally awarded by higher education institutions at the completion of study programmes. In the paper the term is defined as “credentials that are not recognised as standalone formal educational qualifications” (Kato et al., 2020, p. 8).
- A UNESCO study on digital credentialing defines the micro-credential as “a term that encompasses various forms of credential, including ‘nano-degrees’, ‘micro-masters credentials’, ‘certificates’, ‘badges’, ‘licences’ and ‘endorsements’. As their name implies, micro-credentials focus on modules of learning much smaller than those covered in conventional academic awards, which often allow learners to complete the requisite work over a shorter period.” (Chakroun and Keevy, 2018, p. 10).
- The MicroHE project defines a micro-credential as “sub-unit of a credential or credentials that could accumulate into a larger credential or be part of a portfolio. Examples are: Verified Certificates, Digital Badges, MicroMasters, Nanodegrees” (MicroHE Consortium, 2019, p. 12). The project identifies the following

⁴ <https://oepass.eu/>

main key features of micro-credentials: modular, stackable, portable, digital, and universal.

- The stackability of micro-credentials is also referred to in the definition formulated by the European Consortium of Innovative Universities (ECIU): “certification of learning that can accumulate into a larger credential or degree, be part of a portfolio that demonstrates individuals’ proof of learning, or have a value in itself.” (ECIU, 2020, p. 1).
- The European Short Learning Programmes project (e-SLP project) consortium uses the term short learning programmes and defines them as “a group of courses (units, modules or other learning building blocks) with a common subject focusing on specific needs in society and which are part of larger degrees.” A short learning programme usually has a volume of 5-30 ECTS points (e-SLP, 2019).
- The e-Valuate project makes use of the term stand-alone e-learning which comprises all forms of e-learning that are offered outside of an accredited degree programme. Thus, this definition includes the individual courses offered via online learning platforms by higher education institutions and online providers outside formal higher education (e-Valuate consortium, 2019, p. 3).
- The International Council for Open and Distance Education (ICDE) defines micro-credentials as “a credential issued for a relatively small learning project that consists of several modules in a given subject” and points out that the term in some cases has been defined by the issuing institution (International Council for Open and Distance Education, 2019, p. 45). The ICDE working group adopted the term of alternative digital credentials (ADCs),⁷ specifying that ADCs are different from badges, which they consider as a general term under which ADCs lies, and from micro-credentials, which may or may not be digital (ibid., p. 3).
- The New Zealand Qualifications Authority has introduced a micro-credential system as part of New Zealand’s regulated education and training system. In this system “a micro-credential certifies achievement of a coherent set of skills and knowledge; and is specified by a statement of purpose, learning outcomes, and strong evidence of need by industry, employers, iwi⁸ and/or the community. They are smaller than a qualification and focus on skill development opportunities not currently catered for in the regulated tertiary education system. At a minimum, micro-credentials will be subject to the same requirements as training schemes or assessment standards and will also be required to be 5–40 credits in size.” (NZQA, 2019a).
- The Australian expert review team, in its review of the Australian Qualification Framework, adopted the definition of a micro-credential proposed by Emeritus Professor Beverley Oliver: “a certification of assessed learning that is additional, alternate, complementary to or a formal component of a formal qualification.” (Oliver, 2019, p. 19 as cited in AQF Expert Panel Review, 2019).
- Pickard et al. (2018) define micro-credentials as a learning activity consisting of “more than a single course but less than a full degree”. The authors specify that micro-credentials in the field of Massive Online Courses (MOOCs) are labelled differently across providers (e.g., MicroMasters (edX), Nanodegree (Udacity), and Specialisation (Coursera)) (pp. 17–21).

Building on this backdrop of diverse definitions, this report uses the following working definition, which will be further refined in the course of the MICROBOL project:

⁵ Stackability means that micro-credentials can be accumulated and grouped over time, building into a larger, more recognisable credential (Kazin and Clerkin, 2018, p. 7).

⁶ Portability means that the learner may share and translate credentials from one context to another and represent them in different combinations for different audiences (Barabas and Schmidt, 2016, p. 8).

⁷ The working group defines each of the name components as follows: alternative as certifications that are not what institutions issue in the form of transcripts, digital as determining the form of presentation, dissemination, and storage of certification, and credential as a general term representing the attestation of learning or competency (International Council for Open and Distance Education, 2019, p. 3).

⁸ “The Māori-language word iwi means “people” or “nation”, and is often translated as “tribe”, or “a confederation of tribes.” (Iwi, 2020).

A micro-credential is a small volume of learning certified by a credential. In the EHEA context, it can be offered by higher education institutions or recognised by them, using recognition procedures in line with the LRC or recognition of prior learning (RPL), where applicable. A micro-credential is designed to provide the learner with specific knowledge, skills or competences that respond to societal, personal, cultural or labour market needs. Micro-credentials have explicitly defined learning outcomes at a QF-EHEA/NQF level, an indication of associated workload in ECTS credits, assessment methods and criteria, and are subject to quality assurance in line with the ESG.

1.2 Distinctive features

Micro-credentials come in many formats: they complement degree programmes, act as stand-alone units of learning, or are structured in a sequence of courses that can be eventually embedded within or cumulate into a larger credential. The types of micro-credentials are manifold and may include:

- certificates, whereby a distinction is typically made between:
 - academic certificates which signal the completion of an organised learning activity and are usually awarded by educational institutions. In some cases, they grant academic credits applicable towards degree programmes
 - professional/industrial certificates which are awarded by professional bodies, industries or product vendors;
- micro-certifications driven by industries such as IT and cybersecurity;⁹
- short courses provided online such as MOOCs or Small Private Online Courses (SPOCs) or on-site;
- boot camps (short, intensive training programmes on a very specific learning outcome/ qualification);
- digital badges,¹⁰ also called web badges or ebadges;
- open badges;¹¹
- nano-degrees;¹²
- MicroMasters.¹³

⁹ <https://www.devopsdigest.com/micro-certification-trend-growing-in-it>

¹⁰ SURFnet (2016) defines them as “digital pictograms or logos that can be shared across web to show accomplishment of certain skills and knowledge” (p. 3). Similarly, Janzow (2014) defined a digital badge as a “digital representation of a learning outcome. It could represent a certification, a credential, a competency, or a soft skill.” (p. 9) A list of badge issuing platforms can be found here: <http://www.badgealliance.org/badge-issuing-platforms/>

¹¹ According to OpenBadges these are digital badges with embedded metadata about the skills and achievements they represent. They comply with the Open Badges Specification, are shareable across the web and verifiable. (<https://openbadges.org/>)

¹² Nano-degree is the term used by Udacity to indicate an online project and skills-based educational credential programme (<https://www.udacity.com/nanodegree>).

¹³ <https://www.edx.org/micromasters>

Delivery mode

The mode of delivery of micro-credentials can be online, face-to-face, or blended. However, micro-credentials tend to be delivered online (Kato et al., 2020, p. 18). This type of delivery usually offers learners flexibility in terms of pace and time of study. Fifty-three percent of the higher education institutions responding to an EUA survey indicate that there is a growing demand for short non-degree courses provided in fully online mode, and 65% indicate that there is a growing demand for blended mode provision.¹⁴

A prominent example of micro-credentials delivered online are the MOOCs. According to Class Central, in 2019 there were over 900 higher education institutions and nearly 500 companies and other organisations offering more than 13 500 MOOCs, usually in co-operation with education technology companies and via online learning platforms, and over 110 million individuals (excluding China) signed up for MOOCs (Shah, 2019).

Micro-credentials can be also offered in a face-to-face mode. For instance, higher education institutions provide them as part of the continuing education programmes organised within the premises of the institution, often during evenings or weekends. They also offer certificates and badges to degree students following an (often extra curricula) achievement of a certain milestone or unit of study that focuses on a specific skill or competence (EDUCAUSE, 2019; Dakovic and Loukkola, 2017, pp. 9-11). These can be mentioned in the diploma certificate, in a learner's CV or portfolio, or can be accumulated and displayed on platforms such as LinkedIn.

Blended or hybrid provision of micro-credentials is common but tends to be more costly for both the participants and the providers. Yet, the blended provision seems to have a good impact on learning outcomes mainly for at-risk populations (Kato et al., 2020, p. 11). For example, SPOCs, which stand for Small Private Open Courses, address a small, local group of people, offer a tailor-made course and usually support blended learning and flipped classroom methods, while the students remain part of a community or campus.

Duration

The time it takes to complete a micro-credential varies depending on their type, provider, and area of focus, etc. This variation is observed between types of micro-credentials and within the same type. For example, based on an analysis of more than 450 MOOC-based micro-credentials, Pickard (2018) noted that the time it takes to complete a MOOC varied from 3 to 12 months. The average minimum effort required per week in the same sample varied from 3 to 10 hours.

Some micro-credentials are run on a schedule with a defined start and end date while others are self-paced – learners being able to progress as quickly or slowly as they wish. Some establish a time limit until which learners can access learning opportunities and materials. Compared with the education programmes that lead to a conventional qualification, the completion time of micro-credentials is typically shorter.

Assessment

The basis for validation of learning leading to an “alternative credential” (certificate, badge, micro-credential) vary greatly. A credential may be awarded based on attendance and/or assignments, passing an examination or a combination of both (see Figure 2). Kato et al. (2020) found that credentials obtained as a result of passing an examination may be valid for a limited period of time and may require retaking the examination or fulfilling specific requirements periodically (e.g., professional training in IT or management fields), while credentials which are granted based on attendance and/or assignments tend to have lifetime validity (p. 14).

¹⁴ The survey was carried out from April to June 2020 in the context of the DIGI-HE project; the publication including full results is forthcoming.

MOOC platforms offer two types of digital certificates, namely certificates that confirm participation in/ completion of a course and certificates that verify the learner's identity and confirm attainment of learning outcomes (Witthaus et al., 2016, p. 23). For instance, EdX specifies on its website that in order to earn a Verified Certificate, the learner needs to purchase the verified track, complete the photo verification successfully (this allows the learner to complete the course assignments) and to earn the needed passing score before the course end date (EdX, n.d.).

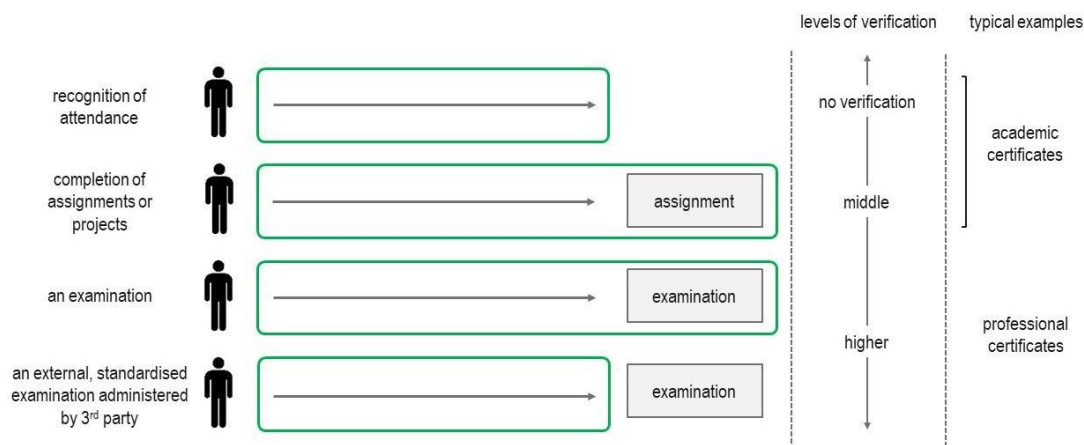


Figure 2: Different types of validation processes (Kato et al., 2020, p. 14)

Another important distinction among existing micro-credentials is that some of them bear credits while others do not. The assessment procedure of credit-bearing micro-credentials is aligned to a conventional qualification level. Therefore, the duration and workload required from the learner must correspond to the number of credits attributed to the target qualification(s). Non-credit bearing micro-credentials, on the other hand, carry an assessment that may or may not correspond to a formal qualification level and thus the required duration and effort may or may not be aligned to “academic standards” (Oliver, 2019, p. 20).

Stackability

Another characteristic of micro-credentials is that they can be stackable. Some definitions of micro-credentials (see MicroHE and ECIU definitions above) highlight the possibility of integrating them as parts of another larger credential. Micro-credentials can thus be perceived as part of a movement toward modularity in higher education, meaning that education provision can be divided in smaller pieces completed as separate units or they can be stacked and possibly combined with other units and as a result form a larger unit of learning (Pickard, 2018).

Cost

For the learners, micro-credentials may appear less costly than conventional degrees (Kato et al., 2020). Many providers allow learners to participate for free, or at a low fee, while they may charge a fee for the actual award or certificate that still appears relatively low compared to that of a full degree. Nevertheless, the perception of cost varies from one system to another. In systems where the tuition fees for conventional degrees are high (e.g., the United States) the difference of price can be significant, which makes micro-credentials attractive due to their apparent low price. In systems where there are no or low tuition fees, as is the case in many countries across Europe,¹⁵ the difference of price is not big. However, higher education institutions charge full fees for lifelong learning courses in some European countries such as Austria and Germany.

For higher education institutions it is costly to develop and maintain micro-credentials. For example, developing a MOOC may require course content development and creation of online learning materials, with a professor spending more than 100 hours recording the MOOC videos, in addition to other preparation (Kolowich, 2013). The OECD (2016) study about the trends and perspectives on MOOCs found that, because of the high costs for developing and maintaining MOOCs, most higher education institutions did not consider MOOCs to be a means to improve cost-efficiency of their institution's education provision (p. 15).

1.3 Why get engaged with micro-credentials?

Policymakers' perspective

The increasing need for upskilling and reskilling the labour force as well as the need for flexible and inclusive learning paths in order to accommodate the increasingly diverse student population have resulted in policymakers turning their attention to new credentials and small learning experiences.

Compared with conventional degrees, micro-credentials are seen and promoted as a shorter, more targeted and flexible way to address the short-term needs of society or the labour market. Micro-credentials thus fill the gap between academic programmes and the skills required by the labour market. They contribute to the efficiency of education systems, driving innovation that allows new kinds of providers to compete on the higher education marketplace. (Lumina Foundation, 2019; The Chronicle of Higher Education, 2019).

Higher education institutions' perspective

For higher education institutions, micro-credentials offer a way to provide more targeted and specialised training than that offered through conventional degrees (Fain, 2018). The main reasons to offer micro-credentials may be to: increase their visibility and reputation by widening geographical reach and attracting more diverse groups of students; increase their responsiveness to students' and labour markets' demands; experiment with new pedagogies and technologies; and generate additional income or reduce costs (Jansen and Schuwer, 2015, p. 5).

