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Bridging the Gap: Micro-credentials for Development

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Rory McGreal, Wayne Mackintosh, Glenda Cox et Don Olcott, Jr.

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Résumé de l'article

This paper describes current trends and issues in implementing micro-credentials. The Covid19 epidemic, combined with the increasing cost of higher education; employer concerns about graduate skills and competencies; increasing inequities in access; and student frustrations about lack of job opportunities have all been a catalyst for universities, colleges, independent credentialing agencies, and leaders of national qualification frameworks to rethink the broader credentials continuum in terms of open education and micro-credentials. Students desire more options at lower costs to combine their education and training for jobs. Employers want entry-level employees with better skills and capacity to learn. As a result, major colleges and universities are now actively engaged in granting and/or recognising micro-credentials. Standardising qualifications based on time competencies is an essential requirement for credit transfer among institutions. Micro-credentials are important in ensuring the acceptance and stackability of credentials from different institutions, while providing employers with a secure and unalterable permanent digital record of applicants' abilities to perform skills of high value in the workplace. The OERu (Open Educational Resources universitas) provides an example of how one international consortium is supporting SDG4: Education for All by implementing micro-credentials allowing for maximum transferability among institutions in different countries. The lesson for strategic leaders is simplicity. Micro-credentials should be well Integrated into current institutional programs, rendered easy-to-use with clear validation metrics, providing a value-added benefit for all stakeholders. A list of recommendations to institutions, governments, UNESCO and Non-Governmental Organizations (NGOs) is provided.

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Rory McGreal[1], Wayne Mackintosh[2], Glenda Cox[3], and Don Olcott, Jr.[4]
[1]UNESCO Chair in OER, Athabasca University; [2]UNESCO Chair in OER, Otago Polytechnic & OER Foundation; [3]UNESCO Chair in OER for Social Justice, University of Cape Town; [4]FRSA, University of South Africa

Abstract

This paper describes current trends and issues in implementing micro-credentials. The Covid19 epidemic, combined with the increasing cost of higher education; employer concerns about graduate skills and competencies; increasing inequities in access; and student frustrations about lack of job opportunities have all been a catalyst for universities, colleges, independent credentialing agencies, and leaders of national qualification frameworks to rethink the broader credentials continuum in terms of open education and micro-credentials. Students desire more options at lower costs to combine their education and training for jobs. Employers want entry-level employees with better skills and capacity to learn. As a result, major colleges and universities are now actively engaged in granting and/or recognising micro-credentials. Standardising qualifications based on time competencies is an essential requirement for credit transfer among institutions. Micro-credentials are important in ensuring the acceptance and stackability of credentials from different institutions, while providing employers with a secure and unalterable permanent digital record of applicants' abilities to perform skills of high value in the workplace. The OERu (Open Educational Resources universitas) provides an example of how one international consortium is supporting SDG4: Education for All by implementing micro-credentials allowing for maximum transferability among institutions in different countries. The lesson for strategic leaders is simplicity. Micro-credentials should be well Integrated into current institutional programs, rendered easy-to-use with clear validation metrics, providing a value-added benefit for all stakeholders. A list of recommendations to institutions, governments, UNESCO and Non-Governmental Organizations (NGOs) is provided.

Keywords: OER, Open Educational Resources, policy, micro-credentials

Introduction

In recent years, there is growing interest from governments, higher education institutions (HEIs), international governmental agencies and the corporate sector in the affordances of micro-credentials. In response to the COVID-19 pandemic, these organisations in both the public and private sector are having to confront new economic and workforce imperatives for the future (Carnevale, Fasules, & Campbell, 2020). Moreover, the high cost of higher education, employer concerns about graduate skills and competencies, and student frustrations about lack of job opportunities have all been a catalyst for universities, colleges, independent credentialing agencies, and leaders of national qualification frameworks to rethink the broader credentials continuum in terms of micro-credentials (Bates, 2020; International Council for Open and Distance Education (ICDE), (2019; Matkin, et al., 2020; Oliver, 2019; Selvaratnam & Sankey, 2020). The years of the pandemic have increased already existing inequity in higher education. Micro-credentials are a possible solution to ameliorate these inequities but should not rely on becoming an "outgrowth of the neoliberal learning economy", where education is viewed as a profitable commodity (Ralston, 2020, p. 2).

