

Micro-Credentials in Higher Education Institutions: Challenges and Opportunities

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Abstract: The COVID-19 pandemic has changed the education sector locally and globally especially in teaching and learning delivery methods as most universities have adopted online platforms. The present situation is not only challenging but also tests the flexibility of the existing education system. With the help of technology, the existing traditional education system could be more flexible to enable more individuals from around the world to access education. The latest revolution in online education, micro-credential, is growing interest among public and private universities worldwide, including Malaysia. However, to date, little scholarly work is found related to micro-credentials in higher education. This conceptual paper presents an overview of micro-credential and the challenges and opportunities of offering micro-credential certification in the form of digital badges to the national and global market. Recommendations are made to multiple stakeholders (e.g., higher education providers, employers) to enhance the use of certifications for graduate employability. Ideas for further research are also presented.

Keywords: Digital badges, Digital credentialing, Higher-education, Micro-credential, Online certification

1. Introduction

Technology has helped the global education system to be more innovative in developing cutting-edge programmes. Many countries are doing various initiatives to promote quality education through state-of-the-art technology. The Coronavirus disease (known as COVID-19) outbreak has changed the education landscape worldwide. Since the pandemic hit the world in December 2019, many higher education institutions are moving towards the online platform as their primary mode of delivery (Chung et al., 2020; Samat et al., 2020). Online learning is no longer an option because almost all institutions utilize online platforms for teaching and learning. The pandemic has made teaching and learning using online platforms the new normal. The readiness of online learning among university students is better than before the outbreak (Chung et al., 2020). At least four factors influenced student

behavioral intention to use online learning, including performance expectancy, social influence, facilitating condition, and intrinsic value (Samat et al., 2020). The pandemic has shown the importance of technology in advancing teaching and learning.

The COVID-19 pandemic is challenging the flexibility of the existing education system. The current education system has to change by allowing people from everywhere to have access to education. Technology is transforming the way education used to be, from traditional methods of getting degrees to entirely using online platforms to earn a degree. Learners do not have to be present and complete their programmes on campus to get a degree because most processes can be done online. Since technology has been widely used in education and the pandemic has accelerated the growth of online learning, many higher education providers use technology to develop and offer academic and non-academic programmes either fully or partially online. This way, learners can potentially come from all over the world. Higher education providers are reflecting one of the sustainable development goals by the United Nations related to quality education (SDG Goal 4: Quality Education) when learners from different countries and backgrounds could have an equal opportunity to learn and participate in the programmes. Additionally, the Malaysian government is committed to transforming our higher education, as evidenced in the Malaysia Education Blueprint 2015 – 2025, and aims to raise the level of our education parallel to the international standards and prepare the Malaysians for the future. The blueprint detailed ten shifts, including producing more holistic and balanced graduates (shift 1), promoting lifelong learning (shift 3), improving online learning (shift 9), and transforming higher education delivery (shift 10) (Ministry of Education, 2015). The government plan is aligned with the current phenomena of online learning, as many higher education institutions utilized technology and innovation to offer a better and more personalized learning experience. Moreover, during the Budget 2021 announcement, the Malaysian government allocated a significant budget for upskilling and reskilling employees and funding to certify graduates with future skills (The Edge Markets, 2020). Therefore, higher education providers and employers should support the government initiatives as the country moves toward a high-income nation.

Many institutions offer online certification programs; however, a limited number of higher education providers offer mini-degrees, mini-qualifications, or known as micro-credentials (MC). Some scholars described MC as an added certification to complement a formal qualification (Selvaratnam & Sankey, 2021). The MicroHE in Europe defined MC as “a sub-unit of a credential that could accumulate into a larger credential or degree or to be part of a portfolio (e.g., digital badges, micromasters, nanodegrees)” (p.12) (MicroHE, 2019). In Malaysia, the term MC emerged in 2019. The Malaysian Qualification Agency (MQA) launched the MC guidelines for higher education institutions to refer to when developing MC to ensure that the developed programmes are well-accredited and validated. The MQA define MC as “a term that encompasses various forms of certifications, including nanodegrees, micro-masters’ credentials, certificates, badges, licenses, and endorsements...As the name implies, MC focus on a much smaller volume of learning than the conventional awards, which allow learners to complete the required study over a shorter duration. In their most developed form, MC represents more than mere recognition of a smaller volume of learning. They form part of a digital credentialing ecosystem, made possible by digital communications technologies establishing networks of interest through which people can share information about what a learner knows and can do” (MQA, 2020, p.3).