One-quarter of the respondents to surveys of higher education institutions in Europe and the United States reported that increasing visibility is a primary objective of offering MOOCs. European institutions aimed to reach new students, while American institutions sought to drive student recruitment (Allen and Seaman, 2015; Jansen and Schuwer, 2015). In another survey of 190 higher education institutions in the United States, 64% of the respondents either strongly or somewhat agreed that alternative credentials are an important strategy for their institutions' future, and more than half considered them to be a supplementary source of income (Fong, Janzow and Peck, 2016, p. 13).

Further, 62% of the institutions responding to EUA's Trends 2018 survey believed there is a growing demand for short-term (non-degree) learning opportunities (Gaebel and Zhang, 2018, p. 45). Similarly, the 2018 Bologna Process Implementation Report notes that in most EHEA countries, more than 50% of the institutions offered flexible or alternative learning paths (p. 66).

Learners' perspective

Some learners see micro-credentials as an entry mechanism to a degree programme. A survey among learners beginning MicroMasters and Specialization programs showed that 12% of the respondents expected to apply for some type of conventional degree after completing an alternative credential (Hollands and Kazi, 2019).

More often, however, learners see micro-credentials as a way to acquire interdisciplinary knowledge and skills to increase their competitiveness in the labour market. Compared to conventional degrees, micro-credentials can offer the learner more focused content, more practical learning experiences, more up-to-date information, more personalised learning, more open access to knowledge and more flexibility in planning their studies (MicroHE Consortium, 2019, p. 15).

Indeed, Kato et al. (2020) found that the two main motivations for learners to take micro-credentials are the acquisition and verification of skills or knowledge (p. 24). Data from the Programme for the International Assessment of Adult Competencies (PIAAC) indicates that approximately 70% of the individuals who participated in non-formal education and training took part in job-related programmes, around half of them participating with the aim of improving their career prospects or job performance (OECD, 2019). Also, 55% of the institutions responding to a recent EUA survey indicate that the non-degree short courses mainly serve lifelong learners, whereas 43% indicate that these courses are an alternative to studying a master's degree for some students (forthcoming study).

Micro-credentials can also be taken by degree students with the aim of integrating them into a conventional qualification. For this to be possible, larger qualifications/education programmes need to be unbundled into smaller modules, enabling learners to re-bundle them according to their personal needs and interests and to achieve a larger entity (e.g., a degree).

Finally, the possibility of obtaining education and credentials from higher education institutions with a lower cost and without rigorous admission requirements is appealing to some learners. A Class Central learner survey showed that approximately half of the learners who were taking a MOOC were considering paying for a certificate if the MOOC was offered by a higher education institution (Shah, 2017).

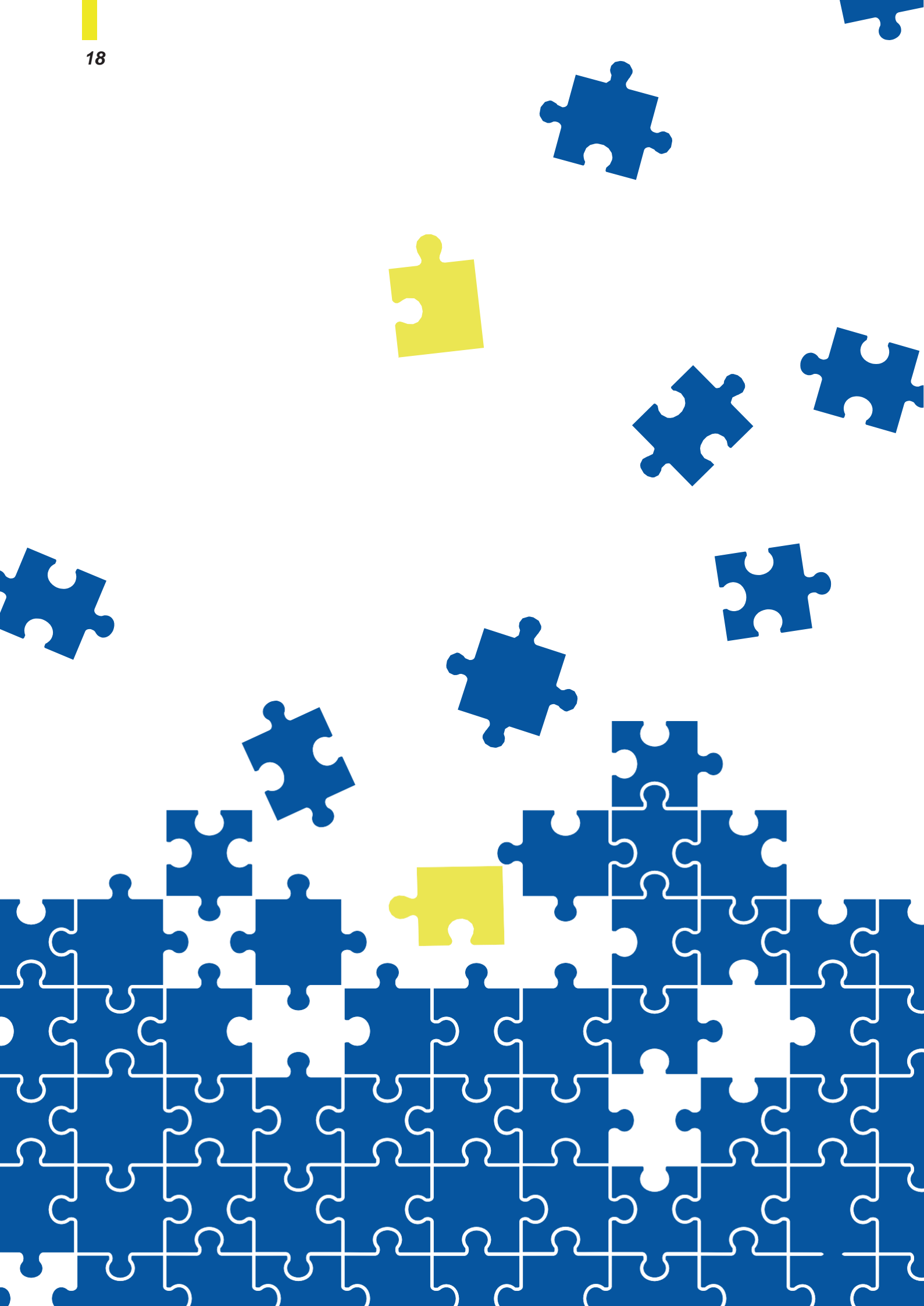
Employers' perspective

Employers need a wide range of employees with diverse and evolving skills; however, often acquiring these skills does not require years of study. Individuals may participate in workshops, short programmes or voluntary work that equip them with skills and qualify them to work in specific fields. For example, a study that investigated whether having MOOC experience makes a difference in job applications found that 73% of employers see them positively and consider that the participation in a MOOC can reflect the candidate's personality traits, such as curiosity (81%), autonomy (60%), ability to work from a distance (59%) and self-discipline (55%) (Dussarps, 2018).

Nonetheless, employers do not consider the alternative credentials as substitutes for conventional higher education qualifications but rather as complementary to them. A survey conducted in the United States revealed that over half of the responding hiring managers consider conventional qualifications as being "fairly reliable representations of candidates' skills and knowledge", and around three-quarters believed that the completion of a qualification was a "valuable signal of perseverance and self-direction" (Gallagher, 2018, p. 5). However, because employers are not always aware of what knowledge, skills and competences a graduate of a certain programme is supposed to possess, micro-credentials may help them to understand specific skills that a prospective employee offers and to identify the skills they are looking for faster and more easily.

Nevertheless, employers seem to be unfamiliar with micro-credentials. The MicroHE project interviews revealed that the majority of employers interviewed were not aware of micro-credentials and associated them only with attendance certificates granted for life-long learning courses or professional development programmes (MicroHE Consortium, 2019, p. 27). The study conducted by Gallagher (2018) in the United States showed similar results, with only 30% of the hiring managers surveyed having encountered micro-credentials in a recruiting process, and 24% never having heard of them. More than 60% of the respondents, however, thought that the need for continuous lifelong learning will lead to demand for higher levels of education and more credentials (p. 3).

Employers' lack of familiarity with micro-credentials and their hesitation to cover the related costs for their employees may be the reason that only some employers make use of them for on-job training. For example, a survey of 262 learners who completed a Coursera Specialization and edX MicroMasters revealed that 64% of the respondents paid the course fees themselves, while employers paid the fees only for 13% and contributed towards the fees of another two percent of them (Hollands and Kazi, 2019).



2 Status and trends

This section discusses the main providers of micro-credentials, the issues and constraints that limit the full impact and potential of micro-credentials and describes some initiatives aiming to develop a framework for micro-credentials.

2.1 The profile of providers

There is a wide range of micro-credential providers. Often, the credentials are provided in collaboration across various types of organisations, such as higher education institutions, businesses and non-governmental organisations (Kato et al., 2019, p. 19).

Higher education institutions play an active role in this field. They provide credit-bearing micro-credentials (for which a learner earns credits at the completion) and non credit-bearing micro-credentials (for which a learner does not earn credits). They organise their alternative credential programmes usually through the departments of continuing education or in partnership with other higher education institutions (e.g., European Consortium of Innovative Universities,¹⁶ Young Universities for the Future of Europe¹⁷) or with online programme managers such as 2U,¹⁸ Online Education Services¹⁹ and Keypath.²⁰ These offer online course development for micro-credentials, degree courses, and MOOCs, either on a global platform (e.g., Coursera, edX, FutureLearn, Udacity, XuetangX etc.) or on the institution's own platform (Oliver, 2019, p. 11).

Higher education institutions may also outsource provision of micro-credentials to other providers, but this practice is not common among the European higher education institutions. A United States study revealed that two-thirds of institutions award alternative credentials in partnership with other bodies, such as professional associations (29%), education technology companies (24%), and online learning platforms (10%) (Fong, Janzow and Peck, 2016, p. 10).

A survey among European higher education institutions indicated that the most common types of credentials offered by them were certificates (41%) and badges (52%) (Szalma and Zarka, 2018, p. 9). Some examples of European higher education institutions offering alternative credentials are presented in Annex 2.

While MOOCs have been offered by hundreds of providers since their appearance, higher education institutions have offered most of them either as separate learning modules or as part of a conventional degree. Nowadays, all MOOC platforms facilitate and offer at least one type of micro-credential (see Table 1). Shah (2020) indicates that the micro-credential offer has continued to grow in recent years and by the end of 2019 there were more than 800 micro-credentials on the market, Coursera's Specialization representing almost half of them.

¹⁶ <https://www.eciu.org/>

¹⁷ <https://www.yufe.eu/>

¹⁸ <https://2u.com/>

¹⁹ <https://www.oes.edu.au/>

²⁰ <https://keypathedu.com/online-program-management>

Platform	Micro-credentials	Registered users
Coursera	Specialization, MasterTrack Certificate, Professional Certificate	37 million
edX	XSeries, MicroMasters, Professional Certificate, Professional Education	18 million
Udacity	Nanodegree	10 million
FutureLearn	Program, Graduate Certificate, Graduate Diploma	8.7 million
Kadenze	Program	data N/A

Table 1: Micro-credentials on the market today; Source: Shah (2020) and Shah (2018)

It is important to note that the number of registered learners usually is higher than the number of learners who start the courses, which in turn far exceed the number of those that complete the course or receive a credential (Almeda, Zuech et al., 2018; Yuan and Baker, 2018).

There are also some specialised learning platforms that focus on particular professions and occupations. For example, in the education sector, alternative credential programmes are used as a tool for continuing professional development and career advancement.

In addition, a growing number of employers and professional associations design their own competency-based offerings. They may include a pathway to a degree offered by a traditional provider, e.g., some IBM badges can be used towards professional master's degree programmes offered in partnership with Northeastern University in the United States (Oliver, 2019, p. 13). Most large companies provide in-house training programmes for their employees, some of which lead to alternative credentials (mostly professional certificates) and are part of the company's internal recognition and incentive schemes (deLaski, 2019).

Furthermore, another type of provider that develops training offerings are human resources and recruitment companies. For example, LinkedIn provides a more personalised learning experience to its users through the online course provider Lynda.com. It also offers the Skill Assessments feature, which allows a user to demonstrate the skills and knowledge featured on the profile by completing assessments specific to these skills. In addition, LinkedIn Learning allows a user to develop business, technology-related, and creative skills through expert-led course videos and then display the courses and skills acquired on their LinkedIn profile after completion.

Finally, other organisations, such as the British Council, the International Labour Organization, and the World Bank offer alternative credentials in form of certificates.

2.2 Issues and constraints

Currently, there are no standards regarding the delivery mode, duration, assessment process, validation, stackability, or incorporation of micro-credentials into larger credentials.

The lack of a clear definition for micro-credentials creates confusion among learners, employers, and academic staff. Interviews carried out in the context of the MicroHE (2019) project showed that only some experts in educational policies and academic environment understand clearly what the term micro-credential means while, in most cases, for students and employers, it is totally unknown. Most of the academic staff are aware of the term, but many interviewees mistakenly thought that a micro-credential is smaller than one ECTS credit.

While some micro-credentials represent completion of a certain course or programme and clearly define the set of acquired learning outcomes, others do not. This makes it difficult for employers to understand what these credentials mean, what their value is, and how they compare with conventional programmes and qualifications. Similarly, lack of clarity makes it particularly difficult for students to make a choice regarding their education. This is the case above all for those students who receive less support when navigating the complex credential landscape, e.g., low-income students, adult learners and first-generation students (Lumina Foundation, 2019).

Regarding higher education institutions, the funding mechanisms in many continental European countries do not support the development of micro-credentials. The funding mechanisms used by public authorities to allocate public funding to higher education institutions vary from one country to another. The most common indicators used in national or system-level funding formulae are the number of students and graduates at bachelor and master's level and the amount of external funding obtained (Loukkola et al., 2020, p. 12).

Furthermore, there is no mechanism for validation of all micro-credentials, partly due to the lack of definition and thus also of explicit criteria. As a result, the myriad of micro-credential providers threatens their credibility and the sheer multitude of credentials causes them to be perceived as having little or no value. MicroHE interviews revealed that students who completed some short courses do not intend to ask their institutions to validate or recognise the credentials because of strict requirements which usually do not allow validating or recognising micro-credentials. Therefore, earning a micro-credential makes less sense for them. Often their main motivation for studying for a micro-credential was the possibility to access quality content from sources other than their institution or to develop personal interests and/or hobbies, or for advancement in their workplaces (MicroHE Consortium, 2019, p. 14).

As in the case of conventional qualifications, quality, trust, recognition, and transparency are critical to the success of micro-credential provision and use. It has been argued that the main challenges in terms of recognition of micro-credentials might be cultural and structural (at both national and governmental levels) rather than methodological and operational. The latter, however, seem to receive more attention (ibid., p. 35).

