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Proposed Typology and Inter-university Collaboration Model for Designing and Implementing Micro-credentials in Japan and the Philippines

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Abstract

The Fourth Industrial Revolution and the internationalization of education require educational institutions to develop creative and innovative programs that are relevant and responsive to the needs and context of the people. This study proposes an inter-university model for designing micro-credentials in various fields in Japan and the Philippines. The proposed model is drawn from the experiences and expertise of three collaborating universities from Japan and the Philippines. The collaboration model also advocates micro-credentials that are designed based on the expressed needs of the potential learners and stakeholders, the expertise of faculty members, available resources, and the mandates of the universities. The study also proposed a typology for classifying micro-credentials which is useful in crafting policies in the design and implementation of micro-credentials. The proposed typology is beneficial in identifying expectations, learning outcomes, contents, delivery modes, and assessment, and in developing a credit system for micro-credentials.

Keywords: Micro-credential, typology of micro-credential, inter-university collaboration, higher education

Introduction

The design and implementation of micro-credential are fast becoming a major trend and innovation among higher education institutions (HEI) worldwide (Brown, Mhichil, Beirne, Mac Lochlainn, 2021) and considering the demands of the Fourth Industrial Revolution in Education (FIRE) to provide flexible learning programs to

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respond to diverse non-traditional learners from various sectors of society as the FIRE continues to post immense demands and challenges to HEIs, traditional degree programs need to be revised to meet the needs of society. The economy's demands on human resources who possess specialized skills and multiple credentials necessitate HEIs to innovate and create short-term courses focusing on 21st Century needs and context. With the advent of the Fourth Industrial Revolution, the growing interests and advocacies in lifelong learning, the growing industry demands, and the influence of technology in promoting quality and accessible education, micro-credentials are starting to beef up in the Asian region.

The increase of literature concerning micro-credentials over the last few years reveals that it is gaining growing recognition. The attention it is getting today is similar to the hype and hope MOOCs (massive open online courses) received a decade ago (Brown et al., 2021a). Especially since the pandemic, interest in the potential of micro-credentials accelerated because of the need of individuals to find a new career, to reskill and upskill themselves so that they may fulfill their vocational responsibilities in the new normal, or quickly become skilled members of the workforce for rapidly changing industries (Wisemann, 2021; Desmarchelier & Cary, 2022). McGreal and Olcott (2022) also argue that the decline in student enrollment made universities expand their offerings beyond the typically granted degrees.

The concept and practice of awarding micro-credentials is not new (Oliver, 2019). In Canada, for instance, training bundles on basic first aid have already been offered since 1833 (Brown & Nic-Giolla-Mhichil, 2022, p. 941). Despite its long history, however, there is no global consensus on how "micro-credentials" is defined (Oliver, 2021), which makes the field "confusing and bewildering to navigate" (Rossiter & Tynan, 2019, p. 2). Although there are similarities among offered definitions, there are many competing viewpoints on what it is (Brown et al., 2021b), partly because, as a subject of scholarship, the field is still evolving and changing (Kazin & Clerkin, 2018). Another reason for the confusion is that micro-credential, as a term, is used to describe both individual courses and entire learning programs (Wang et al., 2020). Some terms have been associated with micro-credentials, which include "digital badges," "online certificates," "alternative credentials," "nano-degrees," "micro-masters, etc. that are awarded upon completion of a training module (Brown & Nic-Giolla-Mhichil, 2022, p. 940; Clements et al., 2020), but these only further convolute the discussion concerning how micro-credentials may be defined.

According to Kato et al. (2020), micro-credentials were first popularized in the United States "to draw a contrast with credentials traditionally conferred by HEIs after study programmes" (p. 8). These alternative credentials to macro-credentials, therefore, are a means to equip practitioners with the necessary skills for their trade in a way that is inexpensive, quick, and accessible. With these in mind, the European Commission's

Higher Education Consultation Group on Micro-credentials proposed a definition to address the need for a common language on micro-credentials: "A micro-credential is a proof of the learning outcomes that a learner has acquired following a short learning experience. These learning outcomes have been assessed against transparent standards" (European Commission, 2020, p. 10). The recent study conducted by Varadarajan et al. (2023) revealed a shared agreement that micro-credentials are

> shorter forms of a learning experience as compared to that of formal degree programmes—[sic] as a stackable certification of assessed learning that is additional, alternate, complementary to, or a formal component of a formal qualification that emphasizes verified learning outcomes (p. 7).

The growing interest in micro-credential is driven by the demand to innovate and make education relevant and responsive to industry needs and demands (Alamri et al., 2021). Micro-credentials are experience-based, practical, experiential, competency-based, and industry-driven (Wheelahan & Moodie, 2021, Selvaratnam & Sankey, 2021). They are short-term courses, narrow in scope, stand-alone, or stackable, that could lead to formal qualifications. So micro-credentials have multiple pathways depending on the needs and interests of the learners. Micro-credentials are changing the landscape of Philippine education by making education more practical and meaningful.