International institutions offering MC include Griffith University, Australia, and Loyola University Maryland, United States. In Malaysia, a few universities such as Universiti Sains Malaysia, University of Malaya, and Universiti Teknologi Malaysia have started offering MC in their respective institutions. Nonetheless, these institutions might have a unique approach to MC because providing a one-size-fits-all approach to MC is not recommendable (Acree, 2016). Starting the year 2020, Universiti Teknologi MARA (UiTM) included MC in their Strategic Planning UiTM2025 to offer MC modules to national and global markets. The university aims to increase the graduate employability of its students through the MC programme. The Institute of Continuing Education and Professional Studies (iCEPS) at UiTM is responsible for developing and promoting MC modules using the university platform. Considering the effect of COVID-19 on the education sector, it seems reasonable that more higher education providers will be offering online or digital certification programmes like MC.

The COVID-19 pandemic has accelerated the adoption of MC certification programmes throughout the world. For many years, MC programme has concentrated on working adults, including educators, as part of their professional development (Acree, 2016; DeMonte, 2017; Hunt et al., 2020;

Ralston, 2020). Because MC embraces flexibility in delivery and learning on demand, the programme is suitable for working adults as they do not have to attend classes on campus. MC is the way forward for employees or working adults to build in-demand professional skills and competencies while advancing their careers. Due to the current situation of the pandemic and its impact on education, MC is essential in the present and the post-pandemic. Accordingly, there are opportunities to offer MC for undergraduate and postgraduate levels too. Nevertheless, many questions exist around MC and its implementation.

While many higher education providers are starting to offer MC certification programmes, it is essential to know whether employers accept MC at national and international levels. Also, do national and international employers recognize the skills and competencies gained through MC and digital credentials? Because MC is on the rise in western countries, perhaps many employers value MC certifications when the industries are onboard with MC for continuous professional development of their employees (Ralston, 2020). On the other hand, MC is relatively new in Malaysia; hence, employers' acceptance of the MC and digital credentialing is unknown. To the authors' knowledge, degree programmes are still dominating most higher education in Malaysia.

This conceptual paper presents an overview of MC and discusses the challenges and opportunities of offering the MC certification programme to the national and global markets. This article is organized as follows; the first part of the article will provide an overview of MC certification programmes, including past studies related to MC. Next, the authors will review the MC certification programmes and digital credentialing in Malaysia. Using previous work in western countries, the authors presented the challenges and opportunities in developing and offering MC certification programmes. The authors suggested a potential MC approach for UiTM and shared a MC framework by UiTM Cawangan Pulau Pinang, Malaysia. Lastly, recommendations are made to multiple stakeholders together with the unexplored research avenues. The novelty of this paper is twofold: (a) This is the only known paper highlighting the MC experiences in Malaysia since the launch of the guidelines by the MQA and the subsequent offering of the programmes by several higher education providers and (b) This article showcase the suggested approach to MC for UiTM through a Micro-Credentials@UiTM CPP framework developed by UiTM Cawangan Pulau Pinang.