The e-Valuate project recommended that providers should ensure more transparency by making available relevant information about the contents and quality of courses in order to facilitate the recognition process and help the recognition professionals to assess the credentials in a timely and correct manner. It further specified that providers should “[e]nsure that information about course content and learning outcomes remains freely accessible and does not disappear when the course is revised or no longer offered.” (e-Valuate consortium, 2019, p. 6)

Lastly, another issue common to conventional qualifications also, is the storage and portability of micro-credentials. The use of digital degree transcripts and the analytics systems that enable aggregation of massive datasets have progressed. Therefore, for micro-credentials that are mostly digital certificates, future aggregation may be possible if standards are adopted (Naughtin et al., 2017; EDUCAUSE, 2019; Friedman, 2019). Further development of the blockchain technology has the potential to increase trust in the information conveyed in micro-credentials and qualification transcripts provided (Grech and Camilleri, 2017; ICDE, 2019; Williams, 2019).

2.3 Seeking a micro-credential framework

Various stakeholders, such as governments, sectoral agencies, networks of providers and regulators have sought to define micro-credentials and establish frameworks to assure quality of their provision and recognition. Examples of alternative credential criteria and quality standards are presented in Annex 3.

2.3.1 Europe

The European Commission has launched the Digital Education Action Plan that provides new impetus for unbundling learning and digitalising credentials. It also proposes the integration of digitally-signed qualifications in Europass (European Commission, 2018). The new Europass²¹ platform launched in July 2020 allows learners to create their own profiles by listing all their qualifications, experiences and achievements and use a self-assessment tool to describe their skills, goals and interests. It also allows the creation and storage of third party certified, digitally signed credentials. The goal of the platform is to support its users to make the best use of their skills, qualifications and experiences (European Union, 2020). Furthermore, the European Commission has set up a Micro-credentials Consultation Group which aims to develop a common definition for micro-credentials; define their workload, learning outcomes and ECTS range; and explore how they can be recognised for further studies and/or employment.

In 2014, OpenupEd partners published the quality label²² for MOOCs tailored to both e-learning and open education. They view this label as a benchmarking and improvement-oriented tool that compares institutional performances with current best practices and leads to an increased quality of their MOOCs and their operation. OpenupEd Label also developed several checklists to support universities in self-assessing their MOOC development (OpenupEd partners, 2014).

The European MOOC Consortium, including FutureLearn, France Université Numérique (FUN), OpenupED, Miriadax, EduOpen and coordinated by EADTU, has published the Common Microcredential Framework (CMF). The aims of the framework are to standardise the micro-credential offer by Europe's leading MOOC platforms and the universities within their networks and to support institutions in creating a new kind of international and portable credential in lifelong learning. This framework sets out the following criteria for all new micro-credentials:

- Have a total workload of no less than 100 hours and no more than 150 hours (4-6 ECTS), including revision for, and completion of, the summative assessment.
- Be levelled at level 6 (Bachelor), level 7 (Master) and level 8 (Doctoral) with option for level 5 (in combination with ECTS) in the European Qualification Framework or the equivalent levels in the university's national qualification framework.
- Provide assessment enabling the award of academic credit, either following successful completion of the course or via recognition of prior learning upon enrolment as a student on the university's course of study.
- Operate a reliable method of ID verification at the point of assessment that complies with the university's policies and/or is widely adopted across the platforms authorised to use the CMF.
- Provide a transcript that sets out the learning outcomes for a course, total study hours required, EQF level and number of credit points earned.
- Courses should be designed so that the number of hours per week is manageable.
- Courses aimed at employees to develop workplace skills should combine theory and practice to ensure relevance in the workplace. (The European MOOC Consortium, 2019)

Based on the Common Microcredential Framework the German Forum for Higher Education in the Digital Age (Hochschulforum Digitalisierung) proposed some criteria for assessing the quality of micro-credentials. It also suggested to recognise these credentials as the fifth cycle of the EHEA, complementing the existing short cycle,

bachelor's, master's and doctorate programmes (Rampelt et al., 2019).

²¹ <https://europass.cedefop.europa.eu/>

²² <https://www.openuped.eu/quality-label>

2.3.2 Initiatives from other regions

The United States

In the United States, the Credential Transparency Description Language (CTDL) seeks to provide a common, unified, consistent, and transparent vocabulary for describing credentials, including diplomas, badges, certificates, certifications, licenses, and degrees of all types and levels (EDUCAUSE, 2018). In June 2019 there were 6142 credentials offered by 378 providers listed on the Registry (Oliver, 2019, p. 15).

Furthermore, the United States Council for Higher Education Accreditation (CHEA)²³ has outlined possible quality criteria for alternative credentials, which is presented in Table 3 (van der Hijden, 2019).

Typology	<ul style="list-style-type: none"> • Mission statement of the provider • Level referenced against a qualifications framework • Profile indication (e.g., research oriented, profession oriented, general interest oriented) • Workload indication (average time or credits) • Learning outcomes descriptors (knowledge, skills, degree of responsibility and autonomy) • Summative assessment • Certificates, diploma supplements, badges etc. acknowledging learning
Appreciation	<ul style="list-style-type: none"> • Uptake among learners • Higher education institutions accept the credential as part of accredited degree programs • Employers or employers' associations recommend the credential for hiring and promotion • Professional associations accept the credential for licensing purposes or continuing professional development
Reputation	<ul style="list-style-type: none"> • Past performance of the provider in education and research (e.g., rankings and citations) • Partnerships and collaborations of the provider (e.g., leagues)
Learner information	<ul style="list-style-type: none"> • Identification • Partnerships and collaborations of the provider (e.g., leagues)

Table 3: Source van der Hijden (2019, pp. 9-10)

²³ <https://www.chea.org/>

The CHEA Quality Platform has also developed in the context of its CHEA International Quality Group (CIQG) an external review methodology for digital credentials such as digital badges, digital certificates, nano-degrees and other micro-credentials, alternative providers of higher education and their performance and quality (ibid., p. 12).

Rutgers School of Management and Labour Relations with support from the Lumina Foundation, has also developed a quality conceptual model for non-degree credentials. It proposes the four elements and indicators of credential quality presented in Table 4.

Credential design	<ul style="list-style-type: none"> • Content relevance • Instructional process • Assessment process • Stackability and portability • Transparency • Accessibility and affordability
Competencies	<ul style="list-style-type: none"> • Demonstrated competencies including general knowledge, specialized skills, personal skills and social skills
Market processes	<ul style="list-style-type: none"> • Awareness of credential and/or credential granter • Endorsements and validations • Organizational policies and practices • State regulations • Employer hiring policies and practices • Educational institutions' recognition of learning

Outcomes	Individual
	Employment <ul style="list-style-type: none"> • Job attainment • Wage gains • Promotion • Retention Educational <ul style="list-style-type: none"> • Stacking of additional credentials • Completion of academic degree(s) Social <ul style="list-style-type: none"> • Improved health and well-being • Greater civic involvement • Intergenerational benefits
	Societal
	Employer <ul style="list-style-type: none"> • Employee pipeline • Better retention • Higher skills and productivity • Increased diversity Society <ul style="list-style-type: none"> • Better public safety • Increased efficiency • Reduced inequality • More civic engagement

Table 4: Source Van Noy et al., 2019, p. 7

Australia

The Expert Panel for the Review of the Australian Qualifications Framework (AQF) has proposed criteria for ‘shorter form credentials’, including micro-credentials. Because ‘shorter form credentials’ provide knowledge and skills at a variety of current AQF levels, the Expert Panel found it challenging to align them to AQF bands. The review concluded that it was premature to include shorter form credentials, particularly micro-credentials, as qualification types in the AQF and that the optimal way to recognise shorter form credentials, including micro-credentials, would be through credit and recognition of prior learning (Expert Panel for the Review of the Australian Qualifications Framework, 2019, p. 60).

More recently, OpenLearning Platform published the OpenCreds²⁴ Framework, which specifies that “an OpenCred may only be issued upon completion of a course that:

- implements best practices in learning design as set out in a quality assurance criterion;
- results in the learner producing authentic evidence of learning that demonstrates their development of knowledge, skills, and competency in a particular area.
- specifies indicative hours of learning, rounded to one of seven levels between 2.5 hours to 150 hours, to indicate the usual amount of time required for a new learner with little or no experience to develop the required competency or expected learning outcomes (as recommended in the AQF Review); and is,
- delivered via the OpenLearning platform, an Australian lifelong learning platform designed around the principles of social constructivism and authentic assessment.” (Brimo and Diaz, 2020, p. 5)

New Zealand

In 2018, the New Zealand Qualifications Authority (NZQA) included a micro-credential system as part of New Zealand’s regulated education and training system and developed guidelines and criteria for training schemes and micro-credentials as follows:

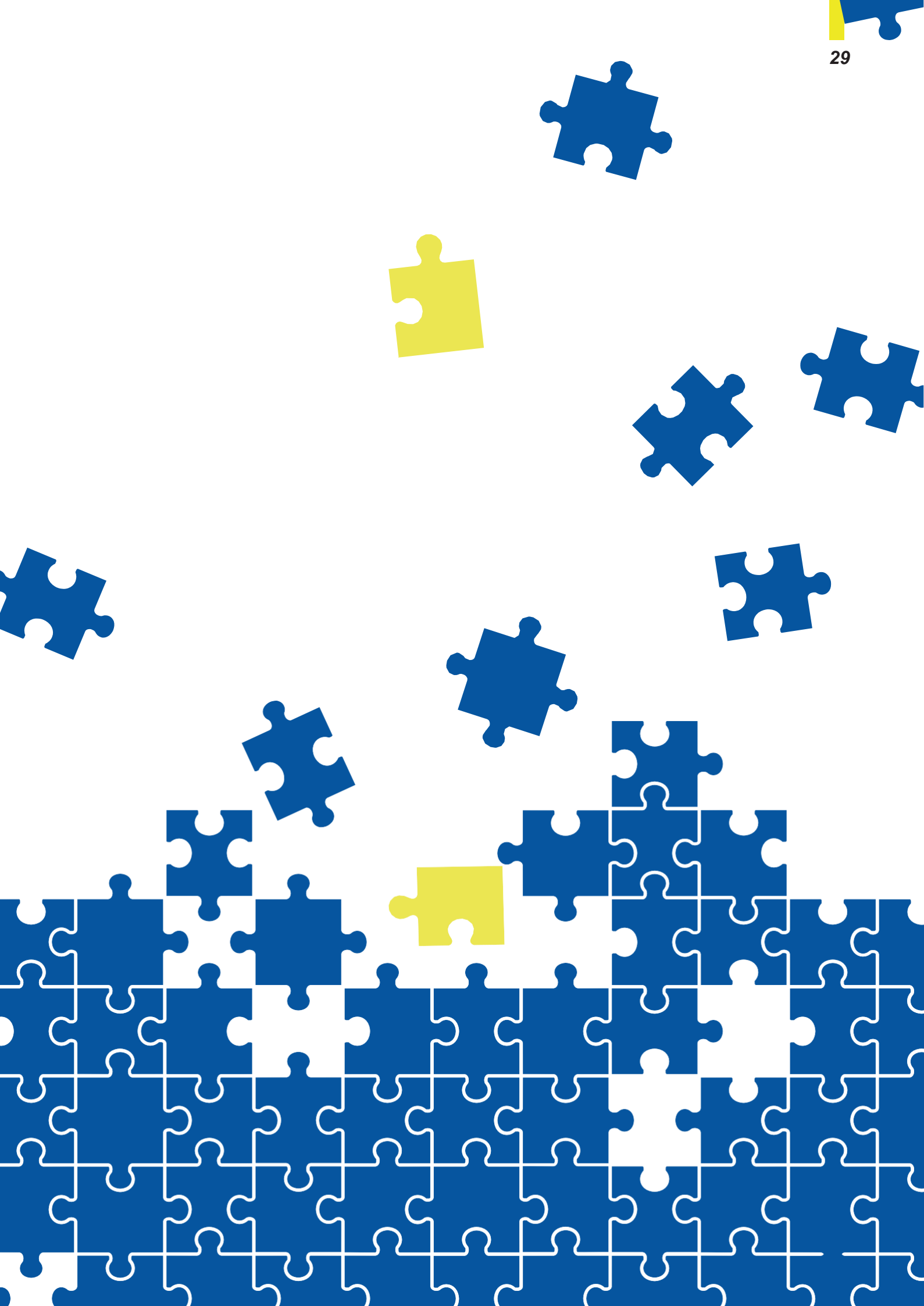
- A training scheme: a coherent arrangement of learning and training which is based on aims, outcomes, content and assessment practices and which leads to an award but does not, of itself, lead to an award of a qualification on the NZQF and can be up to 40 credits.
- A micro-credential: besides meeting all of the requirements of a training scheme, a micro-credential must certify achievement of a set of skills and knowledge; demonstrate evidence of demand from employers, industry and/or community; not duplicate learning opportunities approved by the NZQA, be reviewed on a yearly basis, and be of 5-40 credits in size (New Zealand Qualifications Authority, 2019a, p. 4).

²⁴ “OpenCreds are a distinct type of micro-credential, designed to meet the needs of the Australian education sector, industry, and most importantly its lifelong learners. [...] an OpenCred is a certification of assessed learning that is additional, alternative, complementary to or a component part of a formal qualification.” (Brimo and Diaz, 2020, p. 5)

In addition to these requirements, the NZQA also specifies that a micro-credential obtained through an industry training must involve one or more assessment standards listed on the Directory of Assessment Standards which certify the achievement of a specific set of skills and knowledge in workplace training. All micro-credentials need to include appropriate assessment activities to provide confidence the learner has achieved the learning outcomes at the appropriate NZQF level. Further, the NZQA provides information about how and which stakeholders can partner with tertiary education organisations to develop micro-credentials. After the NZQA approves a micro-credential, it is published on a micro-credential register which is freely accessible (New Zealand Qualifications Authority, 2019b).

Furthermore, New Zealand's Tertiary Education Commission (TEC)²⁵ offers funding for well-designed micro-credentials that meet the needs of learners, communities, and industries, and that support government priorities.

²⁵ <https://www.tec.govt.nz/funding/funding-and-performance/investment/plan-guidance/micro-credentials/>



3

Applicability and use of the EHEA tools

In the EHEA context, higher education systems and institutions make use of tools such as the qualifications frameworks (QFs), the European Credit Transfer and Accumulation System (ECTS), the Lisbon Recognition Convention (LRC), the Diploma Supplement (DS), and the Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG). Implemented at European, national, regional and institutional level, these instruments provide the basis for mutual trust and recognition by promoting transparency and offering a common language across borders.

