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Research Paper

Future-proofing Malaysian graduates: Industry insights on micro-credentials and AI

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Abstract

The evolving demands of Malaysian industries for highly skilled graduates have intensified competition and a growing skills mismatch as academic institutions struggle to meet workforce needs. Recent data from the Department of Statistics Malaysia (DOSM) revealed that graduates rose by 5.1% in 2022, while the unemployment rate was 3.7%. This qualitative study examines the complementary value of micro-credentials and AI skill sets alongside traditional degrees in the hiring process. Insights were collected from nine senior executives, including a former Prime Minister, to provide policymakers with a comprehensive understanding of the graduate landscape in Malaysia. These leaders, from key industries essential to Malaysia's economy—including technology, manufacturing, recruitment, education, politics, government, construction, and engineering—are situated within the Klang Valley. Spence's (1973) Signaling Theory, Tomlinson's (2017) Graduate Capital Model, and Pham's (2021) Employability Agency Framework were utilised as conceptual frameworks to address diverse employability factors. Interviews reveal that respondents value traditional degrees for a broad foundation but strongly prefer micro-credentials, as they provide precise, job-specific skills. Industry leaders noted increased demand for AI-related skills, highlighting a shift toward practical competencies. Findings suggest that educational institutions and policymakers should prioritise strategies that align more closely with industry needs to future-proof graduates in Malaysia.

Keywords: Industry alignment, Practical skills, Micro-credentials, Graduates, Malaysia, AI.

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Introduction

The rising interest in micro-credentials reflects a shift towards more flexible, industry-relevant learning pathways for students and professionals. Varadarajan et al. (2023) emphasise this movement from traditional degree programs towards practical, skill-based models that address the evolving needs of the workforce. Micro-credentials are defined as focused learning experiences certifying mastery of specific skills, supporting targeted upskilling and reskilling, and effectively bridging the gap between formal education and contemporary employment demands (Gauthier, 2020). Additionally, as Nazri et al. (2022) highlight, the increasing significance of AI across industries further underscores the importance of higher education institutions adopting AI technologies to enhance scalability and prepare graduates for high-skilled roles in an AI-driven job market.

Ahmat et al. (2021) note regional differences in micro-credential perception. Western perspectives typically view them as a flexible complement to traditional degrees focused on practical, skill-oriented learning. In higher education, the emphasis is often on formal institutional endorsement and the established recognition of qualifications, positioning traditional degrees as benchmarks of academic quality and rigour. Conversely, micro-credentials are frequently viewed as potentially undermining this standard, as they often come with digital badges rather than formal qualifications (Mac Lochlainn et al., 2020). However, McGreal and Olcott (2022) argued that, unlike traditional degrees, micro-credentials offer highly specialised skill development aligned with current industry needs, as leading organisations frequently develop them to address immediate market demands.

In Malaysia, the education system has traditionally prioritised memorisation and academic achievement over practical skills development (Bernama, 2023). Nadarajah (2021) points out that this focus on theoretical knowledge over practical application presents challenges in adopting industry-driven education models. This traditional emphasis may contribute to a skills gap, potentially leaving graduates needing more preparation to meet employer expectations in an increasingly skill-based (Varadarajan et al., 2023) and AI-focused workforce (Nazri et al., 2022).

This study fills a significant gap in the existing literature by examining how hiring leaders in the industry evaluate the value of micro-credentials relative to traditional qualifications, especially amidst AI-driven shifts in workforce requirements. The hypothesis posits that micro-credentials provide targeted, job-specific skills essential in the current AI-focused environment. Unlike most research in Malaysia, which centres on higher education perspectives (Ahmat et al., 2021; Navanitha et al., 2022; Rami et al., 2023), this article offers an industry-focused analysis, providing unique insights into how micro-credentials align with employers' practical, evolving needs.

This study builds on the research of Varadarajan et al. (2023), which highlights the value of micro-credentials for various stakeholders in Malaysia, and Nazri et al. (2022), who discuss the relevance of AI competencies in Malaysian industries. Focused on Malaysia as a pivotal Southeast Asian market, this study emphasises the demand for specific skills and adaptability in graduate employability. It provides educators and policymakers with insights to refine educational programs in alignment with shifting

industry needs. Additionally, it clarifies for graduates the priority skills and credentials to strategically meet market expectations.

