Execution of Micro-Credentials in Malaysia: The Challenges and Readiness of Higher Education Leaders

Ahmad Aizuddin Md Rami[1*], Ismi Arif Ismail[2], Mohd Amin Sarman[3], Nurul Afiqah Zulkifly[4]

[1 2 3 4] Faculty of Educational Studies, Universiti Putra Malaysia,
43400 UPM Serdang, Selangor, Malaysia
ahmadaizuddinmdrami@gmail.com
ismi@upm.edu.my
aminsarman89@gmail.com
nurulafiqah@upm.edu.my
[*]Corresponding Author

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Abstract: In Malaysia, higher education institutions (HEI) have made significant efforts to integrate micro-credentials into their educational systems. However, the status of micro-credentials among these institutions remains ambiguous. Furthermore, there is a dearth of comprehensive research on university leaders within the context of public universities in Malaysia. The study was conducted to investigate the challenges and readiness in implementing micro-credentials by university leaders within higher education institutions (HEIs) in Malaysia. The research focused on public universities in Peninsula Malaysia and used a qualitative approach through a case study method. The study involved five informants who were university leaders from these institutions. In summary, this study focuses on the challenges and readiness of university leaders in implementing micro-credentials in Malaysian HEIs. The major themes that emerged from the findings represent these challenges. The study aims to shed light on the importance of university leaders' roles and perspectives in the successful integration of micro-credentials. For data collection and analysis, this study used semi-structured interviews and thematic analysis respectively. The data analysis led to the development of the major themes that emerged from findings include (i) application of micro-credentials, (ii) human resources, (iii) facilities and infrastructures, (iv) accreditation, and (v) accountability, referred to challenges faced by university leaders. By addressing these challenges, university leaders can contribute to the advancement of micro-credentials within the higher education system in Malaysia.

Keywords: Educational technology, Higher education, Leadership, Micro-credentials, Public University, University leaders

1. Introduction

The advent of the Fourth Industrial Revolution(IR 4.0) and the ensuing digital transformation have underscored the necessity for a higher education system that is both adaptable and rigorous. A significant aspect of this transformation is the emergence of micro-credentials as a viable alternative to traditional degree programs, offering a more flexible and targeted approach to skill acquisition and recognition (Ahmat et al., 2021). Micro-credentials, also known as digital badges, nano degrees, or mini-certifications, represent a modular and competency-based approach to learning, enabling individuals to acquire specific skills and knowledge relevant to their chosen fields (Duklas, 2020). By providing opportunities for individuals to upskill, reskill, and validate their competencies incrementally,

micro-credentials offer a pathway for learners to stay relevant and competitive in an ever-changing global economy (Bell et al., 2022). Desmarchelier and Cary (2022) and Oliver (2019) have highlighted the significance of micro-credentials in this context, endorsing their potential in cultivating a skilled workforce capable of adapting to the dynamic challenges of the modern labor landscape.

IR 4.0 has brought about profound changes in people's lives, heavily influenced by the rapid advancement of digital technology. Education, too, has not remained immune to this transformation, as it has become closely intertwined with digital sophistication. In preparation for the challenges posed by the IR 4.0, the cultivation of human potential stands as a crucial foundation for instigating a transformative shift across the entire educational workforce (Rumeli & Rami, 2023). This convergence has led to a revolutionary shift in teaching and learning methods, with the virtual realm emerging as a comprehensive and stable educational platform, presenting a plethora of possibilities.

The scholarly discourse surrounding the concept of micro-credentials has experienced a significant surge in interest, particularly in the aftermath of the COVID-19 pandemic (Brown et al., 2021). The pandemic's impact on student enrollment has led traditional universities to seek alternative approaches, prompting them to extend their educational offerings to non-traditional student segments and international learners situated in geographically distant regions (McGreal & Olcott, 2022). Addressing the shift towards online education, Wheelahan and Moodie (2021) suggest that micro-credentials present an avenue worth exploring.

Undoubtedly, the challenges posed by the ongoing process of digitization have compelled higher education institutions (HEIs) to adapt by introducing micro-courses, particularly to cater for the professional developmental needs of employees aiming to sustain competence within their respective roles (García Carrizo et al., 2021). Consequently, the significance of HE leadership and academic officers comes to the fore, as they play a crucial role in overseeing the management of policy changes concerning the integration of micro-credentials within HEIs. Understanding the perspectives of academic leaders, policymakers, and other relevant stakeholders is crucial in identifying the necessary steps for fostering a supportive environment for micro-credential implementation. As such, this study endeavors to contribute to the broader discourse on educational innovation and the future of HE in Malaysia.