What is clear is that micro-credentials are the latest fad about continuing education, lifelong learning, industry relevance, employability, and professional progressivism (Wheelahan & Moodie, 2021). Whether micro-credentials are viewed as an alternative, supplement, embedded, new pathways, or bridges to formal mainstream education (Brown & Nic-Giolla-Mhichil, 2022), the crux of the matter is that micro-credentials are now being offered even by higher education institutions as part of their educational mandate. One of the many advantages of the active involvement of HEIs in this is that individual micro-credentials, when stacked, may count toward getting a formal qualification such as a certificate, diploma, or degree (Kato et al., 2020). Those seeking individual certifications and those hoping to receive a formal degree later may benefit from the micro-credentialing system.

In general, micro-credentials have the potential to help people stay up with the rapid rate of societal knowledge change, prepare for the demands of the future workforce, and give disadvantaged people access to credentials that acknowledge their skills and open doors to employment (Ifenthaler et al., 2016). The student-centered and skills-based approach of micro-credentials also allows students to focus on personalized learning, self-efficacy, and self-actualization (Hunt et al., 2020). In addition to these, as Varadarajan et al. (2023) noted, micro-credentials also increase flexibility in learning, promote lifelong learning, increase employability, and help individuals develop 21st-century skills (p. 8).

The disappointment of employers that universities are not producing competent and skilled graduates is also an important foundational justification for the popularity of micro-credentials (Oliver, 2019). Cote and White (2020) wrote:

> Traditional teaching and learning models have not adapted adequately to changing
>
> student demands and labor market needs. Higher education—particularly the university
>
> sector—has been confronted with a growing list of critiques to the still-dominant, campus-focused program models: long and relatively inflexible programs; inadequate recognition of prior learning; slow or limited innovation in pedagogy; insufficient student supports for career-readiness; weak alignment to labor market needs; and a limited commitment to online and digital-enabled learning (p. 8).

Because "frontloading skills and competence through our schools and universities is not sufficient to prepare active and well-educated citizens for the rapidly changing nature of work and actively participate in building a more sustainable future" (Brown et al., 2021c, p. 2), the government of Ontario, Canada is justified in declaring that micro-credentials will allow individuals "to upgrade their employment-related skills quickly and efficiently and remain competitive in the workplace, while at the same time accommodate the demands of work and family" (Government of Ontario, 2020). Therefore, the primary advantage of micro-credentials is that they offer a different and complementary approach that is more adaptable, inexpensive, and accessible. For Oliver (2019), this is precisely what twenty-first-century learners need and prefer.

Waiting for four years or more for students to finish their degrees is no longer efficient. HEIs should address the mismatch between the industry's needs and demands and the skills of the graduates. Also, the drive for student and faculty mobility and the growing public call for greater access to education also demands HEI to provide opportunities where learners and faculty members can access more educational opportunities where they could participate and collaborate.

Method

This study uses data gathered during the series of meetings, visitations, presentations, and situational analysis done in the three collaborating universities in Japan and the Philippines. The study focused on the following objectives: (1) develop a

typology of micro-credentials that could be offered, and (2) propose an inter-university model for implementing micro-credentials.

The following procedures were done.

a. Situational Analysis – the current situation, developments, innovations, and challenges of higher education in Japan and in the Philippines were analyzed. Likewise, the needs and the initiatives of the collaborating institutions on micro-credentials were also discussed. Literature on micro-credentials was shared and studied.
b. Meetings and Dialogues – several meetings and dialogues were conducted in the Philippines and in Japan to present possible micro-credential programs and projects. Also, several opportunities for collaboration were discussed that served as opportunities to examine possible means of delivering the micro-credentials and what type of micro-credentials can be prioritized based on the expertise of the faculty.
c. Actual Visitation – the participating institutions conducted an onsite visit to the campuses to see the different facilities of the school and look at the various programs and research projects currently conducted in each school.
d. Analyzing the Data and Developing the Models – the results of the discussions and the themes during the presentations and meetings were analyzed and summarized, and the results were utilized to develop the models.

Results

The data were used to (1) develop a typology of microcredentials, and (2) propose a model for inter-university collaboration for designing and implementing microcredentials in the Philippines and in Japan.

Typology of Micro-credentials that could be offered in Japan and the Philippines

The offering of micro-credential is becoming a prominent trend in higher education. Micro-credentials are offered to address two purposes: (1) to address the skills gap between what industry needs and what the formal educational system produces, and (2) to promote lifelong learning among the people. The first focuses on developing technical skills and developing new credentials and competencies for the learners to participate in society's economic activities and gain employment in various industries.

The second type is to develop soft skills and advance the different interests of different people allowing them to choose to study different fields of interest.

The result of the discussion among professors and administrators from the universities involved in this project shows that there are emerging typologies of microcredentials that could be offered, and these typologies can be further classified into two: (1) horizontal) and (2) vertical typology. The proposed typology will guide the HEIs in selecting and designing the micro-credentials that will be offered. The first set, which is horizontal typology, deals with the purpose or the raison d'etre of micro-credentials, and under it are four types of micro-credentials that could be offered in the Philippines and in Japan based on the strength, mission, and expertise of the universities that will be offering micro-credentials. Table 1 shows the types of micro-credentials under the horizontal typology.