These tools were largely developed during the first decade of the Bologna Process when the European Union also worked on the Lisbon Strategy including the Modernisation Agenda for Universities. These policies were a result of a set of pressures with which higher education systems and institutions were confronted. The most prominent was the growing importance of knowledge-based economies that placed higher education at the core of the national competitiveness agendas (Sursock, 2012). The focus in this context was on promoting quality, transparency and portability of conventional qualifications and increasing effectiveness of higher education institutions.

The diversity of micro-credentials providers and formats leads, however, to questions such as: How should the EHEA address micro-credentials? Are the EHEA tools applicable and suitable for micro-credentials, and generally for lifelong learning and open education? Or should amendments, additional policies or tools be developed to accommodate the diversification of higher education offer and providers? Should the EHEA consider all providers or only higher education institutions? Is a meta-framework regulating micro-credential provision needed? Or would such regulation be counterproductive and limit the innovation capacity of micro-credentials?

These questions are at the core of the MICROBOL project. The following sections examine whether and how the tools that relate to the key commitments of the Bologna Process (three-cycle structure and ECTS, recognition and Diploma Supplement, and quality assurance) can be used for micro-credentials or whether they have to be adapted. The questions arising from this examination are designed to guide the working groups during the next stages of the project.

3.1 Qualifications frameworks

The Framework of Qualifications of the European Higher Education Area (QF-EHEA)

Originally adopted in 2005, the QF-EHEA provides very general definitions of competence levels to be reached by any learner who completes a first, second or third cycle programme, and serves as the basis to which National Qualifications Frameworks (NQFs) in the EHEA are referenced.

The framework consists of the following cycles (including, within national contexts, the possibility of intermediate qualifications): first cycle (bachelor's degree), second cycle (master's degree), third cycle (doctoral degree) and a short cycle (within or linked to the first cycle). Each cycle is described in terms of learning outcomes and competences through generic descriptors and in terms of typical ECTS credit ranges, with the exception of the third cycle (see Annex 4). The descriptors were adopted as part of the framework and they offer generic statements of typical expectations of achievements and abilities associated with qualifications that represent the end of each Bologna cycle or level. The descriptors contain the following

elements: knowledge and understanding; applying knowledge and understanding; making judgements; communications skills; and learning skills. Successful completion of the previous cycle gives access²⁶ to the following one (Bologna working group, 2005).

In about half of 48 EHEA systems there are short-cycle qualifications linked to the first cycle (Bologna Process Implementation Report, 2018, p. 100). Countries that offer short-cycle qualifications must ensure proper recognition, also to enable graduates to progress within the first cycle bachelor programmes (ibid., p. 102). The short-cycle qualifications were already considered in the 2005 QF-EHEA. This was done in order to support mutual recognition of these qualifications between the systems where they exist, and to enhance their recognition in the systems where they do not exist but which may receive students that hold such qualifications (Bologna Process working group, 2005, p. 62).

The Ministerial Communiqué 2018 further defined the short cycle as a stand-alone qualification within the QF-EHEA. The Communiqué indicates that each country can decide whether and how to integrate short-cycle qualifications within its own national framework (Bologna Process, 2018b, p. 2). It is worth mentioning that there is a difference between short-cycle higher education and short-cycle tertiary education; the latter is not recognised as higher education and usually comprises vocational programmes. Research has found that the short cycle tends to attract students from socio-economically disadvantaged backgrounds, first-generation students, adult learners, and those from minority groups. Thus, they contribute to social equity and inclusion (Kirsch et al., 2003, p. 38; Kirsch and Beernaert, 2011, p. 12).

In some higher education systems, there are programmes that fall outside the QF-EHEA structure and are related to first, second and third cycle studies. For instance, in Ireland there is the “Higher Diploma”, a qualification building on the bachelor’s degree. Normally it lasts one year (60 ECTS credits) and is situated at the same level as first-cycle studies. The Netherlands refer to a two-year ‘associate-degree programme’, which used to be part of the bachelor’s degree at universities of applied sciences, but is now intended to become an independent programme. In the United Kingdom (Scotland) a postgraduate certificate of 30 ECTS is offered. It is positioned at level 11 or above in the Scottish Credit and Qualifications Framework (Bologna Process Implementation Report, 2018, p. 112).

The QF-EHEA is compatible with another meta-framework: the European Qualifications Framework for Lifelong Learning (EQF). The EQF is a reference framework developed within the European Union, consisting of eight levels also described in terms of learning outcomes. It includes all education levels, and all types of education (general or professional) regardless of learning contexts (formal, non-formal and informal). Due to the strong connection between the two meta-frameworks, most of the countries have developed or are developing national qualifications frameworks for lifelong learning that are compatible with both meta-frameworks (European Commission, 2008).

Micro-credentials can be positioned within formal education when leading to the award of credits and can be used as building blocks towards a larger qualification. In these cases, the QF-EHEA appears to be applicable to micro-credentials and the procedures and recommendations referring to the short cycle and the programmes that fall outside the QF-EHEA structure could set a useful precedent.

²⁶ Access is used in the QF-EHEA in “the same sense as in the Lisbon Recognition Convention, namely the right to apply and be considered for admission to a programme of higher education. It does not necessarily imply an automatic right of admission or entitlement to a place on a programme” (Bologna working group, 2005, p. 60).

However, the following questions, related to the compatibility of QF-EHEA and micro-credentials, might arise:

- How should micro-credentials relate to the QF-EHEA?
- Should micro-credentials be considered similar to short-cycle qualifications or programmes that fall outside the QF-EHEA degree structure? Or how do micro-credentials differ from them?
- How can the example of the short-cycle degree be applied to the micro-credentials?
- How, if at all, should the QF-EHEA as a meta-framework be used to address the following aspects of micro-credentials in higher education:
 - determining the range of ECTS credits assigned to micro-credentials;
 - formulating the descriptors of micro-credentials and their possible aims within higher education;
 - clarifying the overarching standards for micro-credentials that give access to conventional qualification?
- Should national qualifications frameworks include regulations in regard to micro-credentials offered by providers other than higher education institutions?

European Credit Transfer and Accumulation System (ECTS)

ECTS is an instrument that expresses the volume of learning based on defined learning outcomes²⁷ and their associated workload²⁸. ECTS credits are applicable to programmes regardless of mode of delivery, status of students (full-time, part-time) and learning context (formal, non-formal and informal) (European Commission, 2015).

ECTS credits are allocated to various educational components such as course units, work-based learning and work placements. The starting point for credit allocation is that the achievement of the intended learning outcomes equivalent to the workload of a full-time academic year equals 60 ECTS credits. Generally, the workload ranges from 1,500 to 1,800 hours for an academic year. This means that the typical workload of 25 to 30 hours corresponds to one ECTS credit with actual time for achievement of learning outcomes varying from one student to another (ibid., p. 10).

ECTS facilitates the transfer of credits²⁹ and thus, facilitates learners' mobility. There are several documents that facilitate the use of ECTS, namely the Course Catalogue, Learning Agreement, Transcript of Records, and the Work Placement Certificate.

ECTS credits may be awarded through assessment or recognition of the learning outcomes achieved, including those achieved in non-formal or informal learning contexts, and a learner can accumulate credits³⁰ either to obtain qualifications or to document personal achievements. The 2015 ECTS Users' Guide specifies that ECTS credits can be used in lifelong learning contexts (including continuing and professional education) applying the same principles for credit allocation, award, accumulation and transfer (p. 44).

²⁷ "Learning outcomes are statements of what the individual knows, understands and is able to do on completion of a learning process" (European Commission, 2015, p.11).

²⁸ "Workload is an estimation of the time the individual typically needs to complete all learning activities such as lectures, seminars, projects, practical work, work placements and individual study required to achieve the defined learning outcomes in formal learning environments" (Ibid., 2015, p.11).

²⁹ "Transfer of credits is the process of having credits awarded in one context (programme, institution) recognised in another formal context for the purpose of obtaining a qualification." (European Commission, 2015, p.12).

³⁰ "Accumulation of credits in ECTS is the process of collecting credits awarded for achieving the learning outcomes of educational components in formal contexts and for other learning activities carried out in informal and non-formal contexts." (ibid., 2015, p.11).

Like the allocation of ECTS credits to parts of study programmes leading to a conventional qualification, credits allocated for open learning and other modes of lifelong learning are based on the workload typically needed to achieve the defined learning outcomes. To facilitate transition between different modes of learning, recognition, and transfer, providers of all ‘formally’ quality assured higher education should make use of ECTS³¹ (ibid., p. 44). Thus, “ [c]redits awarded for all forms of higher education, including continuing and professional education, may be recognised and accumulated towards a qualification or not, depending on the desire of the student and/or the requirements for the award of the qualification.” (ibid., p. 46).

Regarding the allocation of ECTS credits to qualifications or programmes, the 2015 ECTS Users’ Guide specifies that it should be done in accordance with national legislation and practice. In addition, it assigns to national authorities the responsibility to decide which institutions have the right to award ECTS credits (p. 66). These specifications about the use of ECTS are important as they imply that micro-credentials can and should be allocated ECTS credits if they are provided by the institutions to which a national authority has given the right to do so.

In case legal restrictions prevent providers, which are not formally recognised educational institutions from awarding ECTS credits, it may still be advisable for them to make indirect reference to ECTS credits, if that is legally accepted (e-Valuate consortium, 2019). ‘KIRON credit points’ are a case in point. Kiron is a German non-governmental organisation that offers a study programme based on MOOCs to refugees. In case these learners continue their studies in one of Kiron’s partner universities, they can get exemptions for up to 60 ECTS credits (Suter and Rampelt, 2017).

The 2015 ECTS Users’ Guide explains that a study programme may comprise several educational components and when these have a regular size (e.g., 5, 10, 15) they are usually called ‘modules’ (p. 25). The guide further explains how the modularised programmes may be used and how the institutions may promote collaboration across subjects and faculties by establishing the minimum number of credits for a component. In addition, it suggests that a flexible programme structure is essential for the learners to be able to co-create their personal learning pathways (p. 25). These recommendations regarding modularised programmes and allocation of ECTS credits could be applicable for micro-credentials as well, considering that they can be part of a module or even equivalent to one. There are several proposals for an optimal workload and ECTS credit range for a micro-credential. For example, the European MOOC Consortium proposed the range from 4 to 6 ECTS and the e-SLP project consortium suggested the range of 5 to 30 ECTS for a short learning programme.

However, the following questions, linked to the use of ECTS in the context of micro-credentials, might arise:

- What would be the limitations for applying ECTS to micro-credentials, if any? How can they be addressed?
- Should the ECTS Users’ Guide provide more detailed guidelines regarding micro-credentials? If yes, what kind? Could these be included in an annex or explanatory note?
- Should the stackability aspect of micro-credentials be addressed in the ECTS Users’ Guide? If yes, how could it be addressed?
- Should the ECTS Users’ Guide provide a set of recommendations for the micro-credential providers regarding the information they should make available to facilitate recognition? If yes, what should these recommendations include?

³¹ There are countries in EHEA that refer to measures other than ECTS, namely the Flemish Community of Belgium and the United Kingdom (England, Wales and Northern Ireland). For example, the United Kingdom system is based only on learning outcomes for the allocation of credits and does not consider the required student workload (Bologna Process Implementation Report, 2018, p. 102).

3.2 Recognition

Lisbon Recognition Convention (LRC)

Recognition is a vital prerequisite for further development and expansion of micro-credentials. Recognition has various facets: recognition by the higher education institutions as part of a study programme or for further progression of studies; recognition by the employers and employer associations for recruitment or career advancement purposes; or a general cultural recognition (appreciation) in society of this form of education, which is equally vital for the further development of micro-credentials.

Academic recognition is the recognition of qualifications for access to a study programme or for exemption from parts of a study programme offered by an accredited higher education institution. The LRC is the main international convention stipulating regulations for academic recognition in the EHEA. It covers recognition of qualifications giving access to higher education, periods of study and higher education qualifications³². The Convention indicates that the recognition procedure always depends on the scope for which it is sought.

There are several sections in the LRC that imply that micro-credentials offered by accredited higher education institutions would fall within its scope:

- Section I – Definitions reads that a “[h]igher education qualification” is “[a]ny degree, diploma or other certificate issued by a competent authority attesting the successful completion of a higher education programme” (p. 3).
- Article IV stipulates that “[e]ach Party shall recognise the qualifications issued by other Parties meeting the general requirements for access to higher education in those Parties for the purpose of access to programmes belonging to its higher education system, unless a substantial difference can be shown between the general requirements for access in the Party in which the qualification was obtained and in the Party in which recognition of the qualification is sought.” (p. 6).
- Article V referring to the recognition of periods of study states that “[e]ach Party shall recognise periods of study completed within the framework of a higher education programme in another Party. This recognition shall comprise such periods of study towards the completion of a higher education programme in the Party in which recognition is sought, unless substantial differences can be shown between the periods of study completed in another Party and the part of the higher education programme which they would replace in the Party in which recognition is sought.” (p. 7).

The applicability of the LRC to micro-credentials implies that the recognition authorities, such as higher education institutions and ENIC/NARIC centres, would need to have quality assured processes and mechanisms for their recognition. When the micro-credential is awarded by an accredited higher education institution, and the quality, the workload, the level and the learning outcomes are certified, it undergoes the usual assessment procedure of the academic recognition.

Witthaus et al. (2016) found that higher education institutions usually recognise open learning such as MOOCs in two ways:

1. exemption from an entrance exam to higher education programmes for open learners
2. opportunity for registered students to earn credits towards a higher education qualification through open learning offers from institutions other than their home institutions (p. 37).

³² It is important to keep in mind that professional recognition and the general cultural recognition are important factors in promoting micro-credentials, even if in this report the focus is mainly on academic recognition due to the focus of LRC. For more information about the recognition of regulated professions, for example, see the European Commission and European Parliament’ 2007 Directive on Recognition of Professional Qualifications.

The same study explains that regarding learning outcomes obtained through MOOCs, there are three categories of recognition practices in higher education institutions:

1. “Higher education institutions’ courses turned open³³: recognition for own registered students,
2. Recognition of MOOC credentials allowing entry into higher education,
3. Recognition for registered students who successfully complete externally provided MOOCs.” (ibid., p. 37).

The PARADIGMS project proposed seven criteria for the evaluation of alternative learning experiences, with a special focus on Massive Open Online Courses (MOOCs), that can be used as a reference also in the case of micro-credentials (see Annex 1). Recognition of prior learning and experience is a relevant recognition method for micro-credentials that are obtained outside the formal education. The 2015 ECTS Users’ Guide points out that “[h]igher education institutions should be competent to award credits for learning outcomes acquired outside the formal learning context through work experience, voluntary work, student participation, independent study, provided that these learning outcomes satisfy the requirements of their qualifications or components. The recognition of the learning outcomes gained through non-formal and informal learning should be automatically followed by the award of the same number of ECTS credits attached to the corresponding part of the formal programme.” It further explains that “As with formal education, the award of credits is preceded by an assessment to verify the achievement of learning outcomes. The assessment methods and criteria should be constructed to measure the achievement of the required learning outcomes at the appropriate level, without reference to specific learning activities or workload.” (p. 46).