In Malaysia, there have been notable endeavors by public HEIs institutions to adopt micro-credentials as part of their educational framework (Navanitha et al., 2022). This move aligns with one of the United Nations' Sustainable Development Goals: Quality Education. By embracing micro-credentials, educational institutions in Malaysia aim to create a more inclusive and equitable learning environment, wherein students from diverse countries and backgrounds can access equal opportunities to learn and participate in educational programs. This reflects a broader commitment to enhancing the quality and accessibility of education for all learners as stated in the Malaysia Education Blueprint 2015 - 2025. (Ministry of Education, 2015). The implementation of the Higher Education Digitization Plan in Malaysia has introduced various strategies aimed at promoting and empowering the digitization agenda in the country's educational landscape. One significant initiative is the integration of micro-credential courses.

The micro-credential movement in Malaysian HEIs is a recent development as formal accreditation strategies by the Malaysian Qualifications Agency (MQA) were introduced in 2019 (Malaysian Qualifications Agency, 2019). Responding to the dynamic challenges of the digital era, the higher education landscape in the country has exhibited sensitivity and proactivity. In light of this, MQA has developed a guideline entitled "Guidelines to Good Practices: Micro-credentials" for good practices. The guideline serves as a fundamental principle to be adhered to by higher education providers in Malaysia. They aim to assist institutions in formulating, designing, and implementing micro-credentials effectively. The publication of the guideline signifies a proactive stance and responsiveness of Malaysian HEIs towards the concept of micro-credentials. This recognition aligns with the Malaysian Qualifications Framework 2nd Edition, 2017, further solidifying its integration into the educational landscape.

As a result of its relatively untested nature, there have been limited studies on the implementation of micro-credentials in Malaysia. However, this lack of research presents an opportunity for scholars, as West et al. (2020) suggest, to delve into the broader implications and role of micro-credentials in various educational contexts. Within the context of Malaysia's HE sector, the integration of micro-credentials holds the potential to revolutionize the way students, professionals, and

institutions perceive and engage in lifelong learning (Alsobhi et al., 2023). However, the successful implementation of micro-credentials in the Malaysian HE landscape depends on various factors, with one of the most crucial being the readiness of HE leadership. Leaders of educational institutions play a pivotal role in shaping policies, curricula, and strategies that embrace innovative pedagogical approaches and accommodate the changing needs of the workforce (Law, 2022).

This study examines the challenges and readiness associated with the adoption and implementation of micro-credentials by HEI leadership in Malaysia. The authors aim to assess the readiness of HEI leadership to recognize and utilize micro-credentials as an effective mode of education and skill validation. They also seek to identify the potential barriers and enablers in integrating micro-credentials into the Malaysian HEI system, as well as hindsight opportunities and best practices. The concept of readiness in this study refers to the preparedness of HE leadership in Malaysia to embrace and implement micro-credentials. The authors analyze the current state of readiness by conducting a comprehensive analysis of the challenges, opportunities, and best practices related to micro-credentials. They draw on their background data, which includes an extensive literature review, interactions with local institutional leaders, and their own practical experience in various educational and training contexts.

The study incorporates insights from multiple references to provide a comprehensive understanding of the topic. Dyjur and Lindstrom (2017) discuss the use of digital badges for documenting professional learning development, which aligns with the concept of micro-credentials. Selvaratnam and Sankey (2021) focus on the implementation and practice of micro-credentials in Australasian higher education, providing insights into the socio-political context and changing employment trends. Kumar et al. (2022) explore the relationship between novice users' insights and identity in leveraging micro-credentials for emergency remote teaching in Malaysia. These references contribute to the understanding of challenges, opportunities, and operationalization of micro-credentials. Additionally, Selvaratnam and Sankey (2021) present an integrative literature review of the implementation of micro-credentials in higher education, offering a conceptual model for next steps in the conversation around micro-credentials. Bean et al. (2023) explore the challenges and opportunities arising from the evolution of alternative credentials, including micro-credentials, in education and employment contexts. These references provide insights into best practices and the broader context of micro-credentials in higher education.

