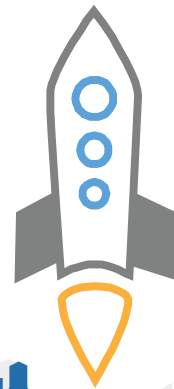




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## **RESULT 1.1c**

# **MICRO-CREDENTIALS IN EU AND GLOBAL**

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# MICRO-CREDENTIALS IN EU AND GLOBAL

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## EXECUTIVE SUMMARY

Like many other sectors, today's education and training system is heavily disrupted - digitization, new technologies and changing learning needs pose immense challenges, particularly to the higher education sector. In this context, the popularization of online education has strongly accelerated in the past few years, especially through new technology and formats like Massive Open Online Courses (MOOCs). MOOCs have successfully established themselves in the area of professional lifelong and corporate learning, while being a door-opener for new, innovative formats. Micro-credentials are rapidly emerging. They are widely described as a credential covering more than a single course but less than a full degree, while focusing on specific knowledge, skills or competences and being heavily market/society-driven. Answering the trends of stackability and modularity in higher education (unbundling and re-bundling of education "chunks"), micro-credentials are seen as a promising format in the context of lifelong learning and to overcome the existing skills gap.

The goal of this report is to provide an overview on the status quo of micro-credentials (both in EU and global), focusing on MOOC-based micro-credentials in particular. The first part of this report deals with an overview about the existing MOOC-based micro-credential offer. It is based on an existing dataset (Pickard, 2018), as well as a brief description of four selected initiatives and projects in the context of micro-credentials. The second part discusses the key findings from the empirical research conducted by the authors. It is based on a qualitative approach and semi-structured interviews with selected experts from the micro-credential ecosystem. The empirical research aims at answering the following research questions:

**RQ 1: How do experts perceive emerging trends and changing framework conditions within the education and training ecosystem?**

**RQ 2: How is the current offer of existing micro-credentials perceived by experts?**

**RQ 3: What kind of potentials do experts see in the format of micro-credentials?**

**RQ 4: What kind of barriers are micro-credentials currently facing according to experts?**

Findings have shown that learner needs are changing, as they increasingly demand flexible and personalized, on-demand, peer to peer learning possibilities, especially in the context of lifelong learning and continuous education. War for talents, skills gap, changing job market and roles, decreasing lifetime of knowledge and an increasing value of alternative (digital) credentials, especially in high-pressure and fast-changing industries like IT, are some key trends challenging or affecting the education and training ecosystem today. Even though micro-credentials have numerous benefits and potentials for companies, learners and universities, the level of awareness and understanding is still widely on a low level, espe-

cially within Europe. Chaotic terminologies, low standardization and limited stackability and transferability are key barriers that need to be overcome to make micro-credentials more valuable and recognized. If successful, micro-credentials can help to make education and training more aligned to the (fast-changing) labour market requirements, personalized and tailored to the individual needs and interests and provide a new, valuable education format in the context of lifelong learning. Here, micro-credentials can particularly address the increasing need for re-skilling (to keep one's level of employability or adapt to changing requirements, especially people with skills that are no-more marketable) and up-skilling (to create or improve career opportunities by upgrading and extending skills).

Still, the value of a fundamental, "360-degree" higher education provided by universities is emphasized heavily by the interviewed experts, teaching important versatile skills like problem solving or critical thinking. This solid formal education also enables graduates to adapt more easily to changing job requirements and new technology, which is evolving faster than ever before. The role of universities is not seen in the education of highly specialized workforce and serving as a training provider for the industry, especially since on-the-job training can only happen at the workplace. Therefore, micro-credentials are widely seen as a potential complementation of the existing higher education system and as a "follow-up tool" after the early academic stages (bachelor or master), rather than replacing them.



# 1. INTRODUCTION

Like many other sectors, today's education system is heavily disrupted - digitization, new technologies and changing learning needs pose immense challenges, particularly to the higher education sector. Universities are often criticized for insufficiently preparing their graduates for the demands and requirements of the labour market (while there is also a debate about whether the role of universities is to deliver highly specialized "work-ready" graduates for the industry instead of providing a solid fundamental "360-degree" education) and for reacting too slowly to new educational trends and changing learner needs.

Meanwhile, the popularization of online education has strongly accelerated in the last two decades, in great part thanks to the new opportunities brought by the development of information technology. As Siemens and Tittenberger (2009) noted, "the greater use of emerging technology can serve as an important bridging process between the traditional role of education and the not yet clearly defined future". MOOCs are seen as a prime example of such an emerging and disruptive technology within the area of online education. MOOCs are widely considered to be a door-opener to new trends in education and training, especially in the context of professional life-long learning and the target group of working people, who are often not able to return to university for a 2-3-year degree on-campus. Being characterized as flexible, open, self-directed, self-paced, highly interactive including peer learning, interdisciplinary and cost-reducing, MOOCs bear a huge potential to cater the increasing needs of learners. The increased integration of new didactical approaches and the possibility of data collection and analysis (learning analytics) also help to improve the learning experience and success.

The use of MOOCs has become increasingly established over the last few years, also in the company context of continuous employee education and training. Learners are using MOOCs to develop new skills and competences, in order to be prepared for future challenges and requirements in the fast-changing labour market or to improve their career opportunities. According to several studies, more than 50% of MOOC learners primarily aim at receiving new skills. A growing "bottom-up" movement by learners, who learn in their free time, is also observable. In 2018, already more than 100 million persons were learning with MOOCs, about 11,400 courses were provided by over 900 universities, while the online education market is valued at \$160 billion today and expected to grow to over \$270 billion by 2022.