Table 1

Horizontal Typology of Microcredentials that could be Offered in Japan and the Philippines

Type	**Micro-credential for crediting Prior-learning**	**Micro-credential for learning new knowledge and skills**	**Micro-credential for upgrading professional qualifications and competencies**	**Micro-credential for lifelong learning**
Purpose	To recognize, credit, and upgrade prior learning and prior experiences	To provide an opportunity for everyone to develop new skills and knowledge from basic literacy to technical and vocational, professional and advanced competence	To respond to the demand for continuing education for professionals and to provide the needed requirements for renewing a professional license	To respond to the growing interests of the public in learning new things like cultural interests, and to develop skills and pursue learning new things that are interesting to them
Delivery Mode	Flexible learning	Flexible learning	Flexible learning	Flexible learning
Assessment	Non-formal assessment,	Performance-based and actual	Performance-based and work-based	Actual demonstration of

	project-based, solutions & innovations done, impact & contribution, years of experience	demonstration of learning, project-based, competency-based	assessment, competency-based, practical, and written examination	learning, competency-based
Credit System	Number of Learning hours, competencies mastered, Rigor of Learning, Proficiency	Number of Learning Hours, Level of Competencies, Professional Tests, Result of Actual Assessment, Recognition from different agencies	Number of Learning Hours, Contents and number of modules finished, Level of Competencies, Professional Examinations, Result of Actual Assessment, Formal recognition from the professional regulation agencies	Number of hours spent learning, number of modules finished, Proficiency and level of knowledge, Recognition from social institutions, schools, and industry partners
Certification System	Paper Certification System, Digital Badge System	Paper Certification System, Digital Badge System	Paper Certification System, Digital Badge System	Paper Certification System, Digital Badge System

The first typology of micro-credential is for recognizing prior learning and prior experiences. This type of micro-credential recognizes the talents, skills, and knowledge previously accumulated by the learners and provides an opportunity to upgrade them. It is useful for skilled workers, artists, musicians, community leaders, and other gifted and talented learners. In this typology a micro-credential is recognized by individuals, and educational institution providers recognize micro-credential as a legitimate outcome of learning or evidence of competence either credited by other institutions or attained in the workplace and in other forms of informal education. Former professionals and skilled workers who gained immeasurable skills and knowledge from the Philippines and Japan due to their working experiences, training, and exposures could benefit from this type of micro-credential. The current undergraduate and graduate students who have background knowledge or prior experiences in various areas and fields may also take advantage of enrolling in this type of micro-credential. The credit system to recognize

this typology of micro-credentials will examine the number of learning hours spent for each micro-credential, the competencies mastered, the rigor of learning, and the learners' proficiency level.

The second typology of micro-credential is for learning new skills or gaining new knowledge in certain areas and fields. Soft skills, metacognitive skills, technical and vocational courses, and specific specialist professional skills and competencies fall under this typology. Some of the micro-credentials that will fall under this typology could be related to ICT skills, entrepreneurship, tourism management, hospitality services, engineering skills, health sciences, creative arts and media, language, leadership, decision-making, problem-solving, planning tools, and innovation skills, among others. The learners took these types of micro-credential to gain employment or to add more credentials. Entrepreneurs could also take these micro-credentials to start a business. Business companies and public and private institutions can soon request for the design and development of micro-credentials needed for their employees. The Filipino professionals working in Japan, like nurses, teachers, engineers, and skilled workers working in Japanese companies located in the Philippines and Japan can possibly take this type of micro-credential. University students from different colleges could also enroll in this type of micro-credentials to learn new knowledge and skills that will enhance their credentials. The credit system for this typology is done by looking closely into the number of learning hours spent for each micro-credential, the level of competencies, results of professional tests, results of actual assessment, recognition from different agencies, and actual demonstration of learning.

The third typology of micro-credential is for upgrading professional qualifications and competencies. This set of micro-credentials is perfect for professionals who are required to attend and earn continuing education units to renew their professional license and for middle-skill workers and executives who wish to upgrade their qualifications and earn new credentials that could advance their career, be promoted to a higher position, or prepare them to new career prospects. The micro-credentials under this category could also be considered as stackable courses and can be credited to undergraduate or graduate courses or any micro or macro-degree. Current students and future students can enroll in this type of micro-credential. Likewise, Filipinos who wish to work in Japanese institutions and companies can also benefit from this type of micro-credential. This type of micro-credential will also allow the universities to collaborate with professional regulatory bodies and agencies to provide micro-credentials that will be used for renewing professional licenses and complying with their continuing education requirements. The credit system for this typology is based on the number of learning hours, number of modules finished, level of competencies based on the country's referencing and qualifications framework, professional examinations, results of actual assessment, and formal recognition from professional regulatory agencies.

The fourth typology is to address the lifelong learning needs of the learners. The micro-credentials under this typology are designed and selected based on the interests and needs of the learners. This typology could also cover the development of talents, abilities, and life skills or anything that falls under the learners' interests. The micro-credentials under this typology are short-term, particular areas of interest, and narrow in scope. Examples of this micro-credential are learning musical instruments, Japanese and Filipino cuisine, sports, dance, language, Ikebana, origami, and all types of topics and skills from various fields and disciplines that can be offered to the public. This type of micro-credential is perfect for responding to peoples' interests and concerns related to sustainable development goals, climate change, global warming issues, economic challenges, and demands, and understanding global and domestic political issues. Transferrable skills like critical thinking, and decision-making, among others could be included in this type of micro-credential. The credit system is done by evaluating the number of hours spent learning, number of modules finished, proficiency and level of knowledge, recognition from social institutions and industries, and level of mastery or proficiency of the learners.