In summary, this study explores both the challenges and readiness associated with the adoption and implementation of micro-credentials by HE leadership in Malaysia. It draws on a range of references to provide a comprehensive analysis of the current state of readiness, challenges, opportunities, and best practices. By examining the readiness of HE leadership in embracing micro-credentials, the study aims to contribute to the development of a more adaptable, inclusive, and learner-centric HE ecosystem in Malaysia. The authors' background data, sourced from an extensive literature review, interactions with local institutional leaders, and their own practical experience spanning almost fifteen years in distance learning, university outreach, cooperative extension, corporate training, and management serve as the foundation for the insights provided in this article.

1.1 Micro-credentials

The term 'micro-credential' lacks a global consensus and is often used interchangeably with other terms like online certificates, alternative credentials, nano-degrees, and micromasters (Brown et al., 2021). Similarly, digital badges, open badges, and virtual badges are frequently used alongside or in place of the term 'micro-credential' (Varadarajan et al., 2023). Another term, Alternative Digital Credentials (ADCs), has been used to define these credentials by recognizing that not all micro-credentials are digital (McGreal & Olcott Jr., 2022). Micro-credentials are also considered small-scale, short learning programs that provide specific knowledge, skills, and competencies to meet societal, personal, cultural, and labor market needs (Kušić et al., 2022). Meanwhile, according to the European Commission, micro-credentials serve as evidence of a learner's achievement of specific learning outcomes after completing a brief learning experience, assessed against transparent standards (Shanahan & Organ, 2022). The use of different terminologies leads to significant variations in the definition and understanding of micro-credentials globally. Nonetheless, there is a consensus regarding

two fundamental aspects: the learning experiences contributing to a credential and the credential itself, both commonly referred to as micro-credentials (Ahmed & Jassim, 2021).

Micro-credentials fulfill upskilling needs for career advancement and supply industries with adaptable, skilled workers (Varadarajan et al., 2023). The design specifications are tailored to industry needs so that specialized learning opportunities can be had for those seeking upskilling and reskilling (Ruddy & Ponte, 2019). This can significantly improve career prospects and enable learners to remain up to date with industry demands. Moreover, micro-credentials provide learners with digital badges or certifications upon completing each module, which hold recognized value in the job market. Ahmed and Jassim (2021) add that a digital badge is more than just an image. It is backed up with data, which contain information about the issuer, recipient, requirements, and proof of completion. The utilization of digital credentials reinforces learner motivation and recognition (Ahmat et al., 2021).

According to Shanahan and Organ (2021), courses that lead to micro-credentials exhibit variability in their design and delivery, including variations in length, workload, difficulty, and the quality of learning outcome descriptions and assessment practices. To ensure transparency and provide informative details about micro-credentials, it is essential to include a concise summary of critical information such as the title, learning outcomes, content description, assessment type, and quality assurance. This ensures that learners and employers are well-informed about the specific competencies communicated by micro-credentials. Abd Halim and Abd Rahim (2023) assert that the adoption of technological tools, exemplified by micro-credentials, which enjoys widespread utilization within the contemporary educational landscape, aligns exceptionally well with the exigencies of adult learners engaged in distance education. Such modalities afford increased flexibility in learning pursuits and facilitate cross-border interactions.

1.2 Challenges of Micro-credentials

Previous literature highlights several challenges related to the development and provision of micro-credentials to working adults, prospective undergraduate, and postgraduate students. The primary challenge revolves around the differing perceptions among various stakeholders, including students, educators, universities, micro-credential providers, and employers (MicroHE, 2019). From the perspective of students, micro-credentials are perceived as an attractive option to enhance their competence and skills. Educators, on the other hand, view micro-credentials as formal or informal qualifications that are highly focused, specific, and can be completed within a short timeframe. Employers see micro-credentials as equivalent to certificates obtained from attending professional development programs that foster lifelong learning. In essence, these divergent interpretations among stakeholders regarding the nature and value of micro-credentials pose a significant challenge in effectively developing and offering them as a viable and widely accepted option for skill enhancement and professional development.