A recent report from the World Economic Forum (2021) has highlighted the need for an international scalable credit recognition system based on "nano-credentials". These trends have increased the interest of institutions in micro-credentials, which are becoming popular as one means of expanding the ability of learners, especially those in disadvantaged populations, to have their earned skills and competencies formally recognised.

A major function of any HEI is to assess and credentialise learning by conferring qualifications and degrees. As organizations, HEIs are well equipped and experienced to assess the quality of learning for formal academic credit. Digital media are transforming the ways people create, share and learn from educational content available on the world wide web. A significant problem, especially for disadvantaged learners, is that those who access digital learning content on the Web and acquire knowledge and skills either formally or informally cannot readily receive appropriate formal recognition for their efforts.

Approaches and models for institutional or national assessment and accreditation vary considerably around the world (Commonwealth of Learning (COL), 2019). In addition, the unique requirements of student assessment in digital learning contexts must be considered. The rapidly growing availability of online learning content could provide many opportunities for access to Open Educational Resources (OER) and/or informal learning (Committee on Culture and Education, 2014; Palvia, Aeron et al., 2018).

Massive Open Online Courses (MOOCs), which use the open web and social media to offer courses to large student cohorts comprise both for-credit and non-credit learners in the same course, and frequently register hundreds and even thousands of participants. Presently, more than four billion people have reasonable access to the Internet. More than 50%, or two billion people, do so only using mobile devices (Clement, 2020; International Telecommunications Union (ITC), 2021). Many are using their devices for learning (Mbabazi, Ali, Geoffrey & Lawrence, 2018)

Despite the rhetoric about MOOCs serving the developing world, these 'alternative' digital courses are hardly impacting socio-economically disadvantaged communities, and there are increasing disparities amongst those traditionally excluded from higher education (Manda & Dhaou, 2019;

Tchamyou, 2020). Digital tools and ICTs may be expanding the traditional inequities amongst underserved disadvantaged populations in the developing world (Hülsmann, 2016; Ichou, 2018; Lambert, 2020). This is, in fact, a social justice issue that micro-credentials could address by supporting the wider acceptance of non-formal credentials granted for completing online courses. Social justice calls for the equal participation of all in society (Fraser 2005). Micro-credentials have the potential to redress economic maldistribution through cost savings; cultural misrecognition through recognising various forms of knowledge valued in a variety of cultures; and political misrepresentation by allowing students more power in deciding how and when they want to learn.

However, while the provision of MOOCs and other forms of open digital learning on the Internet is expanding, there is a lag in corresponding systems for assessment and credentialisation of this growing international type of non-formal networked learning. Consequently, the alignment of accreditation practice with technology-precipitated changes in higher education course delivery needs to be addressed (Mardis, Ma, Jones et al., 2018).

Even before the COVID-19 emergency, employers were increasing their demands for more highly skilled and qualified workers; and students were demanding more job opportunities, advancements, and mobility in their career paths (ICDE, 2019; Matkin et. al., 2020). For example, in Europe over 40% of all employers have reported they have been unable to hire the skilled workers they need (European MOOC Consortium, 2020; Fong, Janzow & Peck, 2016; O'Grady, 2019). Traditional credentialing institutions are not addressing the needs of these employers or their job applicants. The demand for relevant skills and competencies validation is driving the demand for different forms of accreditation.

As previously mentioned, **micro-credentials** otherwise known as Alternative Digital Credentials (ADCs) have emerged as providing different ways of addressing this demand. Micro-credentials are ADCs that are based on shorter, learning interventions that focus on assessing and validating specific competency-based skills (ICDE, 2019; Selvaratnam & Sankey, 2020; Zanville & Ton-Quinlivan, 2020). At the most basic level, micro-credentials are attestations that verify, validate, and confirmj that specific skills and/or competencies have been achieved. They may or may not be digital. They differ from traditional degrees and certificates in that they are generally offered for accomplishments achieved in shorter or more flexible timespans. Several authors and institutions have developed more concise definitions of micro-credentials (Commonwealth of Learning, 2019; DeakinCo. 2017; Fong, Janzow & Peck, 2016; SUNY Trustees, 2020.)