Literature Review

Evolving Strategies for Graduate Employability in Malaysia's Higher Education System

Malaysia's higher education reform efforts are anchored in the Malaysia Education Blueprint for Higher Education 2013-2025, which introduced key strategies to enhance graduate employability. The Blueprint prioritised reforms such as establishing a coordinated governance structure, streamlining qualifications, and rebranding technical and vocational education and training (TVET) to meet industry demands better (Hashim and Hamidon, 2022). Complementing these reforms, the Malaysian Science and Technology Information Centre (MASTIC) launched the MySTIE-10-10 initiative, aimed at further bridging education and industry by equipping graduates with essential 21st-century skills—critical thinking, problem-solving, teamwork, and technological adaptability—to navigate the evolving job market (MASTIC, 2023). Despite these efforts, research reveals that a persistent mismatch between graduate skills and market needs remains a substantial obstacle to employability in Malaysia (Aman, 2020; Mohamad et al., 2023; Rahman and Lie, 2015).

Amid Malaysia's drive towards high-income status, aligning educational qualifications with labour market needs is increasingly critical. The issue of youth unemployment, particularly among graduates, persists as a significant concern, with graduate unemployment rates reflecting this challenge. As noted by Nesaratnam et al. (2018), the country faces a significant skills gap in key economic sectors, with recent statistics indicating that 187,000 graduates remain jobless, underscoring the pressing nature of the issue (New Straits Times, 2023). In 2022 alone, Malaysia recorded 5.92 million graduates, with a 3.7% unemployment rate among them, as reported by the Department of Statistics Malaysia (DOSM) (Malay Mail, 2023). These figures emphasise the urgency for reform within Malaysia's higher education system, aligning it more closely with industry needs.

Although the Malaysia Education Blueprint 2015-2025 and similar initiatives strive to improve educational outcomes and employment prospects, the persistence of graduate "unemployability" underscores the need for a more nuanced understanding of employer expectations. Research by Cheong et al. (2015) shows that skills mismatches significantly impact employability, with employers expressing concerns over graduates' readiness for the labour market.

Examining employers' perspectives on emerging micro-credentials and the growing importance of AI skills in meeting the shifting expectations of the Malaysian job market can inform the optimisation of educational pathways. Such insights are essential for enhancing graduate employability and aligning educational outcomes more effectively with industry demands.

Addressing Industry Needs through Flexible, Competency-Based Education

Micro-credentials represent a shift toward flexible, competency-based education, addressing specific, immediate industry needs (McGreal et al., 2022). Unlike traditional degrees, micro-credentials are shorter, highly specialised, and offered by various providers, including online platforms, universities, and professional organisations (McGreal and Olcott, 2022). These credentials enable rapid skills acquisition, providing learners with a competitive advantage in fast-evolving fields.

In today's competitive job market, employers are increasingly seeking candidates with academic qualifications, practical experience, and industry-recognised credentials (Gault et al., 2018). Certiport, A Pearson Vue Business' (2024) The Value of Certification indicates that holding relevant certifications significantly enhances employability and earning potential, with certified IT professionals earning an average of 7% more than their non-certified peers. Moreover, 91% of hiring managers consider certification an essential factor in hiring decisions, highlighting its critical role in distinguishing candidates in a competitive job market.

Schroeder (2020) underscores the potential of micro-learning, with studies showing that micro-credential programs can be up to 20% more efficient and drive up to 50% higher engagement than traditional learning methods. The micro-credential courses' focused, concise structure allows learners to assimilate and apply their knowledge effectively, enhancing career progression.

Despite their rising popularity, concerns persist regarding their recognition and consistent value within the global job market, particularly in regions like Southeast Asia, where traditional degrees are more widely recognised (Varadarajan et al., 2023). Globally, micro-credentials are often seen as a practical way to enhance employability by aligning education with specific competencies employers value. However, a lack of standardised frameworks to ensure quality and consistency remains a challenge, which affects the global acceptance of these credentials (McGreal et al., 2022; Varadarajan et al., 2023).

In Malaysia, a pivotal step towards legitimising micro-credentials came in 2019 when the Malaysian Qualifications Agency (MQA) formally recognised them. This recognition has opened avenues to study micro-credential acceptance and its potential impact on Malaysia's degree-focused culture (Kumar et al., 2022). In particular, the Accreditation of Prior Experiential Learning (APEL), administered by the MQA, offers Malaysians an alternative pathway to obtain academic recognition for professional knowledge and skills acquired through work and other experiences. APEL allows individuals to turn practical skills into formal micro-credentials, aligning with industry demands and expanding opportunities for those outside traditional education paths.