In terms of recognition procedures, the following questions arise:

- Do micro-credentials, as they are defined in the context of the MICROBOL project, fall under the provision of the Lisbon Recognition Convention? To what extent do they fall in its definition of qualifications?
- To what extent are the existing frameworks for recognition applicable to micro-credentials? What modifications are needed, if any?
- Are the existing recommendations and guidance on how to document lifelong learning/open education experiences clear for the purpose of credit accumulation and transfer in the context of micro-credentials? If not, how should the recommendations be adjusted to address micro-credentials?
- Should the existing procedures for recognition of prior learning, including non-formal and informal learning be used in the context of micro-credentials? What are the pros and cons?
- How would ensuring integration with the European Student Card Initiative and the Digitally Signed Credentials of the new Europass contribute to smooth recognition of micro-credentials?

The Diploma Supplement

The Diploma Supplement is a tool developed by the Council of Europe, European Commission and UNESCO, and its latest version was endorsed by the EHEA Ministers for higher education in Paris in 2018. The Diploma Supplement has an important role in facilitating the implementation of the LRC.

The explanatory notes of the Diploma Supplement indicate that it is a “tool for graduates to ensure that their degrees are recognised by higher education institutions, public authorities and employers in their home countries and abroad. The Diploma Supplement should build on and include the use of common transparency tools such as learning outcomes, ECTS and how the degrees correspond to the national qualification framework(s) and external national quality assurance and/or accreditation.” (Bologna Process, 2018a, p. 4) Further, the Diploma Supplement “is designed to provide a description of the nature, level, context, content and status of the studies that were pursued and successfully completed by the individual named on the original qualification to which this supplement is appended.” (ibid., p. 6)

³³ This means that the “students already registered on a programme at a higher education institution may be invited or required to do a MOOC provided by their “home” institution or a specified partner institution. The credits obtained from the MOOC will be recognised as part of the

credentials they receive for the total programme." (Witthaus et al., 2016).

In addition, one of the founding principles of the Diploma Supplement is that it is a “flexible, non-prescriptive tool, capable of adaptation to local needs”, meaning that the Diploma Supplement should allow a transparent documentation of micro-credentials that could eventually accumulate into larger credentials or could be part of a portfolio. (ibid., p. 4)

As discussed in the beginning of the report, some micro-credential definitions focus on the credential awarded at the completion of the learning experience. Therefore, the quality of documentation (the credential) provided to the learner and the information it conveys are one area of concern. To address this, the OEPass project has proposed a Learning Passport³⁴ and the MicroHE project developed the Micro-Credential Metadata Standard draft³⁵. According to these project consortiums, these tools facilitate the recognition and transferability of non-traditional learning experiences and exchange of recognition data in Europe. Both tools have been developed and modelled on the Diploma Supplement and represent a more detailed supplement for credentials (see Annex 5).

When discussing the Diploma Supplement and its applicability to micro-credentials, the following questions arise:

- Is the Diploma Supplement detailed enough to facilitate the recognition of micro-credentials? If not, what is missing?
- Should there be a specific, more detailed supplement for micro-credentials that is comparable to the Diploma Supplement (such as the proposals made by the projects discussed above)? How could such a supplement look like?
- Should micro-credentials that are part of a conventional study programme be highlighted in the Diploma Supplement issued for a graduate?

3.3 Quality assurance

The Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG)

The ESG were adopted in 2005 and revised in 2015. The document provides a set of standards³⁶ and guidelines³⁷ for internal quality assurance within higher education institutions, for external quality assurance of higher education and for internal quality assurance within external quality assurance agencies. The ESG contribute to the development of a common understanding of quality assurance for learning and teaching across borders and among all stakeholders. In context of the EHEA, the ESG along with other EHEA tools contribute to promoting transparency and mutual trust in higher education.

The ESG state that their focus is on “quality assurance related to learning and teaching in higher education, including the learning environment and relevant links to research and innovation.” They “apply to all higher education offered in the EHEA regardless of the mode of study or place of delivery.” (ESG, 2015, p. 7). This means that when micro-credentials are part of higher education, they should be covered by quality assurance processes in line with the ESG regardless of whether they are credit-bearing or not.

³⁴ <https://oepass.eu/outputs/learningpassport/>

³⁵ https://github.com/MicroCredentials/MicroHE/blob/master/meta_data_standard_draft.md

³⁶ “The standards set out agreed and accepted practice for quality assurance in higher education in the EHEA and should, therefore, be taken account of and adhered to by those concerned, in all types of higher education provision.” (ESG, 2015, p. 9).

³⁷ “The guidelines explain why the standard is important and describe how standards might be implemented. They set out good practice in the relevant area for consideration by the actors involved in quality assurance. Implementation will vary depending on different contexts.” (ESG, 2015, p. 9).

The ESG are not standards for quality nor do they prescribe how to implement quality assurance processes. The implementation of the ESG varies among different countries, agencies and institutions, depending on how they are interpreted and applied. The primary responsibility for the quality of provision lies with the higher education institutions, while the quality assurance agencies' role is to support higher education institutions in developing policies and processes for quality assurance and to ensure the public and stakeholders about their effectiveness (ENQA et al., 2020).

Translated to the context of micro-credentials, this division of tasks firmly places responsibility for assuring the quality of provision with the education providers. They are expected to put in place quality assurance processes corresponding to the expectations laid down in Part 1 of the ESG, also for any micro-credentials they provide. It is the responsibility of the institution to also "consistently apply pre-defined and published regulations covering all phases of the student "life cycle", [...] e.g. certification." (standard 1.4, p. 13). This responds to the need to assure the quality of certification received by a learner, which at times is referred to when discussing quality assurance of micro-credentials. This matter is further addressed in section 3.2 as part of the discussion on the Diploma Supplement.

Whether and how micro-credentials are addressed by external quality assurance, however, varies. In higher education systems where the focus of external quality assurance is on institutional level, it typically focuses on assessing the effectiveness of institutional quality assurance systems, and these institutional systems would be expected to cover all higher education provision of an institution, including micro-credentials. When external quality assurance focuses on one study programme at a time, including consideration for contents of study and modes of delivery, micro-credentials will most likely not be covered by any external quality assurance, unless they are offered as part of a larger study programme.

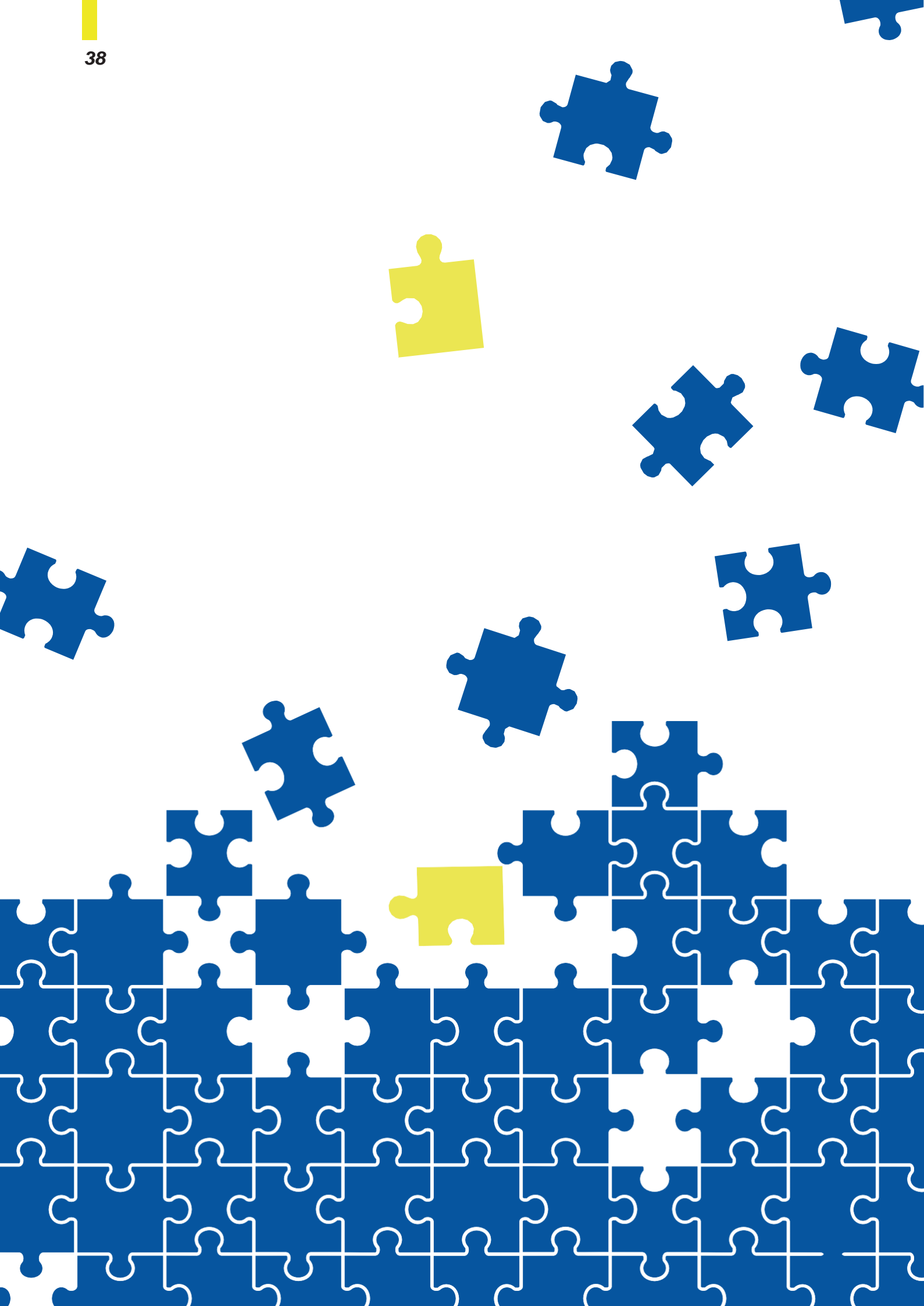
Nevertheless, considering that a learner can potentially use the credential towards a larger qualification or to earn credits towards a conventional qualification, it is reasonable to use the same quality assurance principles across the board in higher education as suggested by the ESG.

There are, however, additional aspects for the provision of online micro-credentials that need to be carefully considered. In this regard, the European Association for Quality Assurance in Higher Education (ENQA) report on the quality assurance of e-learning provision confirms that the ESG standards are applicable to e-learning. At the same time, it provides additional considerations and aspects to examine when developing quality assurance procedures for it. In addition, the report demonstrates the key role of internal quality assurance and how important it is for it to adapt to different modes and types of higher education delivery (Huertas et al., 2018).

Another aspect to be considered in view of diversity of micro-credential providers is that the ESG refer to higher education institutions as key actors for assuring the quality of their provision. In many higher education systems this is reflected in the remit of external quality assurance as well. This leaves out other potential providers of micro-credentials and does not determine how their quality is assured, whether by the provider or by external quality assurance.

Questions arising related to quality assurance of micro-credentials:

- What should be the role of external quality assurance in assuring the quality of micro-credentials? Should it be different depending on the provider? If so, how?
- Are there any specificities in external quality assurance of micro-credentials that would conflict with the expectations of the ESG? Which would they be?
- To what extent are the ESG standards on internal and external quality assurance applicable to all the providers (besides higher education institutions)? What are the limitations of applying the ESG for providers other than higher education institutions?
- How could quality assurance increase the trust in higher education in view of micro-credentials?
- Are there any specificities of internal quality assurance of micro-credentials that are not covered by the Part 1 of the ESG? If yes, what are they?
- Would a report on micro-credentials similar to ENQA's on quality assurance of e-learning be useful or needed? If yes, which are the aspects of the ESG where guidance is required?



4

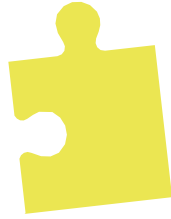
Conclusion

Micro-credentials come in diverse formats and are offered by various providers. This forms part of their strength and allows for the development of a rich and competitive micro-credential market. Strict standards or too much regulation risk limiting the capacity for innovation that is often associated with micro-credentials. Therefore, the aim for any European framework for micro-credentials should be to increase the clarity and transparency, which currently seem to be lacking, while leaving room for diversity and creativity. The initiatives outside Europe discussed in this report present interesting cases which may serve as inspiration either for the EHEA as a whole or individual higher education systems within EHEA.

The overarching purpose of the MICROBOL project is to examine how the Bologna Process and the EHEA are to address micro-credentials. Parallel to the MICROBOL project the European Commission is working towards a European Approach for Micro-credentials for the European Education Area, which will cover all education sectors. To avoid confusion or additional bureaucracy and to ensure synergies, a continued dialogue between these two parallel processes will be vital.

Micro-credentials have great potential for complementing conventional qualifications as part of lifelong learning and continuous professional education, and as pre- and post-graduate education. Various studies referred to in this report show that higher education institutions are one of the key providers of micro-credentials and thus drivers of innovation in this area. However, to what extent and on which level they engage in the provision of micro-credentials varies greatly from one higher education system and institution to another. This depends on the division of tasks in the system, on the one hand, and on the institutional missions and profiles, on the other hand. When discussing how EHEA tools address micro-credentials it is important to decide whether any of the tools, networks and tools are meant to cover all types and providers of micro-credentials or only those provided by higher education institutions.

Each of the EHEA tools serves different purposes and their appropriate use and interpretation is vital for their suitability for micro-credentials. They are also strongly interlinked and build on each other. For example, what is often discussed under the term transparency and quality assurance may in fact be dependent on the ECTS or on how the qualification framework is defined and implemented. This is particularly visible in section 2.3 of this report, which discusses issues such as the number of ECTS credits, qualification levels, indicative hours of learning, content, assessment practices, and learning outcomes. The use of indicators of educational quality. Therefore, the interlinkages of the tools and networks are crucial for the next stages of the project. This project is answering the question: How can the EHEA tools and networks be used to support the development of micro-credentials?



5 Annexes

Annex 1: Selected European projects

In response to the emerging challenges and limitations related to micro-credentials offer and use, a number of European projects have addressed micro-credentials in the past.

New Paradigms in Recognition (PARADIGMS)³⁸

The PARADIGMS project focused on exploring the developments regarding the implementation of automatic recognition and the recognition of experiences gained through new forms of learning.