2. Overview of Micro-Credentials (MC) Certification Programme

Open Badges initially introduced the MC certification programme in 2013 to encourage lifelong learning for adults in the workforce using digital badges system (DeMonte, 2017). Since then, many parties have started developing MC modules, and using digital badges to reward those who completed their MC modules has been popular among working adults. During that time, the education sector saw an opportunity to implement similar digital badge courses for teachers' professional development. In the United States, MC programmes are gaining popularity as part of professional development programmes. Usually, the professional development courses often rely on short and standardized workshops; with MC, working adults will have opportunities to engage in self-paced learning which is connected to their daily jobs and later earn recognition in the form of digital badges for the completion of the modules (Acree, 2016). The Friday Institute for Educational Innovation collaborated with Digital Promise in developing MC programmes to encourage teachers to engage in rigorous, self-paced, and job-embedded professional learning, which is connected to skills and competencies needed by teachers in their classroom (Acree, 2016). The institute reported that experienced MC teachers wanted to earn more certificates (Acree, 2016). Moreover, most teachers wanted to enrol in self-paced professional development programmes related to things they do in their classrooms (DeMonte, 2017) and later integrated their learning into the classroom and demonstrated their competencies in many ways.

Even though MC promotes flexibility in learning, it is crucial to have a proper instructional design to ensure that learners can learn the required skills and competencies via an online platform (Acree, 2016; Rosenberger, 2019). Higher education providers normally unbundle their educational products and services based on specific skills and competencies when developing the MC modules (Ralston, 2020). Generally, a complex instructional skill will be broken down into smaller fundamental parts focusing on specific skills and competencies. In other words, a person can choose which skill or competency they plan to improve and then enroll in the respective MC. Focusing on specific skills and competencies would allow them to design MC modules with the right bite-size while meeting the

industry requirement. Furthermore, having a reliable online platform is also important because those in remote areas might have difficulties accessing the platform, thus requiring a more reliable, high-quality internet connection. DeMonte (2017) stated that some people prefer MC because of the flexible programme structure. There will be some evidence-based assessments in each module despite the flexibility, and learners will be awarded an e-certificate or digital badges once they complete the modules. Developing suitable assessment techniques is essential to avoid learners' frustration from doing many assignments to complete a module (Peacock et al., 2020). It is expected that the learners should demonstrate the skills or competencies earned through the modules when performing their job.

Rosenberger (2019) interviewed ten instructional designers who were involved in designing and implementing digital badging programmes. Some critical findings reported include no specific standard instructional design method when developing programmes; hence, they used several steps to design and implement the programme, including iterative design, pilot process, gathering feedback from participants, and improving the digital badges. Pitt et al. (2019) interviewed university administration officers and human resources personnel to examine the use of digital badges as an alternative to the common education system. They found that the respondents were confident about using digital badges as professional development programmes for science, technology, engineering, and mathematics learners despite concern about the credibility of the credentials. Ghasia et al. (2019) studied the perception, readiness, and implementation of MC programmes among educators, learners, and educational technologists and found that educators and learners were confident that MC would encourage lifelong learning and promote the university to the world. Despite that, a clear formulation of strategies and policies about the structure of the MC certification programme that a university wants to develop is needed. When designing the MC modules, it is essential to incorporate relevant skills and competencies; hence, gathering inputs from employers is crucial.

Gauthier (2020) interviewed 22 industry professionals from various sectors and found interesting feedback from the industry. Most of the participated industry professionals were not satisfied with employee skills and claimed that the seat time when doing MC modules did not equal education. Employers questioned the validity of the digital badges and suggested learners present their micro-credentials certificates along with their academic transcript to show their ability to apply knowledge and skills. More importantly, employers recommended using a system to track all MC certifications earned by individuals so that employers can easily access the digital badges when needed to verify their employee credentials. In addition to having a system to track records, Gauthier (2020) reported that higher education providers need to develop proper rules for issuing MC certificates similar to the regular academic transcripts to protect the credential's validity. Meanwhile, Hunt et al. (2020) highlighted the benefits of MC for learners, including personalized professional learning, competency-based learning, flexibility and accessibility for learners, and effective collaboration among learners in a shared platform. Next, the authors will explain more about MC and digital credentialing and how higher education providers can recognize MC.