The delivery of instruction is done in a flexible learning mode which means the micro-credentials will be taught through either one or a combination of residential instruction (face-to-face), online, hybrid or blended learning, flipped learning, distance learning, and adaptive learning. The learners have the choice of pace, place, and learning mode. Since the digital divide is an immense challenge in the Philippines compared to Japan, traditional modes of instruction like modular instruction will be used. The use of modular and face-to-face instruction will also provide greater access for indigenous people in the Philippines to enroll in the micro-credentials developed by the universities. To further increase access to these micro-credentials, use available learning management systems and other learning platforms. There will be synchronous or asynchronous sessions like in all flexible learning modes.

Assessment of these micro-credentials is challenging for educational providers. The development of rubrics and innovative approaches and using technologies will be crucial in supporting the credibility, validity, and stakeholders' acceptance of the micro-credentials. The system for recognizing micro-credentials by awarding of certificates of completion indicating (1) awarding institution, (2) level of competencies based on the country's referencing and qualifications system, (3) number of hours or duration for the completion of the micro-credential, and (4) the equivalent units or credit if the micro-credential earned is stackable. A digital badge system can also be utilized after the completion of each micro-credential.

The second set is a vertical typology of micro-credential based on the structure of the micro-credentials. There are two types of micro-credentials under this typology (1) stackable, and (2) stand-alone.

Table 2

Vertical Typology of microcredentials that could be offered in Japan and the Philippines

Type	Stackable Micro-credentials	Stand-alone Micro-credential
Definition	To be credited or bundled into formal degrees or other forms of macro-credentials	To be offered as micro-credential for specific skills or on a specialized topic without the purpose of crediting it to a formal degree
Delivery Mode	Flexible learning	Flexible learning
Assessment	Performance-based, project-based, work-based assessment, portfolio-based assessment, and competency-based. Students may also take written examinations depending on the competencies	Actual demonstration of learning, competency-based, project-based, portfolio-based assessment
Credit System	Credit based on the number of learning hours, Type of content and number of modules finished, Level of Competencies, Professional Examinations, Result of Actual Assessment, Formal recognition from the higher education institutions	Number of hours spent learning, number of modules finished, Proficiency and level of knowledge, Recognition from social institutions, schools, and industry partners
Certification System	Paper Certification System, Credit units and grades to appear in the Transcript of Records, Digital Badge System	Issuance of a certificate of completion, Digital Badge System

Stackable micro-credentials could be credited into a course and pulled together to earn a formal degree. Bailey and Belfield (2017) pointed out that stackable credentials allow individuals to progress on a career path, enhance the labor market prospects of middle-skill workers, or allow individuals to complete a degree. Professionals, undergraduate students, and graduate students who wish to take formal degrees and qualifications from the Philippines and Japan can take advantage of this micro-credential type. The stand-alone micro-credential on the other hand are offered independently without the purpose of earning credit units for a degree program or a

course. They are designed to master specific skills and specialized content, and for responding to the lifelong learning needs of all people.

Micro-credentials are inclusive in terms of the type of learners who can enroll. It is open to all types of learners. There are two types of learners who could possibly enroll in these micro-credentials: (1) the non-traditional learners which could be adults, professionals, graduates of alternative learning systems, entrepreneurs, businessmen, senior citizens, government workers, and all people who wish to be engaged in meaningful lifelong learning, and (2) the current undergraduate and graduate students in the university who would like to pursue their interests, learn new skills and knowledge, or add new credentials that will boast their qualifications.

Inter-university Model of Collaboration in Implementing Micro-credentials

Figure 1.