Furthermore, the successful implementation of micro-credential programmes relies on the availability of skilled human resources, including academic officers and higher education leaders, to ensure effective planning and execution. However, a key challenge in micro-credentialing is managing the potentially large number of online students. As the micro-credential certification programs are conducted online, there is a possibility of attracting a substantial student population from around the world (Alias, 2020). Another critical aspect is ensuring that micro-credential modules are internationally recognized before scaling the program. The portability of credentials, represented by digital badges, is crucial for their global acceptance (MicroHE, 2019). Fears exist regarding potential competition between micro-credential certifications and traditional degrees, which may lead to a decline in recruitment for traditional degrees as employers increasingly value micro-credentials (Kasriel, 2018). This raises concerns about the future quality assurance of studies, regulated by the MQA and universities, which might need to be addressed in due course. In fact, many universities have developed individual guidelines or policies related to micro-credentials within their institutions. However, the lack of coordination among these guidelines may pose additional challenges that should be addressed to ensure coherence and consistency across the higher education sector.

Institutions' willingness to allocate suitable resources, particularly in terms of facilities and infrastructure, is crucial, especially when aiming to expand the reach of micro-credential certification to a broader market (Ralston, 2021). To develop effective teaching materials for micro-credentials,

instructors must utilize interactive videos as valuable learning aids, necessitating well-equipped studios with appropriate video production tools. Additionally, leveraging technology tools, including video production hardware and educational software, can significantly enhance the success of the course development stage. Furthermore, the smooth implementation of micro-credentials requires stakeholders, such as educators and students, to possess essential technological literacy. It is imperative to cultivate these skills to ensure seamless engagement with the micro-credential programs. Adequate readiness encompasses the presence of a skilled technical support team, offering assistance throughout the entire process, from course development to the maintenance of the online platform. Undoubtedly, achieving success in offering micro-credentials necessitates substantial investments to cover the costs involved in these comprehensive preparations. Hence, it is crucial for university top management and micro-credential providers to allocate adequate financial resources to facilitate the development of micro-credentials. Careful consideration should be given to the expenses associated with creating online platforms, obtaining subscriptions for third-party online platforms, and acquiring necessary technological tools. Moreover, addressing the challenge of internet connectivity is of paramount importance (Chung et al., 2020) as a reliable and robust internet connection forms the cornerstone for the successful implementation of micro-credential programs.

1.3 Readiness of Higher Education Institution Leaders

Additional information regarding readiness can be found in the literature. Wheelahan and Moodie (2021) analysed micro-credentials in higher education using a Bernsteinian analysis. They focused on the principle of recontextualization, which examines how notions of the person and human motivation reshape relations of classification and framing in the curriculum. This analysis provides insights into the readiness of educational institutions to incorporate micro-credentials and the implications for curriculum design and implementation. Selvaratnam and Sankey (2021) conducted an integrative literature review on the implementation of micro-credentials in higher education, with a focus on implications for practice in Australasia. This review summarizes the key findings from various studies and provides insights into the portability of credentials, software portability, and the ethical considerations of micro-credentials. It offers valuable information on the readiness of institutions to adopt and implement micro-credentials, particularly in the Australasian context. Kumar et al. (2022) explore the use of micro-credentials in leveraging emergency remote teaching in Malaysia. Their study examines the relationship between novice users' insights and identity in utilizing micro-credentials for teaching during the COVID-19 pandemic. This research sheds light on the readiness of educators to embrace micro-credentials as a means of adapting to remote teaching and learning, highlighting the importance of technological literacy and the support needed for successful implementation. These additional references provide further insights into the readiness of institutions and stakeholders to adopt and implement micro-credentials. They address aspects such as curriculum design, implications for practice, software portability, ethical considerations, and the role of technology in supporting micro-credential programs. By considering these factors, institutions can better prepare themselves for the successful integration of micro-credentials into their educational systems.

2. Method

In this study, our primary objective was to gain a comprehensive understanding of university leadership experiences by conducting a thorough exploration of individuals' personal experiences, rather than seeking to confirm or reject preconceived hypotheses. As such, we opted for a qualitative research method, as it was deemed more suitable for our investigative approach, aligning with the perspective put forth by Taylor et al. (2015). The present study is a case study where university leaders were interviewed to collect data. By employing qualitative methods, the authors aimed to access the subjective knowledge of the participants regarding their personal leadership experiences and expertise in the context of micro-credentials. More detailed information was gathered via semi-structured interviews (Brown & Danaher, 2019). Creswell and Poth (2018) suggested that the appropriate minimum informants for a qualitative study were between three to seven people depending on the saturation of the data occurring during future studies. Yin’s (2018) opinion presented that two to ten

samples were sufficient to reach saturation. For the present study, the five interviewees showed signs of saturation when the same themes were repeated with subsequent interviewees.