These different definitions of micro-credentials all note that micro-credentials are generally for shorter courses than traditional ones; these micro-courses can be taken either in a traditional class environment and/or online; and may or may not be certified by an authorized agency, association or HEI. A key requirement for broader adoption of micro-credentials is that learning outcomes should be assessed against transparent standards (European Commission, Directorate-General for Education et al., 2020). Micro-credentials may be stacked towards larger units of competence and are frequently targeted at just-in-time skills and focused competency-areas. They are verified by a trusted authority and are issued more commonly as a digital badge rather than a formal transcript (Commonwealth of Learning, 2019). Micro-credentials come in a variety of forms including, but not limited to digital badges, certificates, micro-masters, and nanodegrees (ICDE, 2019, Kurzweil, 2020).

The concept of micro-credentials is not new. Universities, community colleges, corporations, government agencies and independent providers have been offering variations of micro-credentials for many years, generally for non-credit certificate programs. The differentiator today is that more and more employers are placing a premium on skills and competencies and have a growing interest in the assessment and validation of competency-based skills rather than just attestations of knowledge. There is a new emphasis, not just on what you know, but also on what you can demonstrate you can do with that knowledge at specific levels of competency and skill grades.

Students desire more options at lower costs to combine their education and training for jobs. Employers want entry-level employees with better skills and capacity to learn, which in turn gives a company a competitive advantage in the marketplace. Education and training providers want to expand recruitment avenues to contribute to the modern workforce and remain competitive. In the past, qualifications for employment were generally defined by a combination of education, experience and competencies. However, until recently the weighting of these tended to be disproportionately focused on formal education and experience (Carnevale et al., 2020). Special or unique competencies have been relevant but less important. Today, conversely, the world of work and specialisations has ushered in new and changing demands, where both job applicants and those working must continually learn and master new skills and competencies.

Indeed, this realignment in the world of work results in the increased importance of post degree-certified skills and competencies. This does not necessarily portend the obsolescence or demise of traditional credentials. However, it does mean that employee qualifications will become more relevant and diverse, where this composite mix could become a competitive differentiator for candidates seeking expanded employment mobility and advancement.

The shift to a service-knowledge economy has been a catalyst for employers and other stakeholders to reframe their preferred qualifications mix. In sum, potential employees need up-to-date skills, and the existing employees need continual on-the-job training. Both must show demonstrated competencies and skills that have been vetted, assessed and validated. Similarly, student graduates and candidates need to skill-up to give them optimum competitive advantage in seeking career employment opportunities, mobility and advancement.

Institutional Response

Reputable HEIs are now actively engaged in granting and/or recognising micro-credentials. The adoption of micro-credentials is emergent, with only one in five institutions reporting that micro-credentials are non-existent at their institutions and roughly half of institutions have a micro-credential policy in place. In addition, according to a Holon IQ (2021) survey of 320, higher education leaders, micro-credentials were seen as being integrated within degree programs. Public-private partnerships such as *Coursera, Futurelearn*, *Udacity*, and *edX* are HEI consortia that now grant micro-credentials to learners who successfully complete their courses and/or programmes. In addition, many independent training organisations and certifying agencies have redirected their operations, using micro-credentials to address this rapidly growing market (Australian Government, 2019, 2020; COL, 2019; FutureLearn, 2020; ICDE 2019; Matkin et al., 2020).

Many HEIs work within their government's national qualifications frameworks or try to conform to industry-wide competency-based standards. Australia, New Zealand and Europe are notable examples of having robust qualification frameworks that can, and are being adapted for a burgeoning micro-credential marketplace (Australian Government, 2019, 2020; European Union, 2018; Kato, Galan-Muros, & Weko, 2020); New Zealand Qualifications Authority, 2019).

In the past, many HEIs have addressed informal competency training, particularly through their extension or continuing education offices. However, much of what was being offered by continuing education units were non-credit certifications of attendance or participation (e.g., like some open badges today); attendance at professional conferences or one-day seminars, etc. These learning experiences were not formally assessed, in most cases, for new knowledge learned or for competencies mastered.