Inter-university Model of Collaboration in Implementing Micro-credentials

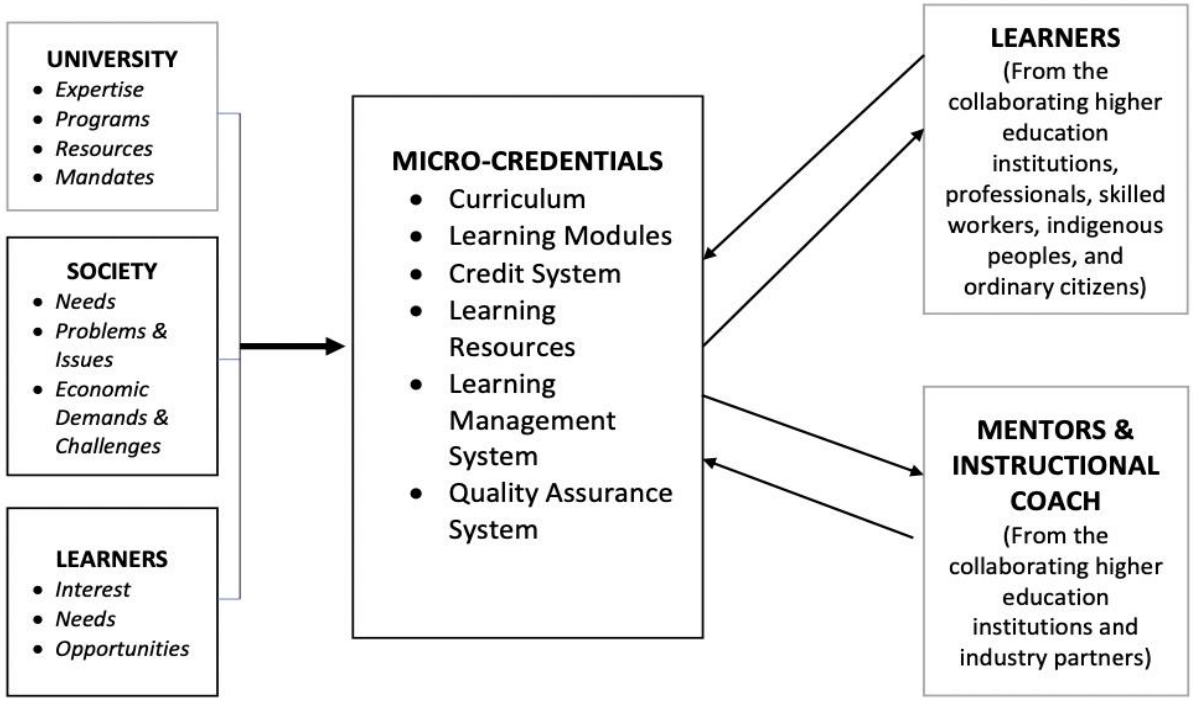

Figure 1 shows the proposed inter-university model of collaboration in implementing micro-credentials in Japan and in the Philippines. The design, development, and implementation of micro-credentials commence with careful and deliberate planning starting with identifying the universities' expertise, academic programs, resources, and mandates. Whether stackable or not, microcredentials should emanate from the expertise and excellent experiences of the higher education institutions involved. Whether the micro-credentials are designed to meet industry needs and demands and to promote lifelong learning among the people, the HEIs need to examine the needs, issues, problems, and economic demands and challenges.

The micro-credentials should also consider the learners' interests, needs, and interests of the learners, including the available opportunities for them (Pawilen, Lubong, and Fausto, 2023). The learners are non-traditional learners with various educational backgrounds and experiences. They come from different HEIs; they are fresh graduates of the K-12 program, they are professional workers, skilled workers, or daily laborers, and they are indigenous people and ordinary citizens. Micro-credentials should be inclusive so they could be accessible to all types of learners regardless of gender, age, and ethnicity. It is imperative that micro-credentials should be relevant and responsive to the needs of society and the learners.

After considering the three influences and sources (university, society, and learners), the collaborating HEIs should design the curriculum for each micro-credential, develop the modules, agree on the credit system, especially for stackable courses, prepare for the learning resources, select the learning management system that will be used, and design a quality assurance system that will be used in assessing the micro-credentials both internal and external. The QA system is essential in ensuring the sustainability and quality of the micro-credentials to be offered.

The mentor and instructors play a significant role in designing and in implementing the micro-credentials. They need to have the necessary experience and expertise in a particular micro-credential that they will handle. Since micro-credentials are practical and competency-based, instructors and mentors must model these competencies to potential learners. Industry partners and alumni could be tapped to become mentors and instructors. University professors and researchers could share their research experience and expertise, while the university extension specialist can also develop a micro-credential based on their experiences in the field.

During the discussions and meetings, there is a realization among the faculty and administrators from the participating universities that micro-credential could be a significant game changer in the traditional degree programs of all higher education institutions for the following reasons:

a. Millennial learners who wish to have quick skill and competency-based credentials may opt not to enroll in a college degree anymore. The micro-credentials can ensure a job that fits their skills and competencies.
b. Higher education institutions will enhance the implementation of outcomes-based education in all the academic programs they offer to ensure alignment with stakeholders' needs and with the demands of society.
c. The completion period for traditional degree programs may be shortened
d. The curriculum will no longer be prescriptive in terms of courses to be taken by students. Instead, it will be descriptive where students could choose their courses and outcomes-driven
e. Students will have broader options to enroll in the university
f. Integrating micro-credentials will surely change and reshape traditional courses' pedagogy and learning environment to become more learner-centered and competency-based.
g. Assessment will have more options. Project-based, actual demonstration of learning and involvement of community partners and industry in the assessment of students will be integrated.
h. A modular approach to designing courses, especially those that could be offered as micro-credentials and stackable courses, could be done.
i. The development of credit systems, equivalency, and recognition of micro-credentials can be developed.
j. In the absence of an advisory or policy for micro-credentials both in Japan and the Philippines, it is essential to develop a quality assurance system that will guide the design, implementation, and evaluation of the quality of micro-credentials.

The participating institutions from Japan and the Philippines need to develop a coherent strategy for harnessing the best practices and benefits of micro-credential learning not only to effectively respond to the growing needs of professions, industry, and the community but also to create innovations and improve the curriculum and delivery of traditional degree programs and courses in higher education.