After examining the current automatic recognition systems in the EHEA, it developed and tested a set of guidelines for the ENIC-NARIC centres to support and apply automatic recognition in their national setting. It examined the existing good practices in automatic recognition and proposed the following four models of automatic recognition:

1. legal bilateral and multilateral agreements, which arrange for the automatic recognition between two or more countries;
2. a legally binding unilateral list of degrees, which determines which qualifications are automatically recognized by that country;
3. non-legal bilateral and multilateral agreements, which are non-legal accords between countries to automatically recognize qualifications;
4. 'de facto' automatic recognition, which is a unilateral practice of automatic recognition based on a set of procedures without a formal or legal agreement.

In addition, the project consortium proposed a set of recommendations to support implementation of automatic recognition.

PARADIGMS also formulated recommendations to assess alternative learning experiences, with a special focus on Massive Open Online Courses (MOOCs), Small Private Online Courses (SPOCs) and in-company training programmes. It proposed the following seven criteria that should be taken into account when assessing MOOCs: quality of the study programme; verification of the certificate; level of the study programme; learning outcomes; workload; the way study results are tested; and identification of the participant.

Evaluating e-learning for academic recognition (e-VALUE)³⁹

The e-VALUE project provided an overview of the current state of play regarding online learning, notably MOOCs and SPOCs. It developed a Practitioner's Guide for recognition of e-learning and a Students Guide to e-learning. The practitioner's guide aims to familiarise recognition professionals with e-learning and support them in taking an informed recognition decision within reasonable time limits. The procedure is based on the seven criteria developed within PARADIGMS project listed above.

³⁸ <https://www.nuffic.nl/en/subjects/paradigms/>

³⁹ <https://www.nuffic.nl/en/subjects/e-value/>

The students guide to e-learning aims to support students in: understanding what e-learning is in general; learning how to select an online course; getting informed about the recognition of e-learning and the role of student boards. The guide explains how student boards operate in guiding and supporting students who seek recognition of e-learning certificates, or in bringing the issue of recognition of e-learning certificates to the attention of higher education institution boards.

European Short Learning Programmes (E-SLP)⁴⁰

The E-SLP project focusses on short learning programs (SLP) or short degree programs for continuous professional development and lifelong learning on a European level. The project investigated the status of SLPs within European higher education system, looked into the matters of accreditation, quality and recognition of SLPs and defined their main characteristics as follows:

- European Qualification Framework (EQF) level 4 to 8 (ranging from foundation to doctoral level);
- Study load between 5 to 30 ECTS;
- Focus on specific needs of society and labour market;
- Online and blended format;
- Target groups: non-traditional learners and adult learners;
- Relation to and recognition as part of formal degrees required (building blocks).

Open Education Passport (OEPass)

The OEPass project focused on improving the portability, transferability and recognition of open learning by developing a standard format for describing open education and virtual mobility experiences in terms of ECTS, namely the “Learning Passport”⁴¹. The Learning Passport addresses common criticisms of open education, mainly those referring to student assessment and identity; it is scalable to hundreds or thousands of students through automatic issuing and verification of certificates; and can capture a wide range of non-formal and formal open education experiences.

The project defined a credential as “a statement awarded from one party to another describing the latter’s qualities.” (Camilleri and Rampelt, 2018, p. 6) It also proposed a quality system that analyses the quality credential in terms of recognition and portability. Camilleri and Rampelt (2018) suggest that a credential, as a document that demonstrates that the learner qualifies for something, has three aims: to act as a unit of account, as a means of exchange, and as a store of value. The more these aims are met by a credential, the higher the probability that it will be accepted by third parties. The authors also developed the following matrix that describes the fitness for purpose of the aims of a credential (pp. 9-10):

⁴⁰ <https://e-slp.eadtu.eu/>

⁴¹ <https://oepass.eu/outputs/learningpassport/>

	Quality of the Statement The statement should:	Quality of the Medium The medium should:
Distinct	<p>represent a specific, identifiable and measurable experience, skill or fact</p> <p>be attributable to a single, identifiable person</p>	<p>allow for the storage and display of the statement, as well as any and all associated metadata</p>
Authentic	<p>contain enough information to:</p> <p>verify when, where and by whom it was issued</p> <p>trace and reproduce the conditions under which it was issued</p> <p>be able to be issued for a limited period and be revocable</p>	<p>only allow an issuer to create a certificate</p> <p>not allow for any kind of tampering or editing</p> <p>be able to store or link to the information required to verify</p> <p>display its validity status</p>
Accessible	<p>be issued in a widely-spoken language or in an easy to read graphical format</p> <p>be issued in a standardised form, according to standardised processes</p>	<p>allow for a credential to be issued in a widely used and/or open format</p>
Exchangeable	<p>be modular, allowing for the credential to be subdivided into smaller credentials or stacked into larger credentials</p> <p>be convertible into other types of credentials</p>	<p>allow for relational links to be created between credentials</p> <p>allow for credentials to be created out of other credentials</p>
Portable	<p>be owned by the learner</p>	<p>allow for the user to physically possess the credential in a place of their choosing</p> <p>enable that the credential is easily shareable by the user</p>

MicroHE⁴²

The MicroHE project aims at supporting learning excellence in higher education through micro-credentials. For this purpose, the project intends to create a recognition framework for micro-credentials and proposes the idea of a credit/module supplement which would give detailed information about micro-credentials compatible with ECTS. This supplement would complement the existing European recognition and transparency instruments.

In order to facilitate the transfer and portability of micro-credentials, the MicroHE project developed a micro-credential Meta-data Standard⁴³ for recording ECTS based on the European Qualifications Framework (EQF) meta-data schema and ESCO data schema.

In addition, the project developed a “Credentials Clearinghouse” called Credentify⁴⁴ which is an online platform and database powered by a blockchain network across European universities. Credentify aims to provide comprehensive information about the qualification and credential, allow the identification of institutions involved, and verify whether an individual actually was awarded the qualification by an institution. Further, it would contain a repository of all credentials earned by an individual for purposes of accumulation and portability.

European Credit Clearinghouse for Opening up Education (ECCOE)⁴⁵

Building on the results of OEPass and MicroHE project, ECCOE project’s main aim is to develop a comprehensive set of quality descriptors to be used for credential documentation (i.e. classifications and typologies of properties such as the mode of study, methods of assessment, authentication means, grading schemes, etc.) applicable in as many EU countries as possible. It also plans to set up an online catalogue of over 60 disciplinary and transversal modules which have passed the selection criteria for cross-institution recognition, to design a system for technology-enabled credentials, and to create a Model Credit Recognition Agreement which would address the lack of trust towards an unfamiliar higher education institution.

42 <https://microcredentials.eu/>

43 https://github.com/MicroCredentials/MicroHE/blob/master/meta_data_standard_draft.md

44 <https://credentify.eu/>

45 <https://eccoe.eu/>

Annex 2: Examples of European higher education institutions offering alternative credentials

University	Courses	Level	Relation to HEIs	Delivery mode
Baden-Württemberg Cooperative State University (DHBW)	Language courses, Intercultural Communication Scientific writing	Bachelor level		Online Own platform
Dublin City University (DCU)	Fintech, Computing	Master level		FutureLearn
Tampere University		All levels. Open university offers it at bachelor's and master's degree levels while CPD offers for working professionals.		Own platform
Linnaeus University	Open courses that offer certificates.	They provide short programmes for which a specific number of ECTS is allocated and which are part of the regular syllabus for Lifelong Learning & Continuing Professional Development.		Canvas.net and Eliademy
International University of La Rioja (UNIR)		Titulos propios - 10 ECTS (250 hours, duration 4 months)		Own platform
Universidad Nacional de Educación a Distancia (UNED)	Own degrees, Open Teaching, Professional Update, Teaching Training, Professional Expert, Specialization, Modular, University Expert Title, Master's Degree, Distance Vocational Training, Life Long Learning courses, University extension courses	Unofficial certificate, diploma, degree, title. Varying between 5 and 60 ECTS	SLPs can be considered as part to a larger degree. A maximum of 15% of the ECs obtained in specific SLPs can be used to access higher education, depending on thematic area.	Mostly Online/ blended and scalable

Fundacio per a la Universitat Oberta de Cata- lunya	<p>Own degree/ Own training: master's degree, postgraduate, specialisation, seminars, online vocational training, professionalizing courses, master's degree, specialized diplomas</p> <p>Non-Official Titles:- Expert, university extension, Extended Study</p>	<p>Diploma or certificate</p> <p>Varying between < 1 and 60 ECTS</p>	<p>The system of specializations allows progressive access to the master certificate. Not in other cases.</p>	<p>100% online and Scalable</p>
The Open University UK	<p>Certificate in higher education, Higher national certificate</p>	<p>Certificate Level 4; 60 ECTS</p>	<p>The certificate of Higher Education is a recognised exit award in the UK framework. It can also be seen as a stepping stone to a formal Degree.</p>	<p>Online and Scalable FutureLearn</p>
Open Universiteit NL	<p>Certified Professional</p> <p>Programmes, Praktijkleergang,</p> <p>Focus programmes, Premasters.</p>	<p>Certificate or diploma Level 6-7</p> <p>Varying between 5 and 60 ECTS</p>	<p>Can often be added within a bachelor, MBA or provides access to a master</p>	<p>100% online or Blended and scalable</p>

Politecnico di Milano	<p>2 different offers:</p> <p>1. Possibility for students to subscribe to single courses, obtaining credits after assessment. It can be done in almost all the Italian universities. Students can use the acquired credits to enrol on full course degrees.</p> <p>2. Ongoing experimentation with open badges, used to promote innovative didactics practices.</p>	A student can subscribe to any single course and have the extra credits added to the Diploma Supplement.		<p>1. Not digital</p> <p>2. Bestr -Cineca</p>
Università Europea di Roma	Certificate of Specialisation Course for Credential Evaluator awarded by the Università Europea di Roma and the first micro-credential certified by CIMEA in the higher education sector, i.e. the Professional Certificate on Credential Evaluation	University certificate (12 ECTS), level 6/7	Italian Universities can award "diploma di perfezionamento", that is a form of micro-credential	<p>Online</p> <p>Own platform</p> <p>Micro-credential awarded in blockchain (on the Diplome application)</p>
University of Pavia	ECDL / Language Certification	Bachelor level		Own platform
Hellenic Open University	Lifelong learning Programmes, Short Learning Programmes	Certificate Level 4-7 3-15 ECTS, or no ECTS	Not easy to connect to formal education	65% not scalable
Vytauto Didžiojo universitetas (VDU)	It offers short courses with credits in languages, e-learning technologies	Bachelor, Master's, professional studies that are later potentially recognized towards Bachelor degree or professional studies.		Own platform

Annex 3: Examples of alternative credential criteria and quality standards

	Formal action	Formal and informal recommendations					
	New Zealand Qualifications Authority (2018)	Expert Panel for Review of Australian Qualifications Framework (2019)	New Paradigms in Recognition project (2018)	European MOOC Consortium (2019)	German Forum for Higher Education in Digital Age (2019)	US Council for Higher Education Accreditation (2019)	Rutgers School of Management and Labour Relations and Lumina Foundation (2019)
Intended learning outcomes	0	0	0	0	0	0	0
Qualifications	0	0	0	0	0	0	0
Verification / assessment	0	0	0	0	0	0	0
Workload	up to 40 credits	0	0	1 0 0 - 1 5 0 hours	1 0 0 - 1 5 0 hours / 3-5 ECTS)	0	
Verification of learner identity		0	0	0	0	0	
Accreditation / recognition				0	0	0	0
Employers' demand	0				0	0	0
Level			0	EQF level 6-7	EQF level 6-7	0	
Provider's capability	0		0			0	0
External or internal review	0	0			0		
Learners' demand	0				0	0	
Mission/ purpose	0	0				0	
Absence of significant weaknesses	0						
Accessibility and affordability							0

Labour market outcomes							0
Non-duplication	0						
Orientation						0	
Stackability							0
Transparency							0

Source: Kato et al., (2020); New Zealand Qualifications Authority (2019), Guidelines for applying for approval of a training scheme or a micro-credential; Expert Panel for the Review of the Australian Qualifications Framework (2019), Review of the Australian Qualifications Framework: Final Report; Nuffic (2018), Oops a MOOC! Dealing with eclectic learning in credential evaluation; European MOOC Consortium (2019), The European MOOC Consortium (EMC) launches a Common Microcredential Framework (CMF) to create portable credentials for lifelong learners; Rampelt, Orr and Knoth (2019), Bologna Digital 2020: White Paper on Digitalisation in the European Higher Education Area; van der Hijden (2019), Digitization of Credentials: Quality of Shorter-Term Educational Experiences; Van Noy, McKay and Michael (2019), Non-Degree Credential Quality: A Conceptual Framework to Guide Measurement.