The Evolving Relevance of Traditional Degrees in the Age of Technological Transformation

Traditional degrees have long been regarded as the benchmark for educational attainment, providing structured learning, depth, and a holistic approach to personal and intellectual development (McGreal et al., 2022). A broad academic background in tertiary education is advantageous for roles that require comprehensive understanding

and diverse problem-solving approaches (Capogrossi, 2002). It emphasises critical thinking, research capabilities, and a theoretical foundation across various disciplines, contributing to graduates' adaptability and long-term career growth.

As technology and global market demands evolve, the relevance and adaptability of traditional degrees have come under scrutiny (Kato et al., 2020). Degree programs need to be updated more rapidly to align with contemporary industry requirements, thereby enabling graduates to gain an advantage in fields that demand current technical knowledge. Tight (2023) suggests that educational systems may need to incorporate foundational knowledge and specialised, in-demand skills to better prepare graduates for the modern workforce.

In today's rapidly evolving job market, the emphasis is shifting from choosing between humans or AI to focusing on humans empowered by AI. Graduates prioritising continuous learning and technological adaptability will be best positioned to succeed in a competitive, AI-integrated landscape (Harvard Business Review, 2023). While traditional degrees remain valuable for their foundational breadth, a changing workforce requires a blend of theoretical knowledge and adaptable, specialised skills. Without this evolution, degrees risk becoming less relevant, particularly in fields where AI and digital competencies reshape job functions.

Strategic Investments in AI Skills Development in Malaysia

Malaysia has undertaken substantial investments to drive digital transformation and cultivate AI expertise nationwide, which aligns with its vision to become a major AI hub in Southeast Asia. According to Bernama (2024), the Malaysian Budget 2025 includes a government allocation of RM10 million to the National AI Office (NAIO) under the MyDigital initiative and an additional RM50 million dedicated to AI education. This funding supplements the RM20 million allocated the previous year to establish the country's first Faculty of AI at the University of Technology Malaysia (UTM). Recently, Malaysia secured large-scale partnerships and funding from global tech giants, including Microsoft's commitment to inject US$2.2 billion into the country's AI capabilities (Microsoft Source, 2024). These investments target data management, cloud computing, and cybersecurity, which are crucial for developing a digital economy (MIDA, 2023). As part of its broader digital transformation blueprint, Malaysia aims to prepare a workforce that can compete internationally by equipping its citizens with future-ready skills in AI and digital technology (MyDigital, 2023).

Implementing these policies is vital in driving significant changes in the educational landscape, fostering a curriculum that integrates digital literacy and AI competencies, and directly shaping the skills and qualifications expected by various industries.

These developments offer promising pathways for Malaysians to build AI-related competencies in high-demand areas, such as machine learning, natural language processing, and data analytics, which are increasingly becoming essential in industries globally (Marsan, 2021). Recent reports indicate that 89% of Malaysian employees must upskill to operate efficiently within a digital framework, underscoring the importance of targeted educational opportunities that align with labour market needs (Randstad Malaysia, 2019).

However, a gap remains between the technical requirements of the job market and the pathways available for gaining AI competencies, raising questions about whether micro-credentials can effectively bridge this divide. Although micro-credentials offer a quicker and more specialised approach, it remains unclear how well they align with employer expectations compared to traditional degrees (McGreal et al., 2022; Varadarajan et al., 2023).

By aligning global trends with local needs, it provides a foundation for future-proofing Malaysian graduates and supporting the country's role as a key player in Southeast Asia's educational and economic spheres (Sehgal and Nasim, 2017).

A Multi-Theoretical Approach Using Signaling, Capital, and Agency Frameworks

This study uses Tomlinson's (2017) Employability Agency Framework and Pham's (2021) Graduate Capital Model to understand graduate employability in Malaysian industries thoroughly. Tomlinson's paradigm highlights individual agency, viewing employability as a proactive process influenced by graduates' capacity to adapt and effectively navigate a dynamic labour market. This strategy is particularly pertinent in Malaysia, where graduates encounter a swiftly evolving economy that necessitates flexibility and adaptability.