Assessment and validation processes are becoming more refined and designed with greater rigour and standards. In addition, there is a trend for micro-credentials to be issued by different providers, whether they are academic institutions, professional/trade organizations or employers. These micro-credentials can be mixed and combined to become part of learners' portfolios attesting to their skills, knowledge and competencies. They may or may not be stackable towards higher qualifications and credentials or integrated into formal certificate and/or degree credit programmes (ICDE, 2019; Kato et al., 2020).

Key Characteristics of Micro-credentials for Academic Credit

Micro-credentials address time as a key factor in supporting accessible education. Time is a traditional variable nearly universally associated with the awarding of academic credit. Time in the classroom, time online, time in the field doing research. Time has traditionally been a key measure of learning effort for formal qualifications. To the benefit of learners, competency-based assessment proponents have challenged this assertion and argued that if the competencies in a targeted skill domain could be validated and assessed to a minimum performance level, then the time factor in acquiring those skills becomes less important. Indeed, whether credit or non-credit, the time factor may be discarded with micro-credentials, particularly when assessments become linked to specific competencies and ultimately to skill levels.

HEIs have historically not focused extensively on establishing polices and processes for non-credit or non-formal educational activities to be converted to academic credit. While some HEIs have robust practices for Recognition of Prior Learning, to recognise learning acquired outside of the classroom for formal credit, the labour intensive process of assessing portfolios is expensive and hard to scale (McGreal, Conrad, Murphy, Witthaus & Mackintosh, 2014). The time requirement for assessing non-formal learning is important. The duration and effort required by the learner must be in keeping with the amount of credit earned. In addition, the level and rigour of academic work (a valid quality issue) and must be commensurate with university credit requirements in order to be accepted and/or stackable (Lakin & Underwood, 2017; Teach Online, 2020).

Affordances of Micro-credentials

As a rationale for implementing and accepting micro-credentials, institutions refer to their importance as a means of upgrading their students' skills and competencies for employability. Micro-credentials should enable an HEI to remain competitive, adaptive and current in the marketplace, because they can provide employers with a secure and unalterable permanent digital record of applicants' abilities to perform skills of high value in the workplace. Students will have control of their micro-credentials and be capable of distributing them digitally, unlike with traditional transcripts that are controlled by the institution (Matkin, et al., 2020). The International Council for Open and Distance Education argues that institutions must use them to respond to technological change and the growing need for continual, rapid skills training (ICDE,2019).

The world economy is digital and online; society is digital and online; so, it is not surprising that students and employers are demanding the ability to validate and document skills and competencies digitally online. The present HEI paper-based transcript systems do not meet this need. Micro-credentials can address this need flexibly in a scalable system, by personalising credentials, providing recognition to employees, and by validating skills as they are acquired (DeakinCo, 2017). Other affordances of micro-credentials include the ability to respond quickly to training needs with faster stakeholder outcomes; lower cost in credential distribution; and the ability of learners to build skills portfolios. (Teachonline, 2020).

For the learner, the most important affordance of micro-credentials is the possibility of having their skills and competencies recognised. Other benefits, include having fast access to learning on demand at lower cost and with more choices, especially regarding skills in demand in the marketplace. For institutions, micro-credentials can be a new source of revenue from new markets, while decreasing costs. This, combined with stronger links with employers and professional bodies can lead to a better understanding of the needs of the marketplace. Employers, relying on micro-credentials can ensure that their hiring practices are more competency-based, and so enable their ability to adjust to new technologies and business processes as they become available. For governments, micro-credentials will empower citizens to quickly adjust to changes in the economy through rapid training and allow citizens to be more mobile through the acceptance of transfer credits among institutions nationally and even internationally.

Barriers to Micro-credentials

There are many potential barriers beyond the usual resistance of institutions to change. A recent international survey of university and industry leaders cite lack of agreed standards, quality assurance and trust as the greatest barriers to micro-credential adoption (Holon IQ, 2021). The lack of senior leadership, who are willing to position micro-credentials in a strategic context, is also seen to be a serious obstacle. This results in few resources (fiscal or human) being allocated. When there is no integration of micro-credentials into the institutional framework, it is seen as an add-on, and the costing is not clear. The lack of incentives for faculty and staff has also been noted (Cirlan & Loukkola, 2020; COL, 2019; ICDE, 2019; Kato et al., 2020; Matkin et al., 2020; & Pickard, 2018).