Individual in-depth interviews were used to acquire the data. Pilot interviews with two participants other than the main participants were conducted before the start of the study interviews. Based on the results of these pilot interviews, the interview procedure and questions were modified. Initially, phone calls were made to those selected using the snowball sampling technique; those who satisfied the inclusion criteria were informed of the study's goal and methodology, and time slots for online interviews were scheduled.

The research involved five informants from selected four zones located in Peninsular Malaysia: Northern zone, East Coast zone, Central zone, and Southern zone, which are known to house the highest number of public universities in the country. The study adopted semi-structured interviews as its primary method for data collection and employed a thematic approach for analysis. Purposeful sampling methods were utilized to identify suitable participants. Four public universities were chosen to serve as the study area, where interviews were conducted on-site. The five informants comprised academic officers of these universities. The selection criteria included holding leadership positions within the academic domain, such as dean, deputy dean, head of department, and program coordinator (refer to Table 1 for details). All informants agreed to participate in the interview sessions. Each of the informants possesses a collective experience of 30 years in holding leadership positions within their respective universities.

The interview questions focused on topics related to the participants' comprehension of micro-credentials, the role of leaders in managing institutional affairs, including planning and administration, and an exploration of the challenges faced by university leaders. The interviews were conducted by both the principal investigator and a research assistant, creating a comfortable environment for the respondents to freely share their opinions and engage in candid discussions.

Table 1. Research participants from five (5) selected university leaders.

Designation	Zone	Years of Experiences in Academias	Years of Experiences as HEI Leaders
Dean	East Coast	20 yrs	14 yrs
Deputy Dean	North	15 yrs	11 yrs
Head of Department	South	12 yrs	8 yrs
Program Coordinator	Central	7 yrs	4 yrs
Program Coordinator	North	6 yrs	3 yrs

The researchers employed a comprehensive approach to data collection, which involved compiling, integrating, and synthesizing field notes, debriefing notes, and verbatim transcriptions of five in-depth one-to-one interviews. These interviews were conducted through an online platform, enabling an in-depth exploration of the challenges related to micro-credentials in the university context. To ensure a well-rounded perspective, respondents from diverse fields of expertise and backgrounds were selected for the interviews.

Each interview session lasted between 45 to 60 minutes, providing ample time for participants to share their insights and experiences. The researchers performed a thematic analysis of the qualitative questions and subsequently compiled, analyzed, and established connections between the emerging themes. The combination of multiple interviews contributed to the trustworthiness and robustness of the findings, as it offered a diverse range of views and perspectives on the subject matter (Green & Thorogood, 2018). Furthermore, to ensure accuracy and reliability, the researchers presented a summary of the identified themes to the respondents, giving them the opportunity to provide feedback and validate the results. This method of triangulation further strengthened the credibility and comprehensiveness of the study.

3. Results and Discussion

The data analysis led to the development of five major themes. This study found that most leaders were optimistic about the potential of micro-credentials in higher institutions. However, they faced

challenges in implementing micro-credentials in their respective universities effectively. The five (5) themes included "*application of micro-credentials", "human resources", "facilities and infrastructures", "accreditation", and "accountability",* which is shown in Table 2.

Table 2. Themes and sub-themes of interview protocol

No	Themes	Sub-themes
1.	Application of Micro-credentials	- General definition - Micro-credentials offered in institutions
2.	Human Resources	- Support systems - Lecturer's competency
3.	Facility & Infrastructures	- Internet connectivity - Funds
4.	Accreditation	- National accreditation - Global accreditation
5.	Accountability	- Personal influence - Leaders's aspiration

3.1. Application of Micro-credentials

Malaysia has been identified as one of the countries that provide short micro-qualification courses. These courses are often offered through micro-credential programs, particularly within HEIs. Hence, all the informants have considerable understanding of the concept about micro-credentials. Informant A stated that:

> *"...micro-credentials as short courses covering general subjects, designed to provide additional value to the public, regardless of their previous qualifications..."*

Informant B added that:

> "*...micro-credential regarded as a digital badge that focuses on specific skills, knowledge or competencies…"*

Moreover, micro-credentials are seen as being closely related to educational technology. Their implementation gained momentum following the outbreak of the Covid-19 pandemic in 2020. Educational institutions widely adopted the use of Massive Open Online Course (MOOC) and OpenLearning platforms as part of their micro-credential offerings. As stated by Informant E:

> *"...micro-credentials gaining popularity due to Covid-19 and the application of educational technology in the universities make us believe micro-credentials have a huge potential to be developed..."*

The informants revealed that most faculties within their institutions provided micro-credential subjects. These micro-credentials were typically complementary to the macro-credentials, As Informant D stated:

> "*…students who completed short courses could transfer the credit hours earned to shorten the duration of their macro-credentials programs..."*

Informant C further stated:

> *"...short courses for non-macro-credential learners that can be converted into credit hours once they enroll as full-time students…"*

In summary, the definition of micro-credentials is well-known among educators and university leaders. However, the application of micro-credentials is limited as a means to expedite the pursuit of macro-credentials in Higher Education Institutions only.