Pham's Graduate Capital Model broadens employability analysis by delineating essential categories of capital, such as human, social, cultural, identity, and psychological, that graduates utilise to augment their marketability. In Malaysia's diverse and competitive employment landscape, various forms of capital are essential, encompassing technical competencies and the interpersonal and adaptable abilities employers prioritise. Collectively, these frameworks underscore how Malaysian graduates can leverage various qualities to fulfil industrial demands, accentuating the importance of resilience, cultural flexibility, and robust networking.

In addition, Signaling Theory (Spence, 1973) complements this approach by explaining how educational qualifications, such as degrees and micro-credentials, signal employers regarding candidates' potential productivity and competencies. In the context of this study, signalling theory enhances our understanding of how traditional qualifications and new micro-credentials can function as indicators of graduates' readiness for the workforce, especially in high-demand skill areas like AI.

Traditional degrees have long been recognised for their role in signalling academic achievement and job readiness. Spence's (1973) Signaling Theory offers a crucial framework for understanding the rising recognition of micro-credentials as valuable indicators of specific competencies. In the Malaysian labour market, where traditional degrees predominantly prevail, micro-credentials emphasise specialised skills and niche expertise, enhancing a graduate's profile. As micro-credentials gain acceptance, their significance as indicators of immediate job readiness, particularly in fields like AI and technology, become increasingly relevant. This study investigates employer perceptions of these signals amidst scepticism, highlighting that micro-credentials can provide clarity and assurance in evaluating a candidate's current skills. This approach emphasises the importance of dynamic signalling in a market that appreciates traditional and contemporary educational achievements.

The amalgamation of these frameworks offers a comprehensive understanding of employability by incorporating individual agency, diverse capital, and the signalling value of educational credentials. This multi-faceted approach enables the study to address the wide range of factors influencing employability, rendering it particularly pertinent for examining the distinctive requirements of the Malaysian employment market. This method provides policymakers and educational institutions with essential insights on enhancing curricula and career assistance strategies to equip graduates for Malaysia's changing sectors better.

Methodology

This study uses purposeful sampling to gather perspectives on graduate employability from a diverse group of Malaysian employers, particularly focusing on micro-credentials, AI skills, and traditional degrees. The sample includes nine senior executives and a former Malaysian Prime Minister, representing key industries in Malaysia's economy, such as technology, manufacturing, recruitment, education, politics, government, construction, and engineering (see Table 1). These participants were primarily based in Klang Valley, which is known for its concentration of industry elites. They were selected for their direct involvement in hiring and their deep understanding of both traditional and emerging qualifications, facilitated by the primary author's professional network and career experience dealing with stakeholders in the field of education. Engaging industry leaders highlights the direct relevance of insights to current industry needs, which informed the decision to exclude graduates and higher education professionals from maintaining a stronger focus.

Semi-structured interviews were administered to each participant from October 2023 to September 2024. Each session, with a duration of 30 to 60 minutes, was conducted either in person or through video conferencing. This method allowed for flexible follow-up questions tailored to gather industry-specific insights on the role of micro-credentials, AI skills, and traditional degrees in hiring. The flexible format also fostered rapport, facilitating an in-depth exploration of each participant's experiences.

Table 1: Demographic data of the participants

Variable	Sub-groups	*n*
Gender	Male	7
	Female	3
Nationality	Malaysian	10
	Non-Malaysian	0
Age groups	35 - 50	6
	51 - 65	3
	> 65	1
Years of working experience	10 - 20	2
	20 - 30	5
	> 30	3

Variable	Sub-groups	*n*
Job position	Manager/General Manager	3
	Director/Senior Vice President	3
	CEO/Managing Director	3
	Former premier or political figure	1
Working status	Working	8
	Retired or Semi-Retired	2
Types of industry	Technology	3
	Manufacturing	1
	Recruitment	1
	Education	2
	Politics	1
	Government	1
	Construction and Engineering	1
Organisation size	1 - 50	1
(Number of employees)	51 - 100	2
	101 - 200	4
	> 200	3

All interviews were audio-recorded, transcribed, and anonymised to ensure confidentiality. Descriptive titles or role-based identifiers, such as 'Senior Vice President' or 'former Prime Minister,' were used to maintain anonymity while preserving the context of their insights. The study received ethical approval from Universiti Malaya's Research Ethics Committee (UMREC) with reference number UM.TNC2/UMREC_2869 and informed consent was obtained from all participants, including assurances about confidentiality and their right to withdraw at any time. Data storage and handling complied with strict security protocols, using password-protected files and with access limited to authorised research personnel. Furthermore, special care and additional ethical safeguards were implemented to protect the identities and privacy of high-profile participants, ensuring the integrity of the study. After preliminary conversations to build rapport, the interviews centred on questions such as: "How do micro-credentials compare to traditional degrees in job readiness?" and "What impact do AI competencies have on hiring in your industry?" This approach was designed to capture nuanced insights into how employers evaluate educational qualifications in the Malaysian job market.