Annex 4: Qualifications Framework for the European Higher Education Area (QF-EHEA)

	Learning outcomes	ECTS credits
Short cycle qualifications	<p>Qualifications that signify completion of the higher education short cycle are awarded to students who:</p> <ul style="list-style-type: none"> • have demonstrated knowledge and understanding in a field of study that builds upon general secondary education and is typically at a level supported by advanced textbooks; such knowledge provides an underpinning for a field of work or vocation, personal development, and further studies to complete the first cycle; • can apply their knowledge and understanding in occupational contexts; • have the ability to identify and use data to formulate responses to well-defined concrete and abstract problems; • can communicate about their understanding, skills and activities, with peers, supervisors and clients; • have the learning skills to undertake further studies with some autonomy. 	<p>Typically include 90-120 ECTS Credits</p>
First cycle qualification	<p>Qualifications that signify completion of the first cycle are awarded to students who:</p> <ul style="list-style-type: none"> • have demonstrated knowledge and understanding in a field of study that builds upon their general secondary education, and is typically at a level that, whilst supported by advanced textbooks, includes some aspects that will be informed by knowledge of the forefront of their field of study; • can apply their knowledge and understanding in a manner that indicates a professional approach to their work or vocation, and have competences typically demonstrated through devising and sustaining arguments and solving problems within their field of study; • have the ability to gather and interpret relevant data (usually within their field of study) to inform judgments that include reflection on relevant social, scientific or ethical issues; • can communicate information, ideas, problems and solutions to both specialist and non-specialist audiences; • have developed those learning skills that are necessary for them to continue 	<p>Typically include 180-240 ECTS Credits</p>

Second cycle qualification	<p>Qualifications that signify completion of the second cycle are awarded to students who:</p> <ul style="list-style-type: none"> • have demonstrated knowledge and understanding that is founded upon and extends and/or enhances that typically associated with the first cycle, and that provides a basis or opportunity for originality in developing and/or applying ideas, often within a research context; • can apply their knowledge and understanding, and problem solving abilities in new or unfamiliar environments within broader (or multidisciplinary) contexts related to their field of study; • have the ability to integrate knowledge and handle complexity, and formulate judgments with incomplete or limited information, but that include reflecting on social and ethical responsibilities linked to the application of their knowledge and judgments; • can communicate their conclusions, and the knowledge and rationale underpinning these, to specialist and non-specialist audiences clearly and unambiguously; • have the learning skills to allow them to continue to study in a manner that may be largely self-directed or autonomous. 	<p>Typically include 90-120 ECTS credits, with a minimum of 60 credits at the level of the 2nd cycle</p>
Third cycle qualification	<p>Qualifications that signify completion of the third cycle are awarded to students who:</p> <ul style="list-style-type: none"> • have demonstrated a systematic understanding of a field of study and mastery of the skills and methods of research associated with that field; • have demonstrated the ability to conceive, design, implement and adapt a substantial process of research with scholarly integrity; • have made a contribution through original research that extends the frontier of knowledge by developing a substantial body of work, some of which merits national or international refereed publication; • are capable of critical analysis, evaluation and synthesis of new and complex ideas; • can communicate with their peers, the larger scholarly community and with society in general about their areas of expertise; • can be expected to be able to promote, within academic and professional contexts, technological, social or cultural advancement in a knowledge based society. 	<p>Not specified</p>

Source: Paris Communiqué (2018)

Annex 5: Diploma Supplement, OEPSS Learning Passport and MicroHe Micro-Credential Meta-data Standard draft

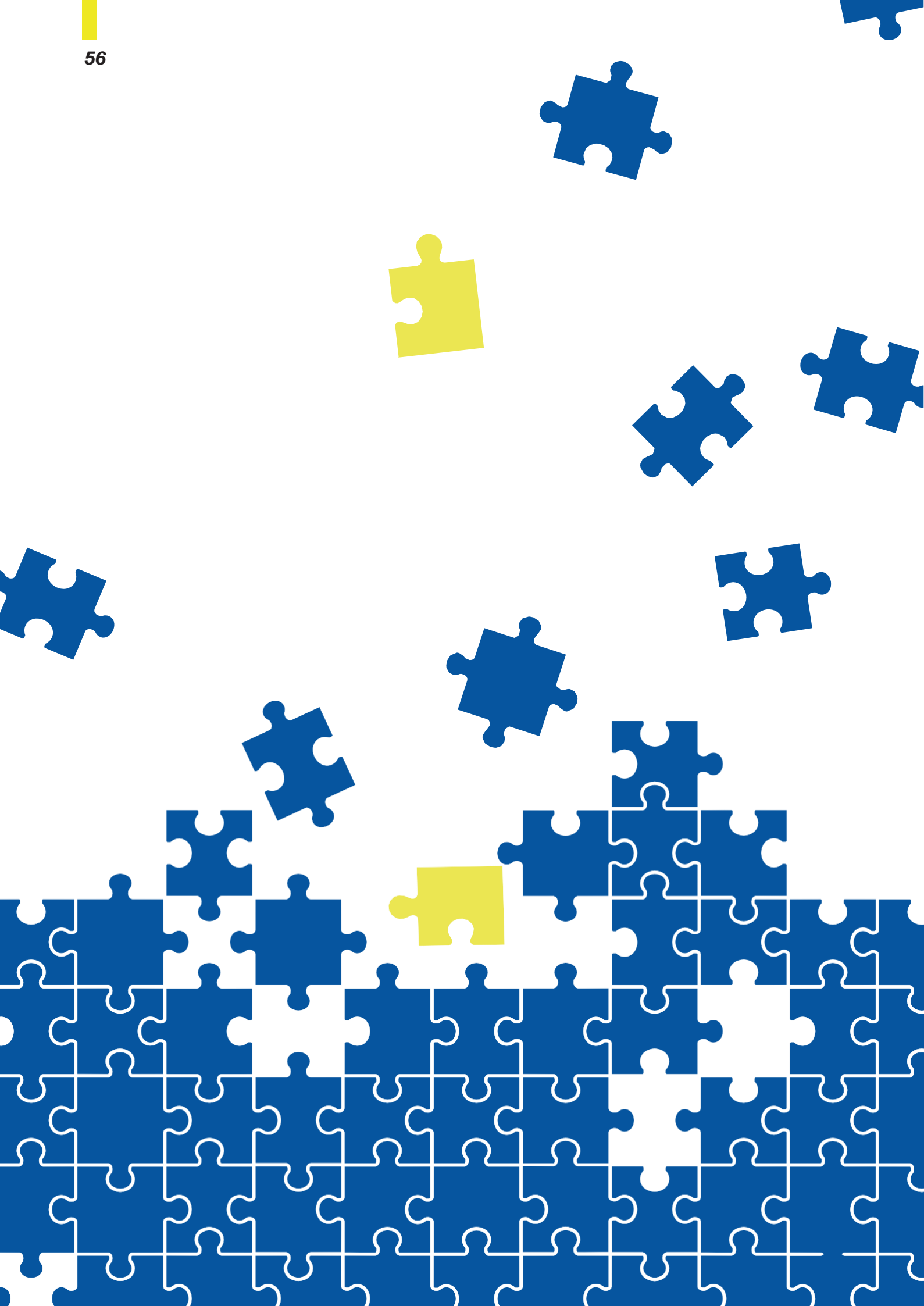
Diploma Supplement	OEPASS Learning Passport	MicroHE micro-Credential Meta-data Standard draft
1. INFORMATION IDENTIFYING THE HOLDER OF THE QUALIFICATION 1.1 Last name(s): 1.2 First name(s): 1.3 Date of birth (day/month/year): 1.4 Student identification number or code (if available):	1. INFORMATION IDENTIFYING THE EDUCATIONAL CREDENTIAL 1.1 The exact and official title of the credential if available 1.2 Identifier 1.3 Short and abstract description of the credential 1.4 Learning outcome description 1.5 Credential type 1.6 Subject 1.7 Ways to acquire the credential 1.8 Grading Scheme 1.9 Mode of study 1.10 Unit of workload 1.11 Assessment method 1.12 Level of learning 1.13 Number of Credit Points 1.14 Accreditation of the credential 1.15 Homepage of credential 1.16 Is the credential stackable?	1. INFORMATION IDENTIFYING THE AWARDING BODY 1.1 Owner (The organization owning rights over the qualification) 1.2 Provenance Agent (Organisation primarily responsible for establishing defining and managing the qualification and its curricula.) 1.3 Public key 1.4 Accreditation 1.5 Homepage

2. INFORMATION IDENTIFYING THE QUALIFICATION	2. INFORMATION IDENTIFYING THE HOLDER OF THE EDUCATIONAL CREDENTIAL AND THEIR ACCOMPLISHMENT	2. INFORMATION IDENTIFYING THE EDUCATIONAL CREDENTIAL
<p>2.1 Name of qualification and (if applicable) title conferred (in original language):</p> <p>2.2 Main field(s) of study for the qualification:</p> <p>2.3 Name and status of awarding institution (in original language):</p> <p>2.4 Name and status of institution (if different from 2.3) administering studies (in original language):</p> <p>2.5 Language(s) of instruction/examination:</p>	<p>2.1 Family name(s)</p> <p>2.2 Given name(s)</p> <p>2.3 Date of birth</p> <p>2.4 Student identification number or code, or public key</p> <p>2.5 Date of credential award</p> <p>2.6 Expiry date of credential</p> <p>2.7 Credits awarded</p>	<p>2.1 Identifier</p> <p>2.2 Title</p> <p>2.3 Alternative label</p> <p>2.4 Definition</p> <p>2.5 Learning outcome description</p> <p>2.5 Field</p> <p>2.6 EQF level</p> <p>2.7 NQF Level</p> <p>2.8 Number of Credit Points</p> <p>2.9 ECTS credit points</p> <p>2.10 Volume of learning</p> <p>2.11 Is partial qualification (Indicates whether a qualification is a full qualification or part of another qualification.)</p> <p>2.12 Ways to acquire</p> <p>2.13 Educational Credential Type</p> <p>2.14 Entry requirement</p> <p>2.15 Expiry period</p> <p>2.16 Learning outcome</p> <p>2.17 Related occupation</p> <p>2.18 Recognition</p> <p>2.19 Awarding body</p> <p>2.20 Awarding activity (Required to specify the awarding body/ competent authority and the Country/Region)</p> <p>2.21 Awarding method</p> <p>2.22 Grade scheme</p> <p>2.23 Mode of Study</p> <p>2.24 Assessment method</p> <p>2.25 Landing page</p>

3. INFORMATION ON THE LEVEL AND DURATION OF THE QUALIFICATION 3.1 Level of the qualification: 3.2 Official duration of programme in credits and/or years: 3.3 Access requirements(s)	3. SUPPLEMENTARY EVIDENCES 3.1 Link to individual credential evidence	3. INFORMATION IDENTIFYING THE CREDENTIAL TYPE 3.1 Credit / Token System 3.2 Credit System Title 3.3 Credit System Definition 3.4 Credit System Value 3.5 Credit System Issuer 3.6 Can consist of (Which other credential type/credit system can be used to build this credential type/credit system.) 3.7 Credit System Reference Number 3.8 Reference language
4. INFORMATION ON THE PROGRAMME COMPLETED AND THE RESULTS OBTAINED 4.1 Mode of study: 4.2 Programme learning outcomes: 4.3 Programme details, individual credits gained and grades/marks obtained: (if this information is available in an official transcript this should be used here) 4.4 Grading system and, if available, grade distribution table: 4.5 Overall classification of the qualification (in original language):	4. EVIDENCE 4.1 Date of formal publication 4.2 Update/modification date (if applicable) 4.3 Change note 4.4 Additional note	4. INFORMATION IDENTIFYING THE HOLDER OF THE EDUCATIONAL CREDENTIAL AND THEIR ACCOMPLISHMENT 4.1 Is made up of (Describes the (micro) qualifications which have been linked together to create the qualification.) 4.2 Expiry period 4.3 Holder's Name 4.4 Date of birth 4.5 Student ID 4.6 Grade 4.7 Credits awarded 4.8 Sub-Credentials contained 4.9 Unique Identifier 4.10 Supplementary evidence 4.11 Credential 4.12 Expiry Period

5. INFORMATION ON THE FUNCTION OF THE QUALIFICATION 5.1 Access to further study: 5.2 Access to a regulated profession (if applicable)		5. ADDITIONAL FIELDS 5.1 Release/publication date 5.2 Update/modification date 5.3 Change note 5.4 History note 5.5 Additional note 5.6 Status 5.7 Replaces 5.8 Replaced by 5.9 Publisher
6. ADDITIONAL INFORMATION 6.1 Additional information: 6.2 Further information sources:		
7. CERTIFICATION OF THE SUPPLEMENT 7.1 Date: 7.2 Signature: 7.3 Capacity: 7.4 Official stamp or seal:		
8. INFORMATION ON THE NATIONAL HIGHER EDUCATION SYSTEM		

Source: Bologna Process (2018a), OEPASS project (2018), MicroHE project (2019)



6

References

- Allen, I. and Seaman, J., 2015, Grade Level: Tracking Online Education in the United States (Babson Survey Research Group, Oakland).
- Almeda, V., Zuech, J., Utz, C., Higgins, G., Reynolds, R. and Baker, R. S., 2018, Comparing the Factors That Predict Completion and Grades Among For-Credit and Open/MOOC Students in Online Learning, *Online Learning*, 22(1), 1–18. doi:10.24059/olj.v22i1.1060.
- Barabas, C. and Schmidt, P., 2016, Transforming chaos into the promises and challenges of digital credentialing (s.l.: Rosveldt Institute). <http://philippschmidt.org/articles/2016-08-The-Promises-and-Challenges-of-Digital-Credentialing.pdf> (accessed 06/05/2020).
- Bologna Process, 2018a, Appendix IV: The Diploma Supplement Template. http://www.ehea.info/Upload/document/ministerial_declarations/EHEAParis2018_Communique_AppendixIV_952782.pdf (accessed 06/05/2020).
- Bologna Process, 2018b, Ministerial conference, Paris, 24-25 May 2018. http://www.ehea.info/Upload/document/ministerial_declarations/EHEAParis2018_Communique_final_952771.pdf (accessed 27/05/2020).
- Bologna Process, 2020, Draft 5 of the Rome Ministerial Communiqué. http://ehea.info/Upload/BFUG_HR_UA_71_9_Draft_5_Rome_Communique.pdf (accessed 27/07/2020).
- Bologna Working Group, 2005, A Framework for Qualifications of the European Higher Education Area. Bologna Working Group Report on Qualifications Frameworks (Copenhagen, Danish Ministry of Science, Technology and Innovation). http://www.ehea.info/media.ehea.info/file/WG_Frameworks_qualification/71/0/050218_QF_EHEA_580710.pdf (accessed 06/05/2020).
- Brimo, A. and Diaz, C., 2020, OpenCreds A lifelong learning micro-credentialing framework (Australia). <https://solutions.openlearning.com/opencreds/#report> (accessed 29/07/2020).
- Camilleri, A. F. and Rampelt, F., 2018, Concept paper on quality assurance on credentials. https://oepass.eu/wp-content/uploads/sites/22/2019/03/OEPass_O1A1-report_v5.pdf (accessed 04/05/2020).
- Chakroun, B. and Kevvy, J., 2018, Digital credentialing: Implications for the recognition of learning across borders. <http://www.groningendeclaration.org/wp-content/uploads/2019/05/UNESCO-Digital-credentialing-implications-for-the-recognition-of-learning-across-borders.pdf> (accessed 06/05/2020).
- Council of Europe, 1997, Convention on the Recognition of Qualifications concerning Higher Education in the European Region. http://www.ehea.info/media.ehea.info/file/Lisbon_Recognition_Convention/04/5/Lisbon_Recognition_Convention_579045.pdf (accessed 04/05/2020).
- Dakovic, G. and Loukkola, T., 2017, Learning & Teaching Paper #1, 2017 Thematic Peer Groups (Brussels, EUA). <https://eua.eu/downloads/publications/euas%20learning%20and%20teaching%20initiative%20-%20report%20from%20the%20thematic%20peer%20groups%20in%202017.pdf> (accessed 14/05/2020).
- DeLaski, K., 2019, The learner revolution: How colleges can thrive in a new skills and competencies marketplace. https://eddesignlab.org/wp-content/uploads/2019/03/TheLearnerRevolution_EducationDesignLab_2019.pdf (accessed 18/05/2020).

Dussarps, C., 2018, Les MOOC : quels enjeux pour valoriser une candidature à un emploi ? », Communication et organisation [En ligne], 53 | 2018, mis en ligne le 01 juin 2021, consulté le 04 août 2020. URL: <http://journals.openedition.org/communicationorganisation/6007>; DOI: <https://doi.org/10.4000/communication-organisation.6007> (accessed 18/05/2020).