**Universities:** disrupted by technology, often slow, outdated and not able to respond to educational trends and changing learner demands



**Companies:** suffering from skills gap, continuing corporate learning of workforce as a key challenge



**Learners:** increasing need for flexible, personalized, on-demand, continuous education possibilities

In this context, another recent trend stemming from (or largely built on) MOOCs are micro-credentials. Being widely described as a credential covering more than a single course but less than a full degree, focusing on specific knowledge, skills or competences while being heavily market/society-driven – they have been emerging rapidly over the last few years. Micro-credentials can be seen as an answer to the trend of stackability and modularity in higher education, when it comes to the unbundling and rebundling of education “chunks” or components, in which both employers and workforce will hopefully find increasing value in the near future. Micro-credentials are also seen as a promising format to address the existing skills gap and cater the increasing needs of today’s learners when it comes to flexible, personalized learning, available on-demand or just-in-time. Similar to MOOCs, especially for the target group of professional lifelong-learners and within the area of corporate learning, micro-credentials can serve as valuable new education format, complementing the traditional higher education degree system.

Despite the huge potential, several issues around micro-credentials remain largely unsolved, especially when it comes to accreditation, recognition, quality assurance and the currently low level of standardization and consistency among the existing offer. Even though several initiatives aim at overcoming those barriers (such as the EU-funded projects MicroHE or E-SLP and the Common Microcredential Framework by the European MOOC Consortium, briefly described in the next chapter), the topic of micro-credentials remains widely under-researched and lacks empirical evidence.

The goal of this report is to provide an overview on the status quo of micro-credentials (both in EU and global), focusing on MOOC-based micro-credentials in particular. The report is written in a concise, business-style and easy-to-read format on purpose, instead of a scientific paper. The report is divided into two major parts. The first one deals with an overview about the existing micro-credential offer and existing offers in the area of corporate-startup collaboration, based on the dataset by Laurie Pickard (2018), as well as describing four selected initiatives and projects in the context of micro-credentials. The second part focuses on a discussion of the key findings from the empirical research conducted by the authors, based on the following research questions:

**RQ 1: How do experts perceive emerging trends and changing framework conditions within the education and training ecosystem?**

**RQ 2: How is the current offer of existing micro-credentials perceived by experts?**

**RQ 3: What kind of potentials do experts see in the format of micro-credentials?**

**RQ 4: What kind of barriers are micro-credentials currently facing according to experts?**

The empirical part is based on a qualitative approach, where semi-structured interviews with experts from the micro-credential ecosystem have been conducted. The next chapter provides a detailed description of the methodology.

## 2. METHODOLOGY

The research methodology consists of a literature review and empirical research. The literature review is primarily based on the dataset of Laurie Pickard (2018), who mapped the existing MOOC-based micro-credential portfolio of five MOOC platforms - Coursera, edX, Udacity, FutureLearn and Kadenze.

Regarding the empirical part of the report, the authors used a qualitative approach, in order to answer the stated research questions. A qualitative research approach was selected due to its explorative nature and its ability to provide an in-depth insight. Furthermore, this type of research seeks to verbalize data for observing and interpreting it individually, which makes the process flexible and open for interpretation. Especially for studying complex phenomena and receiving a holistic dimension - as it is the case in the context of micro-credentials and the stated research questions - a qualitative approach is appropriate and useful. Data was collected through semi-structured interviews, as this method offers high flexibility and openness. The interviews were carried out via phone and/or skype, due to better accessibility and time and cost savings, as the experts were geographically dispersed around the globe. All interviews were carried out in English.

Eleven experts within three main fields were selected and interviewed, based on theoretical sampling:

1. **Higher education institutions**
2. **MOOC platforms**
3. **Companies**

Additionally: MOOC-aggregator, association of universities

A detailed interview list can be found in appendix 1. The interviewed experts were located in Germany, Netherlands, Italy, UK, USA and Mexico. The sampling method supports the exploratory nature of the research questions and allows to highlight new potential areas of interest. In addition, expert sampling is particularly helpful whenever empirical evidence is missing or limited, as it is in the case of micro-credentials.

On the one hand, many universities, companies and learners have a need for micro-credentials (even though they might not be aware of it yet), while several MOOC platforms (cooperating with companies and/or universities to create content and credentials) are already providing an approach to fill this needs gap. Therefore, the chosen approach allows to obtain data from both sides (needs and solutions), involving key players and stakeholders within the micro-credential ecosystem. In addition, the geographical dispersion of the selected experts allows a better generalization. The interview was structured into four areas, based on leading questions regarding emerging trends and framework conditions, perception

of the status quo, barriers & challenges and potentials & opportunities of micro-credentials. The following illustration provides an overview about the main questions of each area used for the interviews.

Emerging trends & framework conditions	Perception of status quo	Barriers & challenges	Potentials & opportunities
<ul style="list-style-type: none"> <li>•How do you perceive the changes in the area of learner needs and demands?</li> <li>•What trends do you see generally in the education and training market?</li> </ul>	<ul style="list-style-type: none"> <li>•How would you define a “microcredential”?</li> <li>•How do you perceive the current offer of MCs?</li> <li>•What kind of formats/approaches of microcredentials do you know?</li> </ul>	<ul style="list-style-type: none"> <li>•What barriers do you see in the current MC ecosystem?</li> <li>•How can those barriers be overcome?</li> <li>•How do you perceive the status-quo of the recognition of MCs by companies/HEIs?</li> <li>•How do you perceive the limitations of MCs, compared to traditional education formats?</li> </ul>	<ul style="list-style-type: none"> <li>•What kind of added values do you see for learners/companies/HEIs?</li> <li>•How do you perceive the potential of MCs for complementing traditional education/training formats and offers (in your organisation)?</li> <li>•What role do you think will microcredentials play in the education and training ecosystem in the next years?</li> </ul>

## 3. THE RISE OF MICRO-CREDENTIALS

### 3.1 DEFINITIONS AND MICRO-CREDENTIALIAL OVERVIEW

Not only in the context of MOOCs but also generally in today’s education environment, the rise of micro-credentials is a recent trend. Many different definitions, typologies and synonyms of the term micro-credential exist, such as “micro-degree”, “nanodegree”, “digital badge” or “alternative digital credential”, often used interchangeably and branded differently by the issuing institution. Pickard, Shah and De Simone (2018) for example define a micro-credential as “any credential that covers more than a single course but is less than a full degree”, focusing on the field of MOOC-based micro-credentials. Within another EU-funded project named E-SLP, the term “short learning programmes” is used instead of micro-credentials, defined 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”.