3. Micro-Credentials Certification Programme and Digital Credentialing

MC certification programmes are different from the traditional university degree programmes. Based on the MQA (2019) definition, MC focuses on a limited series of modules and focuses on a narrow range of skills or competencies. These skill- and competency-based online certificate programmes sometimes are stacked or grouped, which allow learners to accumulate the modules or a series of modules for more recognizable credentials (Ralston, 2020). MC certification programmes are often paired with digital badges or credentials given online to award those learners who completed their modules. MC certification programme and digital credentialing is an official recognition of learning through courses of organized lessons, modules, or units that give learners knowledge, skills, values, and competencies in a specific field of study or discipline through digital badges, as a piece of evidence to the achievement of such specified units of knowledge by the learner (MQA, 2020). Digital badges indicate achievement, competency, quality, or interest, which are used to set targets, reinforce behavior, represent accomplishment, and display success in many contexts (Mozilla Foundation & Peer 2 Peer University, 2012). Within the digital badges, metadata are embedded with details on the issuing institution's name, date of issue, and criteria for earning the badge (Devedžić & Jovanović, 2015).

Furthermore, digital badges can be disseminated via social media and professional networking platforms, in addition to offering a visual record of achievement. Most digital badges can also be printed and added to a physical portfolio and a digital portfolio. The portfolio will include comprehensive details about what was accomplished to obtain a badge (Devedžić & Jovanović, 2015). Additionally, these digital badges are portable and secured to be used in other platforms and validated by the providers online. For that reason, public and private higher education providers are becoming interested in developing and offering MC. At the same time, scholars argued that MC is difficult to be accredited (Ralston, 2020). The MQA has taken proactive steps to develop guidelines and policies to validate and recognize MC certification programmes designed by higher education providers in Malaysia. Nonetheless, the MQA highlights in their guideline to good practices, MC developed by providers should be outcome-based, personalized, industry-driven, on-demand, and transparent (MQA, 2020).

Based on the earlier MQA guideline, there are two ways by which higher education providers can recognize MC: (a) credit transfer and (b) accreditation of prior experiential learning (APEL) (MQA, 2019). MC offers courses or units from an accredited programme that the learners can submit for credit transfer consideration to any higher education providers. Then, the institutions must evaluate the MC certifications and grant credits to MC holders subject to the maximum credit transfer allowed under the MQA Guidelines for Credit Transfer for MOOCs. Higher education providers offering MC modules from the accredited programme must include such deliveries within the scope of the internal and external review of the accredited programme to ensure comparability of the courses and seamless credit transfer. Besides credit transfers, the MQA has developed APEL (C) guidelines that permit non formal and informal learning to be evaluated and accorded recognition or credit. Learners can submit the learning acquired through MC certification programme other than the type described in credit transfer to recognized APEL (C) centers for evaluation. Consequently, offering MC modules usually involves integrating higher education providers and online education providers such as OpenLearning, Coursera, or Udemy. This is because the modules are generally designed and developed by higher education providers. In contrast, online education providers are mainly utilized as an online platform where the modules are being placed. In addition, MC providers are also responsible for issuing digital badges, providing technologies for the security, maintenance, management, and authentication of digital badges. In some instances, higher education providers with enough resources and facilities can offer MC independently without using online education providers' services. The authors will address the challenges and opportunities in implementing MC certification programme in the following section.

4. Challenges in Implementing Micro-Credentials Certification Programme

Based on the previous work in western countries, the authors identified several challenges in developing and offering MC to working adults and potential undergraduate and postgraduate students. The first challenge is mutual understanding across stakeholders (i.e., learners, educators, universities, MC providers, employers) (MicroHE, 2019). Learners as the end-users perceived MC as an alternative to acquiring more competencies; educators think MC is a form of formal and informal recognized credential that is very focused, specific, and can be completed within a short period, while employers perceived MC as similar to certificates of attending professional development programme for lifelong learning.