ECIU, 2020, Towards a European micro-credential initiative. https://assets-global.website-files.com/562fb917aa38ca2e349b422e/5e8f1274009e48f02b9cd81a_ECIU%20University%20Towards%20a%20European%20Microcredentials%20Initiative%202020_fina.pdf (accessed 06/05/2020).

Educause, 2018, 7 things you should know about the Credential Transparency Description Language. <https://library.educause.edu/resources/2018/12/7-things-you-should-know-about-credential-transparency-description-language> (accessed 29/05/2020).

EDUCAUSE, 2019, 7 Things You Should Know About Digital Badges. <https://library.educause.edu/-/media/files/library/2019/7/eli7168.pdf> (accessed 14/05/2020).

EdX, Verified Certificates (n.d.). <https://www.edx.org/verified-certificate> (accessed 06/05/2020).

Ellis, L. E., Nunn, S. G. and Avella, J. T., 2016, Digital badges and micro-credentials: Historical overview, motivational aspects, issues, and challenges. In *Foundation of Digital Badges and Micro-Credentials* (pp. 3-21). (Springer, Cham).

E-SLP., 2019, About - E-SLP. <https://e-slp.eadtu.eu/> (accessed 13/05/2020).

European Association for Quality Assurance in Higher Education (ENQA), European University Association (EUA), European Association of Institutions in Higher Education (EURASHE) and European Students' Union., 2020, The ESG in the changing landscape of higher education. https://www.eua.eu/downloads/publications/e4_statement_the_esg_in_the_changing_landscape_of_higher_education.pdf (accessed 07/09/2020).

European Commission, 2008, The European Qualifications Framework for Lifelong Learning (EQF). http://ecompetences.eu/wp-content/uploads/2013/11/EQF_broch_2008_en.pdf (accessed 05/05/2020).

European Commission, 2015, ECTS Users' Guide (Publications Office of the European Commission). https://ec.europa.eu/education/ects/users-guide/docs/ects-users-guide_en.pdf (accessed 04/05/2020).

European Commission, 2018, Communication from the commission to the European Parliament, the Council, the European Economic and social Committee of the Regions on the Digital Education Action Plan. <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52018DC0022&from=EN> (accessed 04/05/2020).

European Commission, 2020, The European Skills Agenda. <https://ec.europa.eu/social/main.jsp?catId=1223> (accessed 30/08/2020).

European Commission/EACEA/Eurydice., 2018, The European Higher Education Area in 2018: Bologna Process Implementation Report (Luxembourg, Publications Office of the European Union). https://eacea.ec.europa.eu/national-policies/eurydice/content/european-higher-education-area-2018-bologna-process-implementation-report_en (accessed 27/05/2020).

European MOOC Consortium, 2019, the Common Microcredential Framework. https://eadtu.eu/documents/News/Press_release_European_MOOC_Consortium_launches_a_Common_Microcredential_Framework.pdf (accessed 29/05/2020).

European Union, 2020, Europass. <https://europa.eu/europass/en> (accessed 04/06/2020).

e-Valuate Consortium, 2019, Academic recognition of e-learning Recommendations for online learning providers. <https://www.nuffic.nl/en/subjects/e-valuate/> (accessed 13/05/2020).

Expert Panel for the Review of the Australian Qualifications Framework, 2019, Review of the Australian Qualifications Framework: Final Report (Department of Education, Canberra) https://docs.education.gov.au/system/files/doc/other/aqf_review_2019_0.pdf (accessed 29/05/2020).

Fain, P., 2018, On-Ramps and Off-Ramps: Alternative Credentials and Emerging Pathways Between Education and Work (Inside Higher Ed, Washington, DC).

Fong, J., Janzow, P. and Peck, K., 2016, Demographic Shifts in Educational Demand and the Rise of Alternative Credentials (Pearson, London; UPCEA, Washington, DC).

Friedman, S., 2019, Going Beyond the Digital Diploma (Campus Technology). <https://campustechnology.com/articles/2019/06/04/going-beyond-the-digital-diploma.aspx> (accessed 29/05/2020).

Gaebel, M. and Zhang, T., 2018, Trends 2018: Learning and Teaching in the European Higher Education Area (Brussels, EUA). <https://eua.eu/downloads/publications/trends-2018-learning-and-teaching-in-the-europe-an-higher-education-area.pdf> (accessed 18/05/2020).

Gallagher, S., 2018, Educational Credentials Come of Age: A Survey on the Use and Value of Educational Credentials in Hiring (Northeastern University, Boston).

Grech, A. and Camilleri, A. F., 2017 Blockchain in Education. Inamorato dos Santos, A. (ed.) EUR 28778 EN; doi:10.2760/60649

Hollands, F. and Kazi, A., 2019, Benefits and Costs of MOOC-Based Alternative Credentials: 2018-2019 Results from End-of-Program Surveys, Center for Benefit-Cost Studies of Education, Teachers College (Columbia University, New York).

Huertas, E., Biscan, I., Ejsing, C., Kerber, L., Kozłowska, L., Marcos Ortega, S., Lauri, L., Risse, M., Schörg, K. and Seppmann, G., 2018, Considerations for quality assurance of e-learning provision. Report from the ENQA Working Group VIII on Quality Assurance and e-learning. Occasional Papers, 26. <https://enqa.eu/indirme/Considerations%20for%20QA%20of%20e-learning%20provision.pdf> (accessed 02/06/2020).

International Council for Open and Distance Education, 2019, The Present and Future of Alternative Digital Credentials (ADCs), International Council for Open and Distance Education, Oslo. <https://static1.squarespace.com/static/5b99664675f9eea7a3ecee82/t/5cc69fb771c10b798657bf2f/1556520905468/ICDE-ADC+report-January+2019+%28002%29.pdf> (accessed 13/05/2020).

Jansen, D. and Schuur R., 2015, Institutional MOOC strategies in Europe (European Association of Distance Teaching Universities, Maastricht). Status Report Based on a Mapping Survey Conducted in October-December 2014. https://eadtu.eu/documents/Publications/OEenM/Institutional_MOOC_strategies_in_Europe.pdf (accessed 13/05/2020).

Kato, S., Galán-Muros, V. and Weko, T., 2020, The emergence of alternative credentials. <https://www.oecd-ilibrary.org/docserver/b741f39e-en.pdf?expires=1595933702&id=id&accname=guest&checksum=F2B3CF-8C655A25371434B58ABFD6F85C> (accessed 06/05/2020).

Kazin, C. J. and Clerkin, K. M., 2018, The potentials and limitations of microcredentials, s.l.: Service Members opportunity Colleges. http://supportsystem.livehelpnow.net/resources/23351/Potential%20and%20Limitations%20of%20Microcredentials%20FINAL_SEPT%202018.pdf (accessed 06/05/2020).

Kirsch, M. and Beernaert, Y., 2011, Short Cycle Higher Education in Europe. Level 5: The Missing Link (Brussels, EURASHE). https://www.eurashe.eu/library/modernising-phe/L5_report_SCHE_in_Europe_full_report_Jan2011.pdf (accessed 27/05/2020).

- Kirsch, M., Beernaert, Y. and Nørgaard S., 2003, Tertiary short cycle education in Europe – A comparative study (Brussels, EURASHE). https://www.eurashe.eu/library/modernising-phe/TSC_in_Europe_May2003.pdf (accessed 06/05/2020).
- Kolowich, S., 2013, The Professors Behind the MOOC Hype. <https://www.chronicle.com/article/The-Professors-Behind-the-MOOC/137905> (accessed 18/05/2020).
- Loukkola, T., Peterbauer, H. and Gover A., 2020, Exploring higher education indicators. <https://eua.eu/downloads/publications/indicators%20report.pdf> (accessed 29/05/2020).
- MicroHE Consortium, 2019, Challenges and Opportunities of Micro-Credentials in Europe. Briefing Paper on the Award, Recognition, Portability and Accreditation of Micro-Credentials. version 6.0. <https://microcredentials.eu/wp-content/uploads/sites/20/2019/12/WP3-Interviews-with-Key-Stakeholders-Decision-Makers-Over-all-Summary-Report.pdf> (accessed 06/05/2020).
- Naughtin, C., Reeson, A., Mason, C., Sanderson, T., Bratanova, A., Singh, J. and Hajkowicz, S., 2017, Employment data ecosystem: Equipping Australians with the information they need to navigate the future labour market.
- New Zealand Qualifications Authority, 2019a, Approval of micro-credentials (New Zealand Qualifications Authority, Wellington). <https://www.nzqa.govt.nz/providers-partners/approval-accreditation-and-registration/micro-credentials/#heading2-0> (accessed 13/05/2020).
- New Zealand Qualifications Authority, 2019b, Guidelines for applying for approval of a training scheme or a micro-credential (New Zealand Qualifications Authority, Wellington). <https://www.nzqa.govt.nz/assets/Providers-and-partners/Micro-credentials/guidelines-training-schemes-micro-credentials.pdf> (accessed 13/05/2020).
- Nuffic, 2018, Oops a MOOC! Dealing with eclectic learning in credential evaluation (Nuffic, The Hague). <https://www.nuffic.nl/en/publications/oops-mooc/> (accessed 13/05/2020).
- OECD, 2016, Massive Open Online Courses (MOOCs): Trends and Future Perspectives (OECD, Paris). [http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=EDU/CERI/CD/RD\(2016\)5&docLanguage=En](http://www.oecd.org/officialdocuments/publicdisplaydocumentpdf/?cote=EDU/CERI/CD/RD(2016)5&docLanguage=En). (accessed 13/05/2020).
- OECD, 2019, Survey of Adult Skills (PIAAC), <https://www.oecd.org/skills/piaac/> (accessed 18/05/2020).
- Oliver, B., 2019, Making micro-credentials work <https://www.assuringgraduatecapabilities.com/uploads/4/5/0/5/45053363/making-micro-credentials-work-oliver-deakin-2019.pdf> (accessed 18/05/2020).
- OpenupEd partners, 2014, OpenupEd Quality Label. <https://www.openuped.eu/quality-label/57-openuped-quality-label> (accessed 18/05/2020).
- Pickard, L., 2018, Analysis of 450 MOOC-Based Microcredentials Reveals Many Options But Little Consistency, <https://www.classcentral.com/report/moocs-microcredentials-analysis-2018/> (accessed 18/05/2020).
- Pickard, L., Shah, D. and De Simone, J., 2018, Mapping Micro-credentials Across MOOC Platforms (pp. 17–21). Presented at the 2018 Learning With MOOCs (LWMOOCs), IEEE.
- Rampelt, F., Orr, D. and A. Knoth, 2019, Bologna Digital 2020: White Paper on Digitalisation in the European Higher Education Area (Hochschulforum Digitalisierung, Berlin). https://hochschulforumdigitalisierung.de/sites/default/files/dateien/2019-05_White_Paper_Bologna_Digital_2020.pdf (accessed 18/05/2020).
- Shah, D., 2017, Class Central Learner Survey (2017): MOOC Users Highly Educated, Have Experienced Career Benefits, <https://www.classcentral.com/report/class-central-learner-survey-2017/> (accessed 18/05/2020).

Shah, D., 2018, By The Numbers: MOOCs in 2018 (Class Central) <https://www.classcentral.com/report/mooc-stats-2018/> (accessed 18/05/2020).

Shah, D., 2019, Online Degrees Slowdown: A Review of MOOC Stats and Trends in 2019, <https://www.classcentral.com/report/moocs-stats-and-trends-2019/> (accessed 13/05/2020).

Shah, D., 2020, Massive List of MOOC-based Microcredentials (Class Central) <https://www.classcentral.com/report/list-of-mooc-based-microcredentials/> (accessed 18/05/2020).

Standards and Guidelines for Quality Assurance in the European Higher Education Area (ESG), 2015, Brussels, Belgium.

Strada Education Network, Gallup and Lumina Foundation, 2019, Certified Value: When do Adults without Degrees Benefit from Earning Certificates and Certifications? (Strada Education Network, Indianapolis; Gallup, Washington, DC; Lumina Foundation, Indianapolis).

SURFnet, 2016, Whitepaper on Open Badges and Micro-credentials, SURFnet, Utrecht. <https://www.surf.nl/files/2019-06/Whitepaper-on-open-badges-en-micro-credentials.pdf> (accessed 13/05/2020).

Sursock, A., 2012, Quality assurance and the European transformational agenda. In European Higher Education at the Crossroads (pp. 247-265) (Springer, Dordrecht).

Suter, R. and Rampelt, F., 2017, Digital solutions for alternative routes into higher education – possibilities and challenges of digital teaching and learning scenarios for refugees: First results from the INTEGRAL project (Kiron Open Higher Education, Berlin).

Szalma, E. and Zarka, D., 2018, Identification of types of micro-credentials in higher education. https://oepass.eu/wp-content/uploads/sites/22/2019/03/OEPass_O1_A3_report_v4.pdf (accessed 04/05/2020).

The Chronicle of Higher Education, 2019, Career-Ready Education (The Chronicle of Higher Education, Washington, DC).

Van der Hijden, P., 2019, Digitization of Credentials: Quality of Shorter-Term Educational Experiences, Council for Higher Education Accreditation (Washington, DC) <https://files.eric.ed.gov/fulltext/ED597931.pdf> (accessed 29/05/2020).

Van Noy, M., McKay, H. and Michael, S., 2019, Non-Degree Credential Quality: A Conceptual Framework to Guide Measurement (Rutgers' School of Management and Labor Relations, New Jersey) https://smlr.rutgers.edu/sites/default/files/rutgerseerc_ndcquality_framework_full_paper_final.pdf (accessed 29/05/2020).

Wikipedia, 2020, Iwi. <https://en.wikipedia.org/wiki/Iwi> (accessed 04/08/2020)

Williams, P., 2019, Does competency-based education with blockchain signal a new mission for universities? Journal of Higher Education Policy and Management, 41(1), 104–117. doi:10.1080/1360080X.2018.1520491.

Witthaus, G. R., Santos, A. I. D., Childs, M., Tannhauser, A. C., Conole, G., Nkuyubwatsi, B. and Punie, Y., 2016, Validation of non-formal MOOC-based learning: An analysis of assessment and recognition practices in Europe (OpenCred).

Yuan, W. and Baker, R., 2018, Grit and Intention: Why Do Learners Complete MOOCs?, International Review of Research in Open & Distance Learning, 19(3), 20–42.

Acknowledgements

We wish to thank the experts of the MICROBOL project: Ann Katherine Isaacs, Anthony F. Camilleri, George Ubachs, Frederik De Decker and Peter van der Hijden for their advice and contribution on the report. We also thank the project partners and our colleague Michael Gaebel for their feedback and insights.

Special thanks go to the project coordinator, Magalie Soenen, for entrusting to us the role of authoring this report.

Elena Cirlan and Tia Loukkola
European University Association