“any credential that covers more than a single course but is less than a full degree” (Pickard, Shah, & De Simone, 2018)



„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” (E-SLP, 2019)



Taking a closer look at MOOC-based micro-credentials in particular, Pickard, Shah and De Simone published an analysis of 450 micro-credentials offered on five MOOC platforms (Coursera, edX, Udacity, FutureLearn and Kadenze) in 2018. The majority of the offered micro-credentials by the five platforms is paid, with price ranges from a few hundred to a few thousand dollars. Learners can choose between payment for each course individually or pay upfront for the whole series, receiving a small discount. The two tables below illustrate the eleven different types of micro-credentials on the five MOOC platforms, including price range, duration in months and minimum/maximum effort per week. Pickard et. al conclude that the current offer of various micro-credentials lacks consistency and standardization, making it difficult to evaluate their significance and compare them, for both learners and employers.

Platform	Micro-credential name/type			
Coursera	Specialization, MasterTrack Certificate, Professional Certificate			
edX	XSeries, MicroMasters, Professional Certificate			
Udacity	Nanodegree			
FutureLearn	Program, Graduate Certificate, Graduate Diploma			
Kadenze	Program			
Micro-credential name/type	Price Range	Months	Lowest Min Effort/Week	Highest Max Effort/Week
Coursera MasterTrack	\$2,000 – \$3,474	4-6	4 hours	15 hours
Coursera Professional Certificate	\$406 – \$5,980	4-8	8 hours	10 hours
Coursera Specialization	\$27 – \$636	1-15	1 hour	40 hours
edX MicroMasters	\$536 – \$1,500	3-15	2 hours	20 hours
edX Professional Certificate	\$68 – \$2,340	1-15	1 hour	13 hours
edX XSeries	\$90 – \$594	2-10	1 hour	10 hours
FutureLearn Graduate Certificate	\$6,406 – \$11,613	6-12	Not given	Not given
FutureLearn Graduate Diploma	\$15,320 – \$19,689	12	Not given	Not given
FutureLearn Program	\$147 – \$1,685	2-12	2 hours	6 hours
Kadenze Program	\$300 – \$900	2-7	6 hours	12 hours
Udacity Nanodegree	\$199 – \$2,400	1-8	5 hours	15 hours

Source: Pickard et. al (2018)

The planned CORSHIP MOOC and micro-credential will be focusing on the topic of corporate entrepreneurship and how to improve the collaboration between startups and corporates (and academia). Therefore, the existing offer of micro-credentials in this context was researched. The table below provides an overview about the micro-credentials identified during this process. Even though there are several entrepreneurship micro-credentials available, none of them is focusing on corporate entrepreneurship, not

to mention startup-corporate collaboration. Also, no single MOOC was found during the desk research on this specific topic, even though there exist some on intrapreneurship (such as the one from BizMOOC offered on openHPI platform) and several MOOCs using misleading titles and in fact not providing content on corporate entrepreneurship. Despite the huge potential and needs for education and training programs in this increasingly important field, there is no open/online offer existing to-date.

Type	Title	University or institution, country	est. time to complete	Recom. eff/week	self-paced
<b>Coursera Specialization</b>	Social Entrepreneurship	Copenhagen Business School, Denmark	5 months	3 hours	no
<b>Coursera Master-Track</b>	Digital Marketing	University of Illinois, USA	7 months	15 hours	no
<b>Coursera Professional Certificate</b>	Innovation Management and Entrepreneurship	HEC Paris, France	4-10 months	10 hours	yes
<b>edX XSeries</b>	Business Principles and Entrepreneurial Thought	Babson College, USA	6 months	4-6 hours	yes
<b>edX Professional Certificate</b>	Entrepreneurial Mindset and Leadership	Babson College, USA	4 months	4-6 hours	yes
<b>edX Micro-masters</b>	Entrepreneurship	IIMB, India	6-11 months	4-6 hours	yes
<b>FutureLearn In-depth program</b>	Online Business Success	RMIT University, Australia	4 months	2 hours	yes
<b>Kadenze Program</b>	Money Matters for Creative Entrepreneurs	Columbus College of Art & Design, USA	12 months	none	no
<b>Udacity Nanodegree</b>	Become a Digital Marketer	Facebook, Google and more, USA	3 months	10 hours	no

Source: own table

A recent survey published by the Northeastern University’s Center for the Future of Higher Education and Talent Strategy in 2018 identified interesting findings relating to the future of educational credentials and their value and use in the workplace. Based on a survey of 750 HR leaders at US employers, several key findings have also been identified regarding micro-credentials:

- About 64% think that the need for continuous lifelong learning will demand higher levels of education and more credentials, 52% believe that most advanced degrees will be completed online in the future
- Skills-based or competency-based hiring gains significant interests and momentum

- A majority of 61% of HR leaders believe that online credentials are of equal quality to offline ones
- Awareness of non-degree micro-credentials is still relatively low but evolving rapidly
- Micro-credentials are seen as a supplement rather than substitute for traditional degrees
- Work-integrated learning and curriculum that is industry-aligned and employer validated are highly prioritized by employers as indicators for credential quality

Even though the perception might be different outside the US, the findings are important when it comes to measuring the status quo of micro-credentials and identify future trends and development.

## 3.2 EXISTING PROJECTS AND INITIATIVES

### 3.2.1 MicroHE & OEPASS

MicroHE is an Erasmus+ project which aims at supporting learning excellence through micro-credentials in higher education. Focusing on micro-credentials conferring a minimum of 5 ECTS from accredited and/or recognised institutions, MicroHE plans to measure the current state and trends and develop models for future impacts of micro-credentials, propose instruments (such as credit supplement) for transparency of credentials and build a prototype for a European credential repository.