Case Studies on the Experiences of the Collaborating Universities in Designing and Implementing Micro-credentials

The following case studies discuss the success stories of the collaborating universities in offering micro-credentials. The case studies are some of the sample micro-credentials and they include the purpose and content and provide the background for offering the sample micro-credentials. They also describe the experiences during the implementation of the micro-credentials and identify the lessons learned and the

contribution of the micro-credential to the participants, to the schools, and to the wider spectrum of the education system.

Table 3 is a case study of a micro-credential that was designed by the University of the Philippines Los Banos to train faculty members and school administrators to understand what micro-credential is and how it should be designed and implemented. This micro-credential was instrumental in popularizing microcredential system among universities and colleges in the Philippines. This micro-credential is an example of a micro-credential to develop new knowledge skills and it is stackable. This course could be credited as part of a graduate course. Currently, this program is still offered to different universities and colleges in various parts of the country.

Table 3

Case Study 1.:Designing Micro-credentials for Teachers and Administrators (Level 1)

Purpose: This micro-credential course was designed for teachers and administrators from various universities and colleges in the Philippines. It is a 3-days course that aims to provide basic knowledge and skills in designing and implementing micro-credentials.

Content: This micro-credential course includes 4 modules: (1) Understanding Micro-credentials, (2) Designing Contents for Micro-credentials, (3) Assessment of Learning in Micro-credentials, and (4) Quality Assurance for Micro-credentials.

Background: In 2018, there was already a growing interest and discussions among academic institutions in the Philippines about the future design of education especially curriculum in the Fourth Industrial Revolution. Terms like flexible learning, AI in learning, flexible curriculum, micro-degrees, and micro-credentials began to catch the interest of higher education institutions. UPLB, as part of the national university system, aims to help in the future-proofing of higher education institutions by providing capacity-building activities related to leadership development, curriculum development, research and publication, faculty and staff development, and extension. The clamor to understand micro-credential and how to design and implement it among universities and colleges began. Hence, the UPLB responded to this need and the micro-credential on "Designing Micro-credentials for Teachers and Administrators" was developed and offered to several public and private universities and colleges. The goal was to capacitate these universities and colleges in designing and implementing their own micro-credentials based on their expertise, program offerings, and mandates.

Experiences: This micro-credential was empowering and engaging to all the participants. The discussions and activities were very practical and experience-based. The faculty members and administrators who

participated in these micro-credentials were encouraged and guided in creating sample micro-credentials and examining how the micro-credential system could be integrated into their university and college system. They were trained to put their passion, experience, and expertise in every micro-credential they developed. The participants were also taught to reflect and ensure that every learning activity and discussion they put in each micro-credential. Everything should be purposeful and mentally engaging.

To differentiate their learning experience in the micro-credential course from their graduate school experience, all the learning activities and lectures used critical pedagogy, creative pedagogy, and empowering education models of learning. There is an actual demonstration of learning, critical reflection, and active learning in every session. All need to participate, discuss and work on something individually or collaboratively. Every participant is encouraged to be innovative and creative. Every output was individually submitted online, and every participant was instructed to ask the comments of their peers or ask someone to evaluate the quality and relevance of their output, before finally submitting it to the instructors for final assessment and evaluation. The participants were also given assignments that they can accomplish at home, or asynchronously with their classmates.

At the end of the four modules, there was a period of synthesis and evaluation where the participants shared what they learned, insights, and commitments. Each participant was awarded a certificate of completion and a recognition that this micro-credential they completed will gain equivalent units in the graduate course in the professional master's degree of their universities. The crediting of the micro-credential was worked-out with the graduate schools from the participating universities and colleges. In short, this micro-credential is stackable.

Lessons Learned: The offering of this micro-credential is a successful story, and there are several lessons learned in the implementation of this micro-credential:

1. The micro-credential to be offered should be needs-based. In this case, many universities and colleges started to request to enroll their faculty and administrators in these micro-credentials. They saw the need and the importance of micro-credentials in making their programs relevant and responsive.
2. The learning outcomes should be related to the needs and expectations of the participating universities and colleges
3. The micro-credential should be competency-based and experience-based. All the learning experiences are head-on and hands-on.
4. The micro-credential should be empowered by training them to apply what they learned in their schools. In this case, they were trained to become course designers and implementers.
5. There is a need to develop an equivalency and credit system for micro-credentials
6. There is a need to do research on the gains and successful stories of the micro-credential system

Contribution: This micro-credential was offered to four higher education institutions, and it served as the foundation for the creation and establishment of the first four institutes for lifelong learning in the country

that are now active in pursuing projects and programs relevant to the microcredential system here in the Philippines and abroad.

Table 4 is a case study describing the experience of Ehime University in offering a micro-credential course for their students to develop positive relationships with local schools and local school boards. This is an example of a micro-credential for lifelong learning, and it could be a stand-alone or stackable.

Table 4

Case Study 3. Friendship Program with Local Schools and Local School Boards

Purpose: At Ehime University, micro-credentialing has not yet begun. However, some previous educational opportunities we have provided for the community are closely related to micro-credentials. In this report, one of the authors describes a past professional learning course provided for in-service teachers to consider how we can improve the professional development system in Ehime Prefecture from now.