As Creswell (2012) explained, Thematic Analysis was adopted to accommodate a structured yet adaptable framework for identifying and interpreting patterns within qualitative data. Inductively, it allows themes to emerge directly from participants' responses. At the same time, deductively, it aligns these themes with the study's theoretical constructs to examine the diverse perspectives of Malaysian industry leaders on the value of micro-credentials and AI skills in hiring. By grounding the analysis in

participants' insights, Thematic Analysis facilitates a nuanced understanding that captures explicit and nuanced themes within the data.

Through this method, the study effectively categorises complex, multifaceted viewpoints, extracting actionable insights with direct relevance for policymakers and educational institutions seeking to align educational curricula with contemporary industry demands. The thematic coding process was organised into a hierarchy of Themes, Sub-themes, and Details to present the findings systematically, providing a clear and accessible framework. The results section delineates several key themes, including perceptions of micro-credentials, attitudes toward traditional degrees, and the integration of AI competencies within current industry trends.

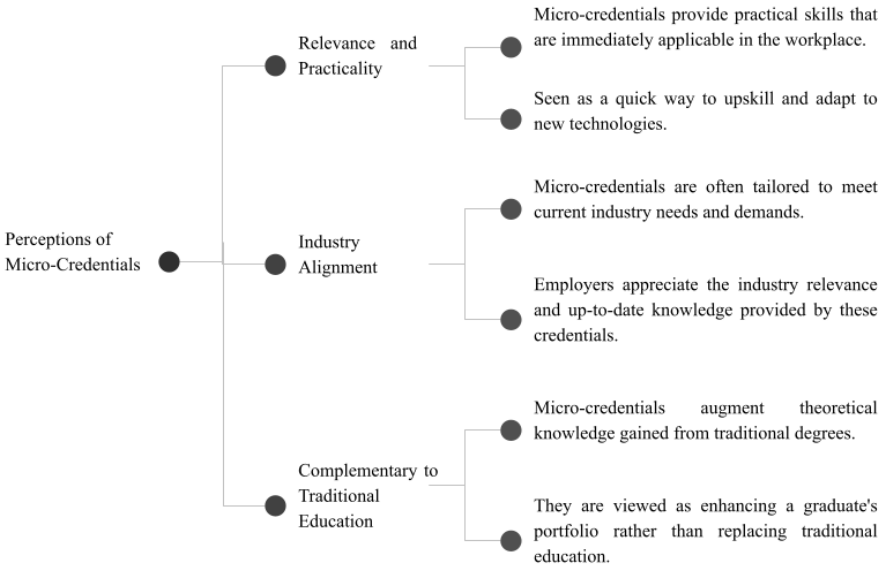
Results

All the excerpts in this section predominantly illustrate the application of Spence's (1973) Signalling Theory, Tomlinson's (2017) Graduate Capital Model, and Pham's (2021) theories, which will be further elaborated upon in the following discussions. This alignment highlights how these theories ensure that graduates are perceived as reliable and capable contributors to achieving organisational goals in an environment characterised by continuous change and technological advancement.

Theme 1: Perceptions of Micro-Credentials

Micro-credentials enhance a graduate's portfolio by providing specialised and current knowledge, offering employers direct relevance to contemporary industry demands and effectively complementing traditional educational pathways (see Figure 1).