The closely connected OEPASS project (also Erasmus+) focuses on improving the portability and recognition of open learning by developing a standard format for describing open education and virtual mobility experiences in terms of ECTS, namely “Learning Passport”. This should help to expand the European knowledge-base on the recognition of open learning.

### 3.2.2 European Short Learning Programmes (E-SLP) project

E-SLP is another Erasmus+ project focusing on short learning programs (SLP) or short degree programs for continuous professional development and lifelong learning on a European level. Results should include reports on status quo and positioning within the European higher education system, quality and recognition, guidelines, an online portal with SLP offerings, as well as policy recommendations. The consortium defined SLP along the following characteristics:

- European Qualification Framework (EQF) level 4 to 8 (foundation to doctoral level)
- Study time between 5 to 60 ECTS
- Relation to and recognition as part of formal degrees required (building blocks)
- Online and blended format
- Target groups of non-traditional learners and adult learners (work & study)
- Society and market driven

### 3.2.3 Common Microcredential Framework (CMF) by EMC

The European MOOC Consortium, consisting of FutureLearn, France Université Numérique (FUN), OpenupED, Miríadax and EduOpen, announced a Common Microcredential Framework in May 2019. The framework aims at creating standardization among the micro-credential offers by Europe's leading MOOC platforms and the universities within their networks. This should help universities to create a new kind of international and portable credential in the area of lifelong learning. Starting in the second half of 2019, all new micro-credentials will be created along the following criteria:

- Develop industry recognized skills endorsed by leading employers
- Designed to fit alongside work and other commitments
- 100-150 hours of study incl. summative assessment
- Robust summative assessment with ID verification
- EQF level 6 & 7 (bachelor or master)
- Recognised for credit directly OR as prior learning (4-6 ECTS)
- Transcript setting out learning outcomes, hours of study and level

### 3.2.4 Digital Credentials collaboration

Nine leading universities announced on 23 April 2019 that they have formed the Digital Credentials collaboration in order to create a trusted, distributed, and shared infrastructure standard for issuing, storing, displaying, and verifying academic credentials. The universities working on this effort include Delft University of Technology (The Netherlands), Harvard University (USA), the Hasso Plattner Institute (University of Potsdam, Germany), Massachusetts Institute of Technology (USA), Tecnológico de Monterrey (Mexico), TU Munich (Germany), UC Berkeley (USA), UC Irvine (USA), and the University of Toronto (Canada).

For learners, this technology will allow them to:

- Maintain a compelling and verifiable record of their lifelong learning achievements to share with employers
- Receive their credentials digitally and safely
- Own all of their credentials forever without having to ask/pay their institution for a transcript ever again
- Compile and curate credentials they receive from multiple educational institutions

For institutions, digital verifiable credentials enable them to:

- Keep and distribute learner records in a way that is easy, safe, and inexpensive
- Remove the risk of identity fraud
- Issue multiple credentials to a single learner easily, using the same streamlined process

## 4. KEY FINDINGS FROM EXPERT INTERVIEWS

The following section addresses the 19 main findings from the expert interviews conducted by the authors. The findings are divided into the four categories: emerging trends & framework conditions, status quo, barriers and potentials. This approach gives a comprehensive overview of the key issues within the current micro-credential ecosystem and the (possible) future role within the education and training ecosystem. In addition, experts were asked about the framework conditions, which heavily affect the rise of micro-credentials.



### Emerging trends & framework conditions

Learner needs and demands are changing  
Education and training market transforming rapidly



### Status quo of microcredentials

Chaotic status quo, low awareness and understanding  
Various common characteristics  
Role both standalone and part of degree  
Different approaches and didactics  
Different markets and target groups



### Barriers & challenges

Chaotic terminologies, low standardization, high variability  
Question of quality assurance  
Stackability and transferability  
Mistrust in online education and new assessment tech  
Soft skills online, learner decisions  
Limited time, internet access, payment options, growing paywall  
Universities too slow, insufficient resources



### Potentials & opportunities

Various benefits and potentials for universities, companies and learners  
Rather complementation than competition for university degrees  
Promising and important future role of micro-credentials

### 4.1 EMERGING TRENDS & FRAMEWORK CONDITIONS

#### Finding 1: Learner needs & demands are changing

Changing learner needs play a major role in the rise of new (digital) learning formats, such as micro-credentials. The interviewed experts note that learners increasingly demand lifelong learning possibilities and offers, especially due to the fast-changing technological environment and new/changing job roles and requirements. Re-skilling (to keep one’s level of employability or adapt to changing requirements), as well as up-skilling (to create or improve career opportunities) become increasingly important. Also, learners demand shorter education “chunks” or programs, especially the target group of professional lifelong-learners – working more than 40 hours a week, having family etc. – is often not able or willing to go back to university for a degree lasting 2-3 years. Especially the low flexibility in the traditional higher education system today is hindering this. Even though more and more employers start supporting additional learning by their employees also during work-time, many learners prefer to learn during their free time (self-driven learning, no time during working week). The shorter duration of micro-credentials also provides a clear, reachable goal that increases the motivation to finish and eventually go for something bigger later on. In addition, the following needs have been mentioned by several experts:

- **Flexibility:** learn at own pace (self-paced or frequent sessions, depending on whether interaction, community building and a fast response are demanded/expected), anytime, anywhere, on any device
- **Personalization:** individual learning paths, tailor-made education and training offers, constant feedback/learning data collection to improve learning experience
- **On-demand:** just-in time access to knowledge, skills and competences
- **Omni-channel:** program offerings before, during, after campus
- **Peer2peer learning:** having close exchange with other learners, share ideas, discuss problems and helping each other
- **Modularity & stackability:** unbundling larger qualifications/education programs into smaller ones, enabling learners to combine and re-bundle according to personal needs/interests (putting together own “education playlist”), have possibility to achieve something larger (degree) if wanted

## Finding 2: Education and training market transforming rapidly

Experts were also asked about their perception of how the education and training market evolves and named the following:

- **Changing job market & roles:** increasing need for re- and up-skilling of employees through digitization and automation (lifelong learning possibilities and offers)
- **Decreasing lifetime of knowledge:** fast-changing environment, especially through rapid technological developments and progress
- **Monopoly of knowledge by universities lost:** education becoming more open and provided on multiple, different channels (also leading to rapid growth of online education industry)
- **Skills gap as key challenge:** education system is not fully able to keep up with speed of technological changes, “gap” filled by alternative providers or companies themselves (e.g. Microsoft providing IT courses and credentials on Udacity)
- **War for talents:** especially younger generations (“millennials”) expect training and development programs at a company
- **Increasing offerings for specific target groups:** such as professionals or executives
- **Value of traditional degrees** (bachelor, master) decreasing in specific industries: especially in IT there is a high pressure and demand for coders, companies like Apple and Google forced to lower expectations and requirements of having a university degree (as long as applicants are able to code)
- **Traditional companies still value formal degree:** to have a “minimum threshold” of skills and competences for filtering applicants, but also due to the low awareness of the value of alternative (digital) credentials

- **Online testing of skills:** becoming more important through new technology (e.g. online procuring using AI), also increasingly used for recruiting purposes (e.g. online assessment centres)

In this context, micro-credentials are seen as a promising solution to address both changing learner needs and respond to upcoming trends, while preparing learners for the changing roles and requirements on the labour market.

## 4.2 PERCEPTION OF STATUS QUO

### Finding 3: Chaotic status quo, low awareness & understanding

The many different definitions, terminologies and synonyms existing for the term “micro-credentials” result in a lot of confusion and low understanding. Several experts noted that the term “micro-credential” could also be interpreted as a badge for a specific (or a series of) learning activity, element or a single course.

In addition, the awareness of micro-credentials is generally on a low level, especially among companies (HR) and universities (directors, strategy planners) this new format is still widely unknown. While universities are aware of digital trends and interested to step into digital, only a few already embrace new formats like micro-credentials. Those that do are successfully increasing the learning experience for their students and “packaging” content for new target groups, especially institutions leveraging their strong international brand reputation have a huge advantage here.

When it comes to the recognition of micro-credentials by employers, the awareness about the value of this new kind of credential is also rather low, depending also on the individual HR person often. Here, employees using micro-credentials to re- and up-skill themselves can play a major role in raising awareness and educating their employers and HR departments about what this new kind of qualification is and how it can help to improve the performance and productivity. One expert gave the example of MBAs, which turned out to have value and get recognized because of this performance improvement. Still, experts state there is also a clear trend that companies provide their employees full access to the course/credential catalogue of the MOOC platforms for company training purposes and as an additional benefit (employees looking for further education possibilities).

### Finding 4: Common characteristics

Regardless of the different perceptions of the definition, experts were asked about the common characteristics that all types of micro-credentials share. The following features have been named most often:

- **Modularity:** consisting of several learning blocs or “building stones” (lessons, units, courses)
- **Stackability:** individual learnings blocs are stackable to a larger micro-credential, which can then can also stack up to a full degree
- **Length:** larger than a single course but less than a full degree

- **Market-driven or society-driven:** focus is on the delivery of specific knowledge, skills and competences that are needed or demanded by the labour market or the citizens/society

### **Finding 5: Role of micro-credential seen in both standalone and part of degree**

Experts consider the role and use of micro-credentials both as a standalone format and as a part of a larger degree, which could be achieved by learners if they are willing to go for it. Ideally, both directions should be enabled by the micro-credential creator or issuing institution, giving learners the flexibility to choose according to their preferences and situation. Learners could also get motivated for a full degree later on, if they have the possibility to turn their achieved micro-credentials into something bigger. Still, experts note that the respective micro-credential should also work as a standalone format and work in its own right as an important employment-focused piece of education, showing competency and skill in a specific topic or discipline. Several experts also see the trend that platforms slowly move away from micro-credentials as standalone “products” or increasingly use them to move learners towards full degrees. Newly created micro-credentials get increasingly embedded within degree programs, serving as an entry point for a full degree without the commitment upfront. MOOC platforms are constantly innovating and experimenting as they are looking for a sustainable business model and responding to trends and learner feedback.

### **Finding 6: Different approaches and didactics, high potential of blending**

Experts state that micro-credentials are not limited to online courses only. However, they note that the vast majority of the available offer today is based on MOOCs, especially since the MOOC platforms have been pushing micro-credentials as part of their evolving business models and product portfolio over the last few years. Still, micro-credentials can also consist of offline courses as well. Especially a blended approach – a mix of online and face to face/offline - is considered by several experts to have a high potential, by combining the respective advantages and provide additional value for learners. For example, MOOCs can be used to provide a basic understanding of a topic to prepare for a face to face group work activity and application of the prior learning. Conversely, the kick-off could be held face to face, providing the basic understanding and getting to know each other and building trust at an early stage. Afterwards, the group work activities and collaboration could be done online. Still, several experts note that specific topics or tasks, especially those requiring physical space and activities, can be delivered better offline (such as design thinking or prototyping).

### **Finding 7: Different markets and target groups for micro-credentials**

Experts see both traditional learners (students) of higher education institutions and the so-called “professional lifelong-learners” as the targeted audiences of micro-credentials. In general, the micro-credentials provided by the MOOC platforms today could be divided into graduate diplomas (e.g. edX MicroMaster, Coursera MasterTrack), which are formalized or built on the credit system and professional



or workplace certifications (e.g. Udacity Nanodegree). One expert from the university perspective stated that they provide two types of micro-credentials at their institution – knowledge-based and function-based ones. The knowledge based micro-credentials aim at graduates at or after the master level and are built on MOOCs only. The function-based micro-credentials use a face to face or blended approach, where enrolled undergraduate students work on real problems (from industry or society) and get a certification for this. One expert from a MOOC platform divided the market of micro-credential into 3 areas:

- market 1: quick, on-demand, just-in-time knowledge to use and apply
- market 2: more in-depth, short courses (2-4 weeks, no credits)
- market 3: deeper learning, new qualification, meeting needs of people in work (more flexible, less intensive than degree etc.)