3.2. Human Resources

In the realm of micro-credentials program development, a typical responsibility falls under the purview of a University Learning Center, with Lecturers serving as subject matter experts. Within the University Learning Center, specific job roles, such as Instructional Designers and Content Designers, are tasked with creating and structuring micro-credentials. However, it has been noted that these centers are facing a staffing shortage due to the demanding nature of developing micro-credential courses for all faculties across the university.

Moreover, the lecturers, who possess expertise in their respective subjects, are assigned to develop micro-credential courses as content developers. However, this added burden has resulted in their becoming overburdened, ultimately leading to a decline in the quality of the micro-credential courses. Informant B suggested a solution;

> *"...The issue of lecturers facing overwhelming pressures due to demanding tasks to achieve Key Performance Index (KPI) can be effectively tackled by creating additional job opportunities for a support system consisting of proficient Instructional Designers and Content Designers who possess in-depth knowledge of the subject matter. These specialized professionals can alleviate the burden on lecturers and enhance the overall quality of the educational content provided in the micro-credentials courses..."*

Informant D emphasized on the importance of support group specialized in micro-credentials as stated that:

> *"...Instructional Designer and Content Designer able to elevate the quality of micro-credentials courses and increase the marketability of the courses…"*

Upon questioning all the informants regarding the technological proficiency of the lecturers, a unanimous consensus emerged, indicating a moderate level of competency among the lecturers. This observation can be attributed to a couple of factors. Firstly, some of the lecturers, particularly the younger generation, exhibit a higher level of technological savviness, swiftly navigating across various platforms and applications. On the other hand, the older generation of lecturers experience either adoption inertia or resistance and consequently, may be less adaptive in their pedagogy. As stated by Informant A:

> *"...the pace of technological transformation is so fast that if we do not embrace the changes, we will eventually lose the race and be left outdated..."*

In summary, human resources play crucial roles in micro-credentials program development. The university leaders should facilitate lecturers by streamlining a proficient support system and planning their technological acquisition and competencies with effective training and workshops.

3.3. Facilities and Infrastructures

The success of a high-quality micro-credentials program significantly depends on the availability of proper facilities and infrastructure, including IT support teams, future-ready classrooms or laboratories, stable e-platforms, and reliable internet connectivity. Consequently, it is crucial for each educational institution to secure and mobilize these essential resources to ensure the program's sustainability.

According to the responses from all informants, their respective universities have managed to provide the fundamental infrastructural requirements. Notably, Informant A highlighted the utmost

importance of internet connectivity, stating that it serves as a primary medium of instruction. Informant A added that:

> *"...the availability of robust internet connectivity is vital for the credibility and success of the micro-credentials program, both locally and on a global scale. Without adequate access to the internet, the program's efficacy may be compromised..."*

Informant E stated proper facilities and infrastructures are fundamental aspects of the success of execution of micro-credentials. Informant E stated that:

> *"...stable e-platform and easily accessible materials able to attract international markets and put our courses on par with reputable micro-credentials providers…"*

Enhancing our facilities and infrastructure enables us to capture a significant market share, particularly in rural areas. This assertion is substantiated by research conducted by Kumar (2022), which highlights a growing preference for micro-credentials, particularly in remote regions of Malaysia. Micro-credentials aid lifelong learning for time-constrained professionals, yet limited funding hinders the programs' sustainability. Nevertheless, it is imperative to recognize the current reality that micro-credentials and online learning have become the new norm in education. Embracing these approaches can play a pivotal role in ensuring the country's sustainability by nurturing a competitive and relevant workforce.