Figure 1: Perceptions of micro-credentials



An interviewee with over 20 years of education experience who held a senior management role in a leading training institution in Malaysia emphasises the necessity for graduates to possess more than just academic qualifications. He stated,

> *When it comes to hiring graduates, there are thousands in the market. I assess them based on the value they can bring. Exam results or qualifications may reflect IQ but don't reveal social skills or emotional intelligence. Yes, they may have strong academic records, but they often lack the management skills that would benefit them. In my experience, they need more than just a degree; they need micro-credentials. This is something I've observed firsthand. In my talks, I always encourage graduates to invest in professional certifications, which show their competence in their field.*

Furthermore, he pointed out,

> *Many graduates feel fully prepared to enter the workforce upon completing their studies. However, every company has unique processes that universities do not typically cover, including workplace culture. Graduates often need mentoring to bridge this gap. When they possess tertiary qualifications, recognised credentials, and receive mentorship, they become well-rounded assets to any industry."*

He concluded by sharing insights into hiring criteria for project managers, stating,

> *When hiring a project manager, it is crucial for the candidate to have project management skills obtained through both a university education and an accredited industry credential. If a candidate meets these criteria, they can command a higher salary. Why? Because I won't need to train them in the basics, only provide mentorship. They already know how to handle tasks, which simplifies my role and eliminates the need for micromanagement. As a hiring manager, I prefer not to micromanage. I am inclined to offer a higher salary to candidates with an industry-recognised credential, such as a PMP certification when hiring project managers.*

This supports the findings of Nesaratnam et al. (2018), which indicate that integrating micro-credentials with traditional degrees may help address skill shortages by equipping individuals with targeted, industry-relevant competencies. A senior executive in the education sector further emphasised,

> *In evaluating graduates, I am seeking qualifications that extend beyond a traditional degree, especially given the large pool of similarly educated candidates. Professional certifications give candidates a competitive edge and align them with current industry standards, while traditional academic programs often lag behind, sometimes by a decade. This gap between academia and industry needs highlights the value of updated, industry-recognised credentials.*

A senior executive in the technology industry offered insights that align with the sub-theme "Complementary to Traditional Qualifications," illustrating how the combined value of traditional degrees, micro-credentials, and relevant work experience

significantly enhances a candidate's employability and appeal to prospective employers,

> *For me, it's about more than just one factor. For example, I give more weight to a graduate with a strong CGPA compared to someone with a lower score, but this is just one aspect. Other significant factors include leadership qualifications, extracurricular involvement, or even if the person comes from a challenging background, like having to help their parents manage a stall while still scoring relatively well on exams. As for certifications, they also play a key role. If someone has completed specific training and demonstrated the skills required to earn a certification, it doesn't just add a single point in their favour; it gives them a solid head start.*

Many employers also value the targeted skills and competencies that micro-credentials can offer, especially for more specialised or technical roles (Gauthier, 2020). As noted by a Creative Director in the technology industry,

> *Over my 20 years of hiring talented individuals, I've noticed that the Adobe Certified Professional credential consistently indicates someone has practical skills.*

In technical or specialised areas such as information technology, engineering, or data analysis, employers often prioritise candidates with industry-relevant micro-credentials or professional certifications to validate their skills and proficiencies (Ralston, 2020). Complementing this perspective, the interviewee with over 30 years of governmental experience in the Ministry of Education Malaysia remarked,

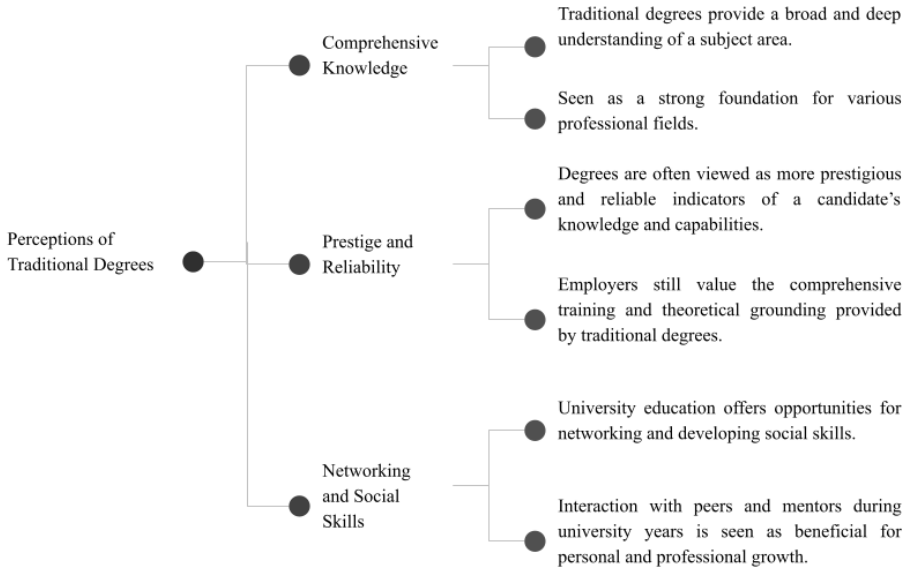
> *Previously, our ministry primarily required a basic teaching degree. However, as our department's focus shifted towards technology, we increasingly needed people skilled in areas like cloud computing and big data. This shift made it challenging to find candidates with the right expertise. To bridge this gap, we encouraged team members to pursue specialised certifications, such as the Google Cloud credential, which covers essential skills in workspaces and big data. Initially, there was some concern that gaining these credentials would be overwhelming. However, with micro-credentials, learning is structured in small, manageable parts, allowing our team to build skills gradually.*