### 4.3 BARRIERS & CHALLENGES

#### **Finding 8: Chaotic terminologies, low standardization, high variability = low recognition**

As mentioned in finding 3, the low level of understanding and awareness about what micro-credentials are and what they (could) deliver is one of the key barriers. In addition, the level of standardization is very low, resulting in a high variability of length, difficulty and work effort not only between the micro-credentials offered by the different MOOC platforms but also within the various (branded and partially copyrighted) types or names of micro-credentials on the respective platforms. Missing or insufficient descriptions (such as learning outcomes, European Qualification Framework level) also add to this. As a result, it is difficult to assess the value from an outside perspective, both for learners and employers, also when it comes to compare the various offerings. Experts state that the creation of common standardization frameworks, providing a base for newly created micro-credentials, would be required in order to solve these issues. Ideally not only regional frameworks, such as the Common Microcredential Framework by the European MOOC Consortium, but also on a global level between the different frameworks and approaches already existing. As one expert said: “Micro-credentials need to take a shape”, instead of firing the “wild west of credentials” and using the term for everything. Otherwise, they will become meaningless to employers (and learners) and hurt the reputation of the whole online education sector.

#### **Finding 9: Question of quality assurance**

The role of quality assurance is of high importance when it comes to the establishment and recognition of new education formats, especially in the context of online education. Experts state that together with an increasing standardization, awareness and familiarity, this will help the market (learners, employers, HR departments) to establish trust and recognize the value of micro-credentials for demonstrating competences of new entrants and improving the performance of the existing workforce. In this context, the role of the brand reputation by the institution that offers the micro-credential is important. Universities

and companies usually have their own quality assurance procedures and guidelines that they use for creating new content and credentials. In the area of higher education, the quality is additionally secured by legal accreditation bodies. Here, universities are able to split parts of accredited study programs and offer them as shorter micro-credentials as they like.

Learners taking courses by Microsoft or Stanford University also trust in the brand name when it comes to quality assurance, same as recruiters looking at the qualifications of applicants. The use of final assessments can also help to improve recognition and value, while making sure that the level and difficulty are kept. Offering an option to recognize for credits or directly provide them with the micro-credential can also signal a level of rigor and quality and increase the credibility in the market. As expert noted, university degrees are only valuable because people see them as a “proxy” for maturity and intellectual capability or as a threshold for certain expectations of (foundational) skills of graduates. Building trust in the value of micro-credentials is crucial here, also by involving companies and co-creating the content with them.

#### **Finding 10: Stackability and transferability (higher education area)**

Experts stated that the possibilities of stackability and transferability are still limited. Not all micro-credentials provide the ability to combine and stack them up to a full degree and if so, learners have to be enrolled at the same university offering the micro-credential most of the time. Taking one finished micro-credential and getting it recognized by another university is also largely impossible. Here, a consistent delivery with university credits (as noted before) and stronger connection to the formalized higher education system (and full/traditional degrees) would be helpful according to the interviewed experts. Also supporting the stackability across platforms – to enable a mix and match of micro-credentials from different universities or institutions up to a full degree. Especially for “people on the move”, the mobility of learning and education becomes increasingly important. Experts also noted that there is the idea of using “continuous education points” instead of or in addition to the higher education credit points (such as ECTS in the EU).

#### **Finding 11: Mistrust in online education and new assessment tech**

Experts mentioned that there still exists a general level of mistrust in online education. Learner verification or authentication and the prevention of cheating is still widely perceived to be more efficient offline, even though recent technological developments like online proctoring are becoming increasingly popular and recognized for online assessments under controlled conditions (and eventually are already more efficient and secure than on-campus). One expert mentioned that while in countries like China, where online proctoring and assessments are commonplace, in Germany it is still a new topic and at an early stage. By raising awareness of the opportunities that these new technologies provide (not only for online education but also on-campus), the trust in online education can also be improved. This will also

involve stakeholders like the accreditation bodies and national governments to support and recognize this new kind of technologies and being open for change. The use of blockchain technology in the area of certification is another example for new technology in this context, helping to raise trust and validity of certifications - increasingly used by several MOOC platforms.

### **Finding 12: Soft skills online, learner decisions**

Another challenge in this context is the question of how to teach, implement and measure or assess soft skills online (such as empathy, emotional intelligence), especially as they become increasingly important due to digitization and automation. Also, one expert mentioned that there is the question whether learners are aware or competent enough to make own tracks and decisions when combining different learning elements or micro-credentials.

### **Finding 13: Limited time, internet access, payment options, growing payroll**

General challenges of online education hold also true for micro-credentials – limited access to the internet, especially in developing/rural areas, or payment options only allowing credit cards. Experts stated that there is also a trend that more content gets placed behind the paywall, since the MOOC platforms are still looking for a sustainable business model and experimenting with different approaches. They also mentioned that self-motivation and self-organization is required to finish a micro-credential, especially since not every employer supports or allows to learn during work time. Or there is simply no time besides the daily work, so people are “forced” to learn during their free time. Also, for specific target groups that are used to analogue learning (“silver surfers”), it might be difficult to switch to online learning settings.

### **Finding 14: Universities too slow, insufficient resources**

Some experts doubt that in general, universities are quick enough for creating fast-paced learning topics, especially in the area of new technology. When it comes to lifelong learning offerings and programs by universities, there are additional challenges like raising or receiving budget, no immediate return on investment, uncertainties and missing competences.

Looking at Udacity, which provides nanodegrees in collaboration with global players like Google, IBM or Amazon and focusing on IT credentials (such as cloud computing, data science, web development), experts noted that universities are basically already left out when it comes to education of new, innovative technologies and topics. This kind of close collaboration and co-creation enabled Udacity to build trust and recognition by leveraging the strong brand of well-known companies, while not having to worry about quality assurance (not creating their own control loops but relying on the existing quality assurance procedures and standards of the involved companies). New micro-credentials can also be

validated at an early stage by both experts on the field and the labour market, ensuring validity, conformity and increasing recognition from the very start.