Among the challenges in MC are managing the mass number of online learners. Since MC certification programme is fully implemented online, there are possibilities for course enrolment from massive learners worldwide (Alias, 2020). Thus, it may be challenging to handle learners in large numbers in terms of monitoring and assessing the learning activities. These are some of the barriers to scaling up the programme (Acree, 2016). In addition to that, the MC providers should ensure that their MC modules are internationally recognized prior to scaling because the portability of the credentials in the form of digital badges is important (MicroHE, 2019). It is a concern that with the competition between MC certifications and the traditional degrees, the intake for traditional degrees will eventually drop when employers value MC (Kasriel, 2018).

Commitment is far and foremost the critical challenge in offering MC certification programmes. Developing MC modules demand a full commitment of the module developers. The development process is time-consuming and requires proper planning and implementation in brainstorming ideas, contents outline, learning activities, and video production. Therefore, the top-level management of

universities and MC providers should ensure financial (e.g., incentives for developers) and non-financial support (e.g., proper guidelines, recognition of credentials). Offering incentives or institutional credit to the module developers is vital to boost their motivation when designing the MC modules.

Additionally, institutional readiness to provide appropriate resources in terms of facilities and infrastructure is crucial, particularly when they want to scale up the MC certifications to a broader market (Acree, 2016; Ralston, 2020). Developing teaching materials for MC requires instructors to use interactive videos as the learning aid, thus requiring a proper studio with suitable equipment for video production. Technological tools such as video production hardware and educational software could also catalyze succeeding course development stages. Furthermore, related skills such as technological literacy among the stakeholders (i.e., educators, students) are needed for a smooth implementation of MC. The readiness will also cover the needs of a proficient technical support team to assist in the overall process, such as during the course development stages and maintenance of the online platform. Until the success of offering MC could be achieved, many expenditures must be invested. Therefore, the top-level management of universities and MC providers should allocate enough funding to support the development of MC. They need to consider the related costs of online platform development, subscription for the third-party online platform, and acquiring appropriate technological tools. Also, when dealing with learning using online platforms, internet connectivity is among the most significant challenges (Chung et al., 2020); hence a reliable internet connection is fundamental.

MC certification programmes might be well-known in western countries, but most Malaysians are not familiar with the term. Therefore, issues would include the level of awareness and acceptance of the public, learners, educators, and employers in recognizing that learning may take place beyond the traditional education system (MicroHE, 2019). Traditional degree programmes still dominate Malaysia's education landscape, and most employers are still asking for academic transcripts during the hiring process. Even if earning additional credentials is an added advantage for job applicants, some learners are concern more on the learning quality than the credentials (MicroHE, 2019). Nonetheless, since MC is gaining popularity, it is expected that many higher education providers and MC providers will offer an array of MC certification programmes soon. This occurrence will make the competition between MC providers getting tight. The following section will describe the opportunities and benefits of offering an MC certification programme.

5. Opportunities and Benefits of Offering Micro-Credentials Certification Programme

Recognizing the potential evolution of MC globally and locally, there remains opportunities for MC to expand because MC certification programmes are still underdeveloped in Malaysia. Through flexible design and delivery, people will have greater access and choice in embarking on higher education opportunities. As MC promotes self-paced learning, learners will have more control over their professional development and individualized pathways (MicroHE, 2019). Online and digital delivery will allow people near and far to access the learning materials anywhere and anytime. In contrast to traditional face-to-face learning, now learners conveniently could learn from any place all over the world (Alias, 2020). For example, the MC certifications offered in Malaysia may be taken by learners from other countries. Considering the technological advances available today and rapidly improving internet access and broadband speed, more people can enjoy better quality and industry-focused learning to enhance their careers. MC offers a convenient learning process, and learners are being awarded with digital badges after each module completion. Using digital credentialing as a form of recognition could motivate and engage the learners.