3.4. Accreditation

According to the feedback received from the informants, their respective micro-credential programs have not yet been fully established, resulting in a lack of recognition at both local and global levels. However, Informant D and Informant E shared an exception, mentioning that their micro-credentials program was recognized by the MQA. As stated by Informant D:

> *"…our micro-credentials programs were recognized by MQA. And we already follow the benchmark and we also have a manual book that was endorsed by MQA…"*

Informant E stated that:

> *"...my university consistently adopts a proactive stance aimed at achieving accreditation from the Malaysian Qualifications Agency (MQA) to guarantee the continual delivery of high-quality educational programs..."*

To enhance the global reputation of their micro-credentials program, all informants unanimously agreed that improving the program's quality is essential. They believe that benchmarking with renowned global universities that offer well-received and established micro-credential programs would be a valuable starting point. One successful model they referred to is provided by Universiti Sains Malaysia (USM), where they have effectively attracted both local and international students to enroll in their online lifelong learning programs, particularly in fields such as nursing (Alias, 2020). According to Korkut (2006), accreditation and credentialing processes play a pivotal role in elevating the progress and improvement of educational programs. These processes involve rigorous evaluations and assessments conducted by accrediting bodies to ensure that they meet predefined standards and criteria.

3.5. Accountability

Based on the findings, it was evident that the success of micro-credential programs in the university depends on resolutions made by the upper top management. As stated by Informant B:

"…*We have to follow top management decisions, as they are providing direction and vision of the institution. At best at our level, the faculty can hold training or workshops to increase awareness. As motivation, incentives should be given in the form of funding such as grants for the long term..."*

Informant C similarly agreed with Informant B by providing a statement that financial incentives are essential to drive progress. Conversely, Informant A placed a greater focus on the intrinsic qualities stated that:

"...Motivation among lecturers is not solely based on monetary gain. However, they can be provided through human recognition, awards, substantial funding and acknowledgement..."

Informant D provided a similar statement stating that human beings put more emphasis on intrinsic values in order to enhance extra motivation to go the extra mile.

In conclusion, the findings presented here will effectively address all the research objectives that will be further discussed in subsequent topics. The results highlight Malaysia's endeavors in offering micro-qualifying short courses, which have the potential to capture the attention of the global community. As a result, it is imperative for all stakeholders, particularly top leaders and academicians in universities, to be prepared to embrace this new era of learning methods and actively contribute to fueling the lifelong learning agenda within the country.

4. Conclusion

The results of this research indicate that university leaders encounter distinct and multifaceted obstacles while implementing micro-credentials within their respective institutions. The study revealed that these challenges stem from the limited adoption of micro-credentials, the considerable demand and commitment required to develop such programs, insufficient financial resources and infrastructure, the pursuit of global accreditation, and a lack of strong support and determination from top management to effectively implement micro-credentials.

This study suggests that university leaders should reconsider the application of micro-credentials beyond being mere supplements to macro-credentials. Instead, they should explore the broader aspects and value of micro-credentials as certificates for reskilling and upskilling, which holds significant market potential. To facilitate this process, university leaders should prioritize the development of human capital, particularly in areas related to content design, instructional design, and instructor competence. Achieving this may involve comprehensive recruitment strategies for skilled designers and instructors, as well as in-house training programs to enhance their expertise. Moreover, improving infrastructure, particularly internet connectivity, is of utmost importance. A reliable internet connection serves as the bedrock for successful micro-credential implementation. Developing teaching materials for micro-credentials often involves the use of interactive videos as effective learning aids, necessitating well-equipped studios with suitable video production equipment. Furthermore, integrating technological tools such as video production hardware and educational software can catalyze subsequent stages of course development.

To ensure the successful adoption of micro-credentials, the highest level of university management and micro-credential providers must demonstrate a clear vision and unwavering commitment that can contribute to the successful integration of micro-credentials within the university landscape. Allocating sufficient funding to support the development of micro-credentials is paramount. This encompasses considerations for the costs associated with online platform development, subscriptions for third-party online platforms, and the acquisition of appropriate technological tools (Ahmat, et. al, 2021). By embracing these recommendations, university leaders can strategically position their institutions to capitalize on the potential of micro-credentials, effectively catering to the reskilling and upskilling needs of learners and unlocking new opportunities in the ever-evolving education landscape.

5. Co-Author Contribution

The authors affirmed that there is no conflict of interest in this article. AAMR and AIS carried out the fieldwork, prepared the literature review and overlooked the writeup of the whole article. MAS wrote the research methodology and did the data analysis. NAZ carried out the qualitative analysis and interpretation of the results.

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