## 4.4 POTENTIALS & OPPORTUNITIES

### Finding 15: Potentials for learners

Experts mentioned several potentials and benefits of micro-credentials for learners:

- **Re- and up-skilling:** especially new (workplace-relevant) competences and skills that are needed now and in the near future and keeping up with new/cutting-edge developments in industry but also to improve career perspectives or when changing career and moving into a new field
- **Enriching learning experience:** providing new ways and possibilities of learning, also by making use of new digital technology for teaching and learning (such as gamification elements)
- **Shorter chunks:** allowing to dive deeper into a topic of interest, small steps towards a bigger goal increasing or keeping motivation to learn (online) over a long time
- **New lifelong learning possibilities:** continuous education for people not wanting/able to go for a full degree, new offers for self-driven learners independent of employer
- **Flexibility:** choosing when, where and what specific content to learn, advance at own rhythm, also when it comes to a better work-life-balance, without having to leave the job (for full time employed learners, family commitments or other)
- **Personalization, customization, modularization:** put together or combine different micro-credentials according to personal interest and needs, different learning paths, creating dynamic and diverse profiles, “unbundling and rebundling” of education programs
- **Stackability:** having the possibility to achieve something larger (full degree) without commitment upfront
- **Less expensive/affordable:** especially in countries where education is not free and people are not able to study at a university because of lacking financial resources (e.g. USA)
- **Multi-disciplinary, interactive:** strong community building, ability to exchange and interact with learners from all around the world (different backgrounds, industries, demographics, experiences etc.)
- **Differentiation value:** by additional “trendy” certifications on the CV by well-known companies or universities, especially for young people starting the career and looking for a job, shows motivation to learn new things (which becomes increasingly important)
- **Access to global content:** from top universities and global companies that would otherwise often be impossible to study at, topics not or insufficiently covered in traditional university offers

### Finding 16: Potentials for companies

Also within the company area, experts see various benefits and potentials that micro-credentials can provide:

- **Training tool:** for re- and up-skilling of workforce and developing highly needed skills and competences, respond to need of having learning and growth opportunities especially by younger generations (“war for talents”)
- **No need to build own company trainings:** but use top programs already existing, giving access to offers from different platforms and providers and support (voluntary) continuous learning
- **Improve collaboration:** with universities, through co-creation of content, skills and competences and credentials while building on didactical strength of universities, ensuring and increasing work-relevance of education (and fill skills gap)
- **Recruiting tool:** of potential talents that were successful at a micro-credential, also in areas where an academic degree is not always necessary and the market pressure or demand is high (such as coding)
- **Employer branding:** use as a marketing tool to raise visibility and improve the image and reputation by creating credentials and providing them to the open public
- **Interactive and diverse:** workforce learning together with externals, exchanging and receiving fresh ideas from an outside perspective
- **Cost savings:** cheaper than sending employees to expensive courses and trainings for several days or paying for an MBA or master

### Finding 17: Potentials for universities

Finally, within the area of higher education institutions, experts state several benefits and potentials arising from micro-credentials:

- **New education formats (and business models)** by offering education possibilities for life-long learning and continuous professional development, after or in addition to the traditional degrees (bachelor, master, postgraduate master), developing institutional wide strategies and new business models, new revenue streams (corporate learning, recruiting etc.)
- **Scalability** of (existing) content and programs to a wider audience and new target groups through online delivery, also to people that are not able or willing to study for 2-3 years on-campus (due to work, family commitments etc.)
- **Marketing tool** to raise visibility and reputation on a global level and attract international students, as part of the internationalization strategy
- **Experimentation** possibilities of new content or different didactical approaches/methods

- **Increase quality** of teaching, by receiving feedback from large number of learners and through collection and analysis of learner data (including in-depth research possibilities)
- **Improve collaboration** with companies, through co-creation of content and close exchange when it comes to the required competences and skills (match academic & practical perspectives and strengths), ensuring relevance of education to companies and eventually resulting in further projects, but also to improve collaboration between different universities
- **Create flexible, open, multi-disciplinary curricula** addressing the needs of students, allowing to create dynamic individual student profiles, improving the learning experience
- **Address demands** of new, specific topics that the public or labour market is requiring now, extracting key points of curricula
- **Possible use case of micro-credentials** for bridging between (not fitting) bachelor and master or school leavers wanting to study, where competences and skills in specific areas are missing or insufficient

### **Finding 18: Will higher education institutions get disrupted by companies?**

Asking whether there is a risk or possibility that higher education institutions get replaced by companies in terms of providing education, experts have different perceptions. Some clearly stated the risk is low or not existing, as

- Higher education is a still very traditional business
- Fundamental/basic research and foundational (“360-degree”) education at initial stages are well established at universities
- “Student life”, closer interaction and the on-campus infrastructure play an important role in decision making
- Trust building happens mostly offline
- MOOCs have shown that the real target group are not enrolled students but rather professional lifelong learners (e.g. Udacity define themselves rather as a workforce training provider)
- Question of data protection if companies have learner data for analytics

In contrast, several experts see a clear case that universities lose ground to companies in terms of (higher) education, as

- Skills gap is still a big challenge in several industries, universities are largely not able to provide graduates with competences and skills that the market requires
- Google, Facebook, Amazon have core capabilities and skills in technological fields (e.g. SEO, social media marketing, big data) and benefit from powerful brand (and trust) and ability to provide work-relevant content

- Large corporations increasingly have their own in-house research, developing cutting-edge tech and products (e.g. pharma industry)

Some experts generally state they would rather not speak of a risk but rather an opportunity to complement and improve the existing (higher) education offers. Closer collaboration and use of the respective strength (universities for didactical/pedagogical expertise and “generic” skills especially in non-tech areas, companies for practical, hands-on perspective) while matching the different languages that each side speaks can benefit both sides.

Nevertheless, experts note that universities need to evolve to be part of the changes and trends that currently affect the education sector and rethink their long-term role. Responding to market/society changes and technological developments, while providing new or complementing offers and ways of delivery will be necessary.