Some sectors have predicted that traditional university degrees will fall because they are too costly and take years to complete (MQA, 2019). Such a situation allows higher education providers to tap into a different market of students and workers who are less motivated to enter a time-consuming university degree. MC certification programmes provide a more dynamic, competitive, demand-driven, shorter, and cheaper alternative to traditional degrees and cover virtually any learning area ranging from niche technical skills to broad non-technical skills. Such credentials will accelerate learners to penetrate the labor market sooner, along with the options to undertake additional credentials if deemed necessary in their future career plans. Learners with part-time or full-time jobs can see MC as more accessible than a general degree. Also, experienced workers can use MC to upskill in a specific area. It may also be appealing to undertake a series of stackable MC that can be completed over time to gradually

aggregate learning, equivalent to a formal qualification. In line with the opportunities mentioned above, MC providers could generate income from the enrolment of learners by charging tuition fees.

Alternatively, once a learner completed their MC module, they can get the certification or digital badge for a fee. Theoretically, the modules offered by MC apply quite a similar approach to the existing conventional programmes where students will be charged tuition fees for their enrolment. MC is a lower-cost alternative for learners to obtain knowledge, skills, and competencies; hence, the tuition fees for MC should be cheaper due to the bite-size modules. Collaborating with prominent industries and professional organizations to offer appealing, professional certificates in addition to well-accredited credentials could be one of the strategies to market the MC.

6. Micro-Credentials@UiTM CPP: The Framework and The Action Plans

Higher education providers offering MC modules must have a unique approach to MC. As the largest public university in Malaysia, UiTM has many potentials to excel in MC. Despite the high motivation to offer MC while supporting the government agenda in the Malaysia Education Blueprint 2015 – 2025 (Ministry of Education, 2015), awareness among educators and learners on MC is crucial because that will determine the success of MC initiative. For that reason, UiTM Cawangan Pulau Pinang, one of the UiTM branch campuses, organized a seminar on 19th October 2019 to create awareness among educators and learners and spark interest among module developers. Educators who have been actively involved in developing online courses were selected as module developers and were trained to develop MC modules and learning materials.

After the seminar, a series of workshops were conducted to train the module developers to unbundle the courses, design the modules, record and edit videos, and incorporate suitable assessments for each module. The Micro-Credentials@UiTM CPP project aimed to offer MC for professional and personal development of the current and potential students and working adults. Figure 1 that follows shows the process of MC module development and implementation phases. The validity and reliability of MC developed were evaluated by iCEPS, UiTM.