Another major barrier related to awarding academic credit concerns micro-credential validation and acceptance for transfer credits among institutions both within a country and internationally. Many HEIs even lack the authority to accept transfer credit at the institutional level, as the oversight and authority reside with each academic unit and its faculty members. Faculty can often refuse transfer credits to their programmes even from other departments within the same institution. This can be a significant impediment to micro-credential acceptance in institutions (McGreal & Olcott Jr., 2021)

Case Study: A Working Model for Transnational Micro-credentialing

This case study summarises the implementation of a transnational micro-credentialing system developed by the OER universitas (OERu). OERu is an international network of over 40 partner institutions across five continents, including 17 in developing countries, who collaborate to assemble freely accessible, high quality, accredited online courses from OER. Learners study for free and can request assessment-only services for micro-credit with pathways to formal academic credit towards university qualifications.

Drawing on five scenarios for reusing open courses, combined with alternate mechanisms for assessment, credit transfer, and credentialing (Conrad, Mackintosh, McGreal, Murphy & Witthaus, 2013), the OERu partner network opted to develop an international system for course credit articulation based on the Transnational Qualifications Framework for the Virtual University for Small States of the Commonwealth (Commonwealth of Learning, 2015). The framework defines standard levels of learning and corresponding learning effort for post-secondary qualifications to facilitate articulation within provincial and national accreditation and qualification systems.

The OERu partners first proposed developing micro-courses at their 2013 International Meeting (OER Foundation, 2013). Their aim was to develop an international system for credit transfer, accommodating small course components to facilitate network reuse of micro-courses, while still accommodating traditional university credit structures, with open pathways to formal qualifications.

This micro-credential system is based on the concept of notional learning hours, referring to the length of time a student would typically take to achieve a stated learning outcome. This could include contact time with an instructor, time spent studying, completing assignments or specified tasks, and time spent in assessment. Ten notional hours equal one credit.

The OERu standardised on 40 notional learning hours for each micro-course, to ensure sufficient learning for meaningful assessment, and to accommodate international differences in the size of degree courses. Consequently, three OERu micro-courses is equivalent to a standard three-credit course in North America, while four micro-courses is equivalent to a standard undergraduate course in Australia and New Zealand, and five micro-courses equates to a module of 200 notional learning hours in the United Kingdom.

This framework approach has facilitated reuse of OERu micro-courses at different institutions and enabled a system of transnational micro-credit transfer that is recognised by credentialing authorities. For example, the OERu's Learning in a Digital Age (LiDA103) series of micro-courses was recognised for assessment through Otago Polytechnic's micro-credentialing system, and the

four combined micro-courses were approved for credit transfer at first-year undergraduate level towards qualifications at OERu partner universities in New Zealand, the USA, Canada, and the United Kingdom. The four LiDA micro-courses were submitted to the New Zealand Qualifications Authority, which evaluated them and assessed them to be equivalent to 16 credits (160 notional learning hours) at Level 5 on the New Zealand Qualifications Framework.

Western Pacific University in Papua-New Guinea, an OERu partner institution, has introduced LiDA as a required foundation course for all its students. Learners gain access to the micro-courses directly from the OERu site and will be assessed by the University. In another example, North-West University in South Africa remixed sections from the OERu's Introduction to Entrepreneurship series of micro-courses to offer a customised micro-course for inclusion in their Introduction to Business Management (BMAN111) course. Students were required to work through this micro-course hosted by OERu and complete a series of quizzes which contributed towards their continuous assessment mark for the course (TELIT-SA, 2021).