Also, there is the question of who will be the main provider of opportunities and offers in the context of lifelong learning and re- and up-skilling – higher education institutions or companies? The applicability and value of full degrees in this context is questioned by several experts, especially since the lifetime of knowledge is continuously decreasing. However, one expert also noted that universities are not vocational schools and highlighted the importance of on-the-job training for practical skills and competences.

### **Finding 19: Future role of micro-credentials**

Finally, asking the experts about the role that micro-credentials will play in the future education and training system, they agree that it will be a crucial one. Helping to make education and training more work-aligned, personalized and tailored to individual needs and interests while making use of new technology and the advantages of online/open learning, micro-credentials can help to provide a new, valuable format especially in the context of lifelong learning. Working on the key challenges of awareness, understanding, standardization and enabling stackability (people amassing credentials through life and stacking them up to meaningful degrees) will be required to further improve the recognition and relevance by learners, companies and universities. Experts see that micro-credentials will evolve faster with the transformation currently going on, serving as bridge between the (further) education sector today and the one in 5 to 10 years.

## 5. SUMMARY AND RECOMMENDATIONS

Micro-credentials are seen as a promising format in the context of lifelong learning by the experts and can help to make education and training more aligned to the (fast-changing) labour market requirements, personalized and tailored to the individual needs and interests. The research questions can be answered as following, according to the expert interviews:

*RQ 1: How do experts perceive emerging trends and changing framework conditions within the education and training ecosystem?*

Experts state that learner increasingly demanding lifelong learning possibilities, in order to continuously re-skill and up-skill themselves, especially regarding the fast-changing job requirements and roles. More flexible, personalized and on-demand learning formats become increasingly important in this context, while enabling modularity, stackability and transferability of education and qualifications. War for talents, skills gap, decreasing lifetime of knowledge and an increasing value of alternative (digital) credentials were stated by the experts as some major developments in the education and training sector.

*RQ 2: How is the current offer of existing micro-credentials perceived by experts?*

The status quo is perceived as widely chaotic – different definitions, terminologies, synonyms and the low standardization among the micro-credential result in a low level of awareness, understanding and recognition, especially by employers. Experts perceive different approaches, markets and target groups for micro-credentials and see their role in both standalone format and part of a larger degree, offering high potential of blending. Still, they agree that micro-credentials share several common characteristics – they aim at providing modularity and stackability, are larger than a single course but shorter than a full degree and they are market/society-driven, focusing on specific knowledge, skills and competences.

*RQ 3: What kind of potentials do experts see in the format of micro-credentials?*

Experts mentioned numerous benefits and potentials for the three target groups of micro-credentials:



### Learners

- new possibilities for re- and upskilling
- enriching learning experiences
- higher flexibility, personalization and customization
- access to global content
- lower costs than traditional degrees (e.g. USA)
- differentiation value in CV



### Companies

- new training tool for continuous education of workforce
- improve collaboration with universities
- possible recruiting tool for talents
- marketing tool (employer branding)
- cost savings
- interactive and diverse learning (externals)



### Universities

- new LLL format and business models
- scalability of content to wider audience, new target groups
- marketing tool
- experimentation possibilities
- increase quality (learner analytics)
- create flexible, open, multi-disciplinary curricula
- improve collaboration with companies



*RQ 4: What kind of barriers are micro-credentials currently facing according to experts?*

The major challenges currently existing are the chaotic terminologies and low level of standardization, resulting in a low awareness, understanding and recognition of micro-credentials. Stackability and transferability is also largely limited, while there still exists a general mistrust in online education and new assessment technology (depending on country and industry). There is also the question of how soft skills should be implemented in online learning and whether learners are capable and aware enough to make their own tracks and decisions. Limited time, internet access, payment options and a growing paywall are additional barriers not only affecting micro-credentials, but online learning in general. Some experts are not sure whether universities are quick enough for creating fast-paced learning topics, especially in the area of new technology. When it comes to lifelong learning offerings and programs by universities, there are additional challenges like raising or receiving budget, no immediate return on investment, high uncertainties and missing competences.

Despite the numerous benefits of micro-credentials, the value of a fundamental, “360-degree” higher education provided by universities is emphasized heavily by the interviewed experts, teaching important versatile skills like problem solving or critical thinking. This solid formal education also enables graduates to adapt more easily to changing job requirements and new technology, which is evolving faster than ever before. The role of universities is not seen in the education of highly specialized workforce and serving as a training provider for the industry, especially since on-the-job training can only happen at the workplace. Therefore, micro-credentials are widely seen as a potential complementation of the existing higher education system and as a “follow-up tool” after the early academic stages (bachelor or master), rather than replacing them.

The planned CORSHIP MOOC, micro-credential and toolbox will be focusing on the topic of corporate entrepreneurship and how to improve the collaboration between startups and corporates (& academia). As the empirical findings of this report have confirmed, micro-credentials have a big potential in this context, especially when developed through a co-creation approach between companies and universities and offered in a blended format. The analysis of the micro-credential status-quo has also shown that even though there are several entrepreneurship micro-credentials existing, none of them is focusing on corporate entrepreneurship, not to mention startup-corporate collaboration. Also, no single MOOC was found during the desk research in this context. Despite the huge potential and needs for education and training programs in this increasingly important field, there is no open online offer existing to-date. This gap will be addressed and filled during the CORSHIP project and the outcomes that will be openly available.

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## APPENDIX

### Appendix 1: Interview list

Expert	Role	Field	Interview date
1	Manager Open Science and Open Access	Association of universities	19.03.2019
2	Researcher, author	MOOC aggregator	19.03.2019
3	Product manager	Certification provider	11.04.2019
4	Researcher	University	12.04.2019
5	Researcher	University	12.04.2019
6	Founder	MOOC Platform	03.05.2019
7	Program manager	Training provider	13.05.2019
8	Researcher	University	28.05.2019
9	Head of education partnerships	MOOC platform	13.06.2019
10	Head of product innovation	Smart Learning Solutions	13.06.2019
11	QA manager	MOOC platform	14.06.2019