Content: The program consisted of three parts: 6 hours or more in required areas, 6 hours or more in required elective areas, and 18 hours or more in elective areas. Universities and school boards offered the license renewal courses throughout the country. The author participated in the program as an instructor, teaching a portion of the required areas, specifically student counseling, and a course on designing a problem-based learning unit for K-12 students as part of the elective areas.

Background: The teacher license renewal system was designed to ensure that teachers regularly acquire the latest knowledge and skills so that they can maintain the necessary qualifications and skills. In principle, teachers were required to apply to the license administrator for renewal after attending and completing a license renewal course of 30 hours or more offered by universities or other institutions between 2 years and 2 months before the expiration date in every decade. In July 2022, the new law eliminates the teacher license renewal system by deeming that regular and special licenses do not have a specified expiration date and removing provisions related to the renewal system. The new training system will start in April 2023. In order to improve the qualifications of teachers, the appointing authority shall prepare records of professional training.

Experiences: In general, the following points were often mentioned as challenges for the school system: (1) the complexity of the system caused many cases of unintentional license expiration, (2) the high burden on teachers in terms of cost and time required to participate in the training, and (3) the system significantly discouraged license holders who were not currently working in schools from returning to the teaching

profession. Ehime University contributed as the only training provider in the prefecture while the license renewal system was effective. Despite the negative reputation of the programs offered by some universities, most of the teachers who participated in the courses offered by Ehime University gave positive evaluations of their courses in general. We, the professors at Ehime University, are proud of the credibility we have gained in the region.

Lessons Learned: In terms of relatedness to micro-credentials, I can distill lessons learned from our practice as follows.

a. Professional update on the side of teacher educators: To prepare a quality professional development experience in the program, the professors who taught there needed to keep their understanding of national public education policies up to date. Furthermore, the understanding should be properly situated in real challenges observed in local schools.

b. Openness for degree completion: At that time, almost no professors recognized the concept of micro-credentials, in which collected credentials from a variety of programs offered by different institutions at Ehime University are stackable. The Ministry of Education conceptualized the license renewal course as a single-function opportunity for renewal. However, considering the current concept of micro-credentialing, the renewed knowledge and skills in the program are subject to the part of possible degrees in the future.

c. Effectiveness of evaluation: Although the participants' evaluation was generally positive, most of the courses in the required areas were conducted as one-way lectures. Therefore, the learning evaluation would naturally not be performance-based. If we implement a valid performance-based evaluation, the knowledge, and skills they learn should be integrated into a more meaningful professional learning project with responsive feedback by teacher educators along with project development.

d. Continuity of learning with digital technology: To establish continuous professional development for teachers in Japan, school boards should support the lifelong professional development of teachers with an appropriate type of learning record for each teacher. Universities can support their efforts by offering digital technology such as blockchain digital badges.

Contribution: In the future, a micro-credentialing framework with related digital technology such as blockchain would support the lifelong development of teachers. Once we establish such an environment, what an in-service teacher has learned will not be limited to updating his or her knowledge and skills. By collecting credentials and applying to graduate schools, the teacher can open up new other careers such as teacher educator. To contribute to society in this way, an institution must be equipped with a flexible and effective micro-credentialing system to certify learners' accumulated credentials from a variety of learning opportunities around the world. When many teachers enter such a cycle of continued professional development, their students would benefit tremendously in their learning experience.

Table 5 is a case study offered by Wesleyan University Philippines to train Filipino Protestant school teachers on how to effectively teach Christian Living in their schools. This micro-credential belongs to the third typology which is a micro-credential

for upgrading professional competencies. Depending on the students, this micro-credential can be stand-alone or stackable.

Table 5

Case Study 3. Strategies for Teaching Christian Living

Purpose: The 2-day micro-credential course was designed to equip educators with effective instructional techniques, pedagogical approaches, and resources to teach Christian living in Basic Education. One of the major foci of the course was to guide students to write learning activities and assessments that are consistent with existing content and performance standards for Christian Living.

Content: The micro-credential included 4 modules: (1) Designing Learning Competencies and Designing Instructional Plans for Christian Living, (2) Christian Stewardship: Standards, Learning Strategies, and Assessment Tools, (3) Discipleship: Standards, Learning Strategies, and Assessment Tools, and (4) Christian Leadership in the Curriculum: Standards, Learning Strategies, and Assessment Tools.

Background: In June 2021, the need for a Christian Living curriculum was discussed by the member institutions of the Association of Christian Schools, Colleges, and Universities (ACSCU). In the same year, a committee was formed to address this. A conference was organized to provide an avenue where experts and practitioners may engage in meaningful conversations about designing a Christian Living curriculum for Basic Education. After the conference, a committee was formed, composed of members from several basic education institutions in the country, to draft the framework of the curriculum. After several consultations, the framework was adopted by ACSCU. The next step was then to write the content and performance standards of the curriculum, which were completed after a series of workshops with experts, educators, practitioners, and church ministers. The micro-credential course was held in December 2022 to equip Christian Living teachers with the skills to write the appropriate learning activities and assessment methods of the curriculum. The objective was to enable teachers coming from different Christian traditions to write their own learning and assessment activities that are faithful to their theological tradition and institutional mission and vision.