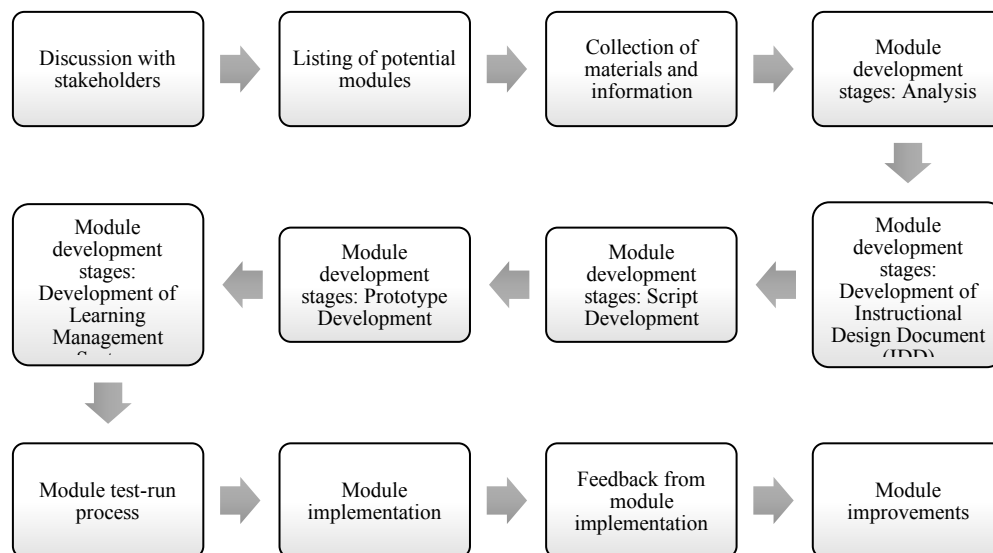


Fig. 1 Micro-credentials@UiTM CPP Framework

The MC modules designed by UiTM Cawangan Pulau Pinang were found to be suitable for part-time and full-time working adults, including UiTM lecturers and administration staff as part of their personal and professional development. Offering MC to educators for their professional development is similar to the approach done by Digital Promise in the United States (Acree, 2016, DeMonte, 2017). Additionally, MC certification programmes will be offered to current and future students interested in enrolling for added credentials. Current UiTM students could build their competitive advantage by registering in MC in addition to their existing conventional degrees. They have the flexibility to enrol in a MC module of their choice, which might be different from their

discipline (e.g., engineering students taking MC module related to social science). MC modules can also be offered as an elective to the current students. When these students graduate, they will earn their academic degree transcript and the digital badges earned via MC; these could increase their employability. Although some employers may associate MC with professional development certificates, having additional credentials is certainly a bonus for the job applicants.

Having several branches throughout the country is a strength of UiTM, which allows them to adapt or adopt the MC approaches similar to other MC providers or offer a unique approach to MC. The branch campuses could collaborate to develop and offer on-demand MC modules according to their niche areas. Additionally, UiTM can form a consortium with other private and public universities in providing a cutting-edge MC certification programme. Instead of competing against each other, these higher education providers can work together and offer MC that is industry demand-driven and allow credit transfers, particularly for stackable MC programmes. For example, students can take modules from UiTM and other universities within the consortium based on their preferences. If the student wants to earn a formal degree from UiTM, they can do credit transfers for modules taken from other universities. The decision to make specific modules required or optional depends on the agreement between the universities while adhering to the guidelines by the professional bodies (e.g., MQA), but then, such flexibility will open up more opportunities and attract more potential learners. To enhance the value of MC, UiTM should partner with industries and professional organizations to ensure they develop MC modules based on the skills and competencies required by the industry. If successfully promoted, MC will transform the Malaysian education system to the next level.

7. Conclusions and Recommendations to Stakeholders

This paper reviews relevant literature related to MC in the global and Malaysian context. The authors also discussed the challenges and opportunities in developing and offering MC to the international and national markets. Because not much empirical research is found, there are many unexplored research avenues related to MC and digital credentialing for future research. This paper can assist higher education providers interested in pursuing MC and future researchers who want to conduct MC and digital credentialing research from multiple stakeholder perspectives.

Based on the reviews, the MC certification programme's success depends on the various stakeholders (i.e., learners, educators, universities, MC providers, employers, regulators). Support from the Ministry of Education Malaysia and the MQA as the regulators is needed in providing guidelines and assistance to ensure the MC offered is well-accredited and employability-driven. Additionally, higher education providers and MC providers should have a clear guideline to avoid any vagueness of MC implementation processes. The marketing effort will be the utmost important aspect in making their modules distinct from other competitors. Competent personnel with IT backgrounds to monitor the online learning platform and maintain the digital badge system are essential and regular training and systematic control processes to ensure a consistent, high-quality MC certification programme is offered. It is also highly recommended that operational decisions by consensus could be reached involving types of metadata included within the digital badges and the traceability or validation mechanism. The portability of the digital badges is vital to ensure the marketability of the MC certification programme worldwide.

With all the opportunities and benefits mentioned earlier, employers should see the value of MC and consider accepting digital badges as a valid certification in a job application and added value to employees' personal and professional career development. Employers should also build trust with the credentialing process since earning the digital badges indicate learners' accomplishment on the learning processes through rigorous assessment and careful validation by the MC providers and the MQA. For employers who are perhaps the mutual beneficiaries of their employees' professional growth, the MC certification programme verifies skills beyond traditional degrees. Thus, employers could take this opportunity by providing a model for personalized learning tailored to their needs, which in some cases may serve as an opportunity to attract talent. Overall, cooperation and collaborations between stakeholders are needed to support the Malaysian government's agenda in transforming higher education.

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