The comprehensive excerpts above elucidate that micro-credentials are highly valued for delivering practical, job-ready skills that correspond with technological advancements, thereby broadening candidates' competencies. This is corroborated by Scandurra et al. (2023), who assert that narrowing the gap between graduates' skills and labour market requirements ultimately enhances their employment prospects.

Theme 2: Perceptions of Traditional Degrees

The following codes elucidate a dual perspective on the evolving hiring preferences among employers, who now seek a harmonious balance between theoretical knowledge and practical skills (refer to Figure 2).

Figure 2: Perceptions of traditional degrees



A Group CEO from a rapidly expanding technology industry of a creative AI tools company based in Malaysia shared his insights on sourcing the right talents. He emphasised,

> *To be honest with you on marketability, the graduate pool in Malaysia is not that bad in comparison to many other developing countries. It can always improve, of course. But with regards to hiring people for my industry, there hasn't really been an issue in terms of how people would look on paper, in terms of employability. Most of the time, the key thing to make somebody very employable or very marketable will be a keenness to learn and the demonstrated ability to adapt, as well as the ability to communicate, besides doing the actual work itself.*

Further elaborating on the factors considered when hiring, he stated the importance of seeking candidates who are,

> *Somebody who is hungry enough, somebody who scores relatively well for some hard subjects, and somebody who demonstrates the willingness and capabilities to adapt according to changing circumstances.*

A senior executive from a global construction and engineering company noted statements that were echoed by a senior executive in the recruitment industry,

> *Malaysian graduates are generally marketable due to their diverse educational backgrounds and multilingual abilities. However, those who go the extra mile to pursue industry-specific programs appear more updated, adaptable and eager to learn, significantly enhancing their employability. It's crucial to remain agile and competitive by aligning with industry needs and improving soft skills, such as communication and problem-solving.*

This synthesis reflects Pham's (2021) Employability Agency Framework, which highlights the significance of adaptability, continuous learning, and effective communication as essential elements bolstering employability through proactive graduate engagement. These principles complement Tomlinson's (2017) Graduate Capital Model, which emphasises the role of traditional degree investments in human capital, enhancing graduates' marketability and economic value in a competitive job market. Collectively, these frameworks reinforce Spence's (1973) Signaling Theory by demonstrating how these attributes and investments signal a candidate's potential and value to employers.

The interviewee with over 30 years of experience in a senior management role within the Ministry of Education Malaysia highlighted a broad need for micro-credentials,

> *In fields like TVET, such as technical and vocational schools, micro-credentials are essential. Without them, these schools can't keep up with industry demands. But the pace of change is too slow. Today's cars, for instance, are so complex that specialised tools and software are required just to diagnose issues. Micro-credentials are crucial for these schools to remain relevant.*

Furthermore, he pointed out,

> *These days, employers are really honing in on the actual skills and abilities candidates have. Traditional degrees give a solid foundation, but micro-credentials show specific expertise and skills. This change in how things are valued highlights the importance of micro-credentials in filling particular skill gaps in the job market.*

He also expressed a generally negative view of traditional degrees due to their slow adaptation to industry changes and needs,

> *The higher education system, whether public or private, is simply too slow to adapt to current industry needs. Universities can't update their curricula quickly enough, unlike micro-credentials, which come from market-relevant companies like Google, Microsoft, and Amazon. To stay competitive, we must adapt to them.*

He further added,

> *For example, when I needed to hire a specialist in cloud technologies like Kubernetes clusters, hardly anyone had the necessary skills. The only reliable way to find that expertise was through micro-credentials, as universities rarely cover such topics.*

According to Daellenbach (2018), the contemporary landscape of marketing education necessitates that graduates possess a multifaceted skill set, including critical and creative thinking, effective communication abilities, marketing expertise, and specific technical competencies. Furthermore, it is emphasised that knowledge is increasingly accessible beyond the boundaries of formal university settings.