Experiences: The micro-credential was attended by an intimate number of participants from several Christian basic education institutions. Four resource experts facilitated the discussion and activities, which were practical, and experience based. The attendees wholeheartedly participated in the discussion, and group-based activities, and in sharing their output with the entire group. The participants were challenged to think creatively and critically in choosing which learning activities and assessment methods they must employ, in consideration of their own unique institutional priorities and denominational commitments. Because of the sharing time, participants learned from each other, and their group's output was further enhanced by the insights of their fellow learners.

In the course, several experiences were intentionally pursued. First, the participants explored methods to integrate faith and biblical principles into various subjects and learning experiences, fostering a holistic understanding of Christian living. Second, strategies were shared to enhance student engagement in Christian living, including interactive lessons, discussions, group activities, and reflective practices. Third, participants learned techniques for intentionally cultivating character traits such as empathy, compassion, integrity, and resilience in students. Fourth, participants delved into approaches to promote biblical literacy, equipping students with a foundational understanding of Scripture and its relevance to Christian living. We emphasized the centrality of the Bible and its message in crafting lessons, activities, and assessments. Fifth, participants explored ways to facilitate spiritual growth in students through prayer, worship, discipleship, and fostering a personal relationship with God. The centrality of Jesus Christ was emphasized in the curriculum.

Throughout the course, the participants engaged in discussions and collaborative activities. This hands-on approach allowed them to actively explore and exercise their creativity in writing. The participants were also encouraged to reflect on their own teaching experiences and consider how their proposed activities and assessments could be applied and adapted to their unique contexts. Finally, the participants benefited from opportunities to share experiences, exchange ideas, and collaborate with fellow educators. This collaborative environment facilitated the sharing of best practices and the building of a supportive professional network.

Lessons Learned: The micro-credential awarded to the participants was well-deserved. The students actively participated in the sessions and performed the tasks assigned to them. The output they submitted shows evidence that the learning outcomes of the course were achieved. Several lessons or reflections may be enumerated. First, micro-credentials are best offered to a small group of participants, so that active participation and engagement are warranted. Large-sized groups will now allow close interactions with the facilitators and other participants. Second, an activity-based approach is more relevant to students who are already professionals in their own fields. The minimal number of hours spent on discussing policies, principles, and theories, in order to give way to more reflective engagement, creating an environment of fun and active learning. Third, expected outputs from students do not necessarily need to be postponed a few days after the end of the sessions. Learning activities during the sessions that deal with the expected output are important because real-time feedback from the facilitators and other participants is very helpful in enhancing existing works. Finally, being faithful to the learning outcomes of the micro-credential is important. Ensuring that the topics and learning activities are consistent with the announced outcomes will enable participants to gain the competencies that the course promised.

Contribution: The micro-credential equipped teachers with the knowledge and skills to write learning and assessment activities creatively, critically, and competently for Christian Living that is contextually sensitive and relevant. The course demonstrated the importance of ongoing professional development to support the effective teaching of Christian living.

The case studies provided a glimpse of the real experiences of implementing micro-credentials. The collaborating universities and all other higher education institutions offering micro-credentials can learn from these experiences and best practices. Likewise, sharing of micro-credential programs, resources, and faculty members could also be done.

4. Conclusions

Micro-credentials will continue to shape the landscape of formal, non-formal, and informal education anywhere in the world. The design, development, implementation, and evaluation of micro-credentials will continue to evolve in consideration of the changing needs of the people and society. The integration of micro-credential into the system of higher education will significantly influence the direction of teaching and learning of the traditional degree programs that are offered by colleges and universities. The micro-credential system will be a major game changer in higher education around the world in the future. The models for inter-university collaboration will define the roles of participating institutions. The perceived influence of micro-credentials in education also needs to be addressed.

The proposed typology will evolve, and micro-credentials will continue to be enhanced and grow as new demands for continuing education, skills development, human resource development, and lifelong learning emerge. The proposed typology is also very useful in designing micro-credentials and it can be used by the higher education institutions and the ministry of education in both countries to craft policies and advisories that will guide higher education institutions in developing and implementing micro-credentials. It could be used to identify which type of higher education institutions could best offer any of the typology of micro-credentials.

The experience of designing and implementing micro-credentials led to the conclusion that if the micro-credential system will be fully integrated into the traditional formal system of education, the former will need to change and evolve to embrace some degrees of flexibility and adopt a culture of creativity and innovation. The years to finish a formal degree could be shortened, the current course offerings will be fully competency-based and outcomes-based, the learning experiences will be more engaging and practical than theoretical, and the assessment of learning will include work-based assessment and other non-traditional assessment tools. Certification and recognition will take either paper-based certification or digital badges and taking a form of education degree will be less of a priority for every learner. The learning environment will be fully inclusive and adaptive.

Finally, in consideration of the different needs and demands of the Fourth Industrial Revolution (or the Fifth Industrial Revolution), the participating universities will continue to seek efficient ways of designing, implementing, and evaluating micro-credentials that are human-centered and needs-based. Micro-credentials will continue to widen access to education and improve the quality of education not only in both countries but around the world. The collaboration between higher education institutions in Japan and in the Philippines is a good start to sharing best practices and innovations in the design and implementation of micro-credentials. Furthermore, as more universities and colleges will likely collaborate on micro-credentials in the future, a system of quality assurance for micro-credentials

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