As an open education initiative, the OERu does not require learners to register an account to gain access to learning materials. During 2020, 208,234 learners, primarily from developing countries engaged with OERu micro-course materials. Of these, 14,492 (7.2%) opted to register on the respective micro-course sites to receive automated course instructions via email. Completion rates are defined as registered learners who complete all the learning pathways within a micro-course and range from 10% through to over 90% in cases where course completion was a requirement for formal academic credit, as in the North-West University example cited above (OER Foundation, 2021; TELIT-SA, 2021)

The OERu administers an optional New Participant Survey (n=2,255) which provides some insight into motivations of learners who register for micro-courses. Half of the learners are female, and one-third of OERu learners are unemployed. Intended levels of participation are typically low with 12% reporting that active participation is unlikely and 32% indicating that activity will be limited to a few contributions before commencing the courses. Four out of five OERu learners are post-secondary graduates. One in five learners are taking OERu courses as a formal study requirement at their respective institutions, with 44% and 20% reporting that they are taking OERu courses for professional or personal development respectively. Of particular interest is that 39% of respondents confirm that they are taking OERu micro-courses to gain formal academic credit towards a recognised qualification. The data indicates growing interest in micro-credentials with 46% of registered learners reporting that they intend to pursue an OERu micro-credential with an additional 33% responding that they are considering a micro-credential as a possibility.

In conclusion, free micro-courses that are open and online, enable professional development and opportunities for learners to study topics of interest, while providing peer-learning support for those studying for formal credit. The micro-course format facilitates reuse in different institutional contexts. Given the growing interest of learners in gaining micro-credentials, the OERu case study demonstrates a functioning model for transnational transfer of micro-course credit towards formal qualifications.

Summary

This paper describes current trends and issues in implementing micro-credentials. The portrait is complex and encapsulates many concurrent activities that are often difficult to map and monitor. The range of work on micro-credentials across the globe is impressive, the ideals are high and the potential impacts towards workforce and economic development are exciting. Employers and students are still confused and unfamiliar with the range of options that are evolving with micro-credentials. There is today more awareness as the growing demand for shorter focused credentials leading to employment continues. This in turn can empower both employers and learners and augment their competitive capacity. There are multiple players ranging from governments, qualification agencies, and HEIs to accrediting associations, independent training providers, and global consortia grappling with policy, marketing, and planning about micro-credentials. The lesson for educational leaders is simplicity. Integrate with current institutional programs, make micro-credentials easy to use with clear validation metrics, and make online-open-micro-credentials a value-added benefit for all stakeholders.

Institutional Recommendations

Effective implementation of micro-credentials requires that institutions: build trust in the quality of the credential for learners and employers, ensure that implementation adds value to existing practice and achieves sustainable resourcing (Oliver, 2019). Institutions embarking on micro-credentials should:

1. Adopt a pilot implementation approach to evaluate, refine and scale a sustainable solution, adopting existing open online courses published as OER to lower risk, minimise cost but maximise impact.

2. Develop and maintain supportive policies clarifying standards for credit-bearing micro-credentials aligned with qualifications integrated within existing degree structures.

3. Provide opportunities for augmenting course delivery, while ensuring quality, to serve new and emerging markets to address the changing needs of learners and employers.

4. Provide adequate resourcing for sustainability through new revenue or existing resource allocation, thus mainstreaming implementation within the institution.

5. Implement and stay the course! Most change initiatives fail because the leaders and team members lack the patience to go the distance.

Recommendations for Governments

The evolving nature of work combined with the challenges for higher and vocational education in a post-COVID world requires more flexible options for certifying learning, incorporating micro-credentials. However, a systems-wide approach is needed to align and integrate credit bearing micro-credentials within national qualification systems to facilitate interoperable certification systems combined with a digital system for registering and keeping record of learning achievement for assessed learning.

1. Regional accreditation agencies and/or national qualification authorities should integrate micro-credentials within their respective certification systems incorporating

levels of learning and metrics for expressing the value of learning achievement; for example, notional learning hours, in consultation with international counterparts to promote transnational interoperability of micro-credentials within qualification frameworks. This will build trust and facilitate agreed standards and quality assurance for learners and prospective employers.

2. Review national funding models to ensure that the financing of post-secondary systems does not discriminate against micro-credentials for public funding.

3. Develop national digital systems that can be self-managed by learners to record credit earned for assessed learning inclusive of micro-credentials in support of a lifelong learning record. Technologies like the Blockchain may support such systems for reliable recording of information.

Recommendation for UNESCO and NGOs

1. Work with the micro-credential community to create policy guidelines for governments, HEIs and other stakeholders promoting learner mobility using micro-credentials.

2. Develop an international database of micro-credentials initiatives and monitor the acceptance and use of micro-credentials in different regions.

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