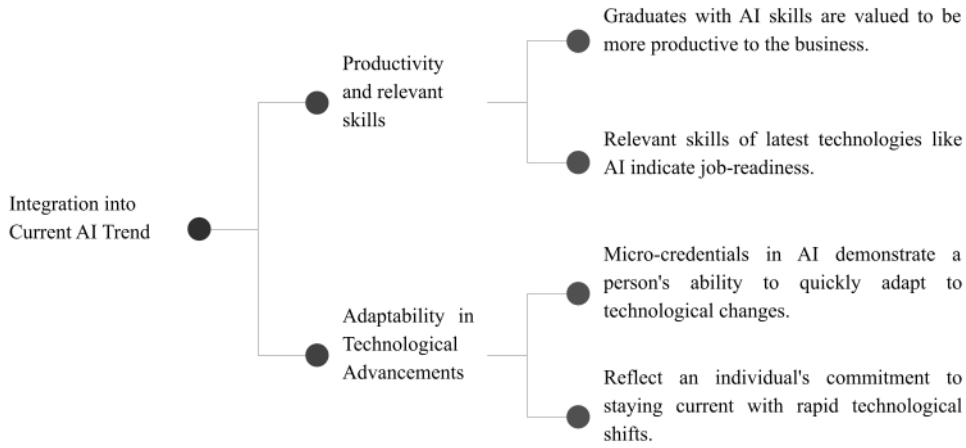
Consequently, employers value candidates who demonstrate adaptability and a commitment to continuous learning by integrating these traditional educational

pathways with micro-credentialing opportunities, enhancing their skill sets in alignment with contemporary industry demands.

Theme 3: Integration into Current AI Trend

The insights gathered from interviews with industry elites underline a growing demand for AI-related skills in the job market. Li (2022) posits that cultivating diverse skills encompassing comprehensive and specialised knowledge is instrumental in significantly enhancing employability within a technology-driven market. Candidates knowledgeable in AI and committed to continuous learning are highly sought after, as they are expected to contribute effectively to an evolving workplace (see Figure 3).

Figure 3: Integration into current AI trend



A Senior Vice President at a leading semiconductor manufacturer with over 700 employees in Malaysia mentioned,

> *Malaysian graduates should continually pursue new industry-recognised credentials to enhance their portfolios, especially with the rise of AI and automation. These credentials ensure they stay relevant amidst industry disruptions, demonstrating adaptability and readiness for evolving job requirements. By proactively upskilling in areas like AI, cybersecurity, and data science and being able to apply them in Final Year Projects or their thesis, graduates position themselves as capable of navigating and contributing to technological advancements, thereby securing long-term career growth and opportunities in a dynamic job market.*

AI integration in Malaysia exemplifies diverse, sector-specific skills. While the technology industry emphasises machine learning and data science, and manufacturing focuses on robotics and predictive maintenance, these examples are not exhaustive. Recruitment utilises AI for talent analytics, education benefits from EdTech innovations, and politics and government prioritise data-driven policymaking. Construction applies AI in project management, while engineering focuses on automation. These are illustrations of how AI skills can be applied across various

industries, highlighting flexibility rather than limitation.

Employers recognise AI-driven technologies' significance in boosting productivity and the need for a workforce capable of effectively leveraging these advancements to drive corporate growth and optimise operations. Graduates can significantly improve their job prospects by obtaining AI-focused micro-credentials and training, demonstrating their adaptability, technical skills, and commitment to staying current with industry developments. The Group CEO, who was quoted earlier, also mentioned,

> *For those who learn to use AI as a tool, new certifications will emerge focused on its application. Ultimately, AI is merely a tool, much like calculators or computers. In the future, standalone AI certifications may not be necessary. Instead, the emphasis will be on how AI enhances one's capabilities, such as becoming a better engineer with AI. Certifications will remain rooted in the core discipline, such as engineering. Likewise, consider how automation can improve welding skills. Technology serves to achieve the desired outcomes. AI itself is not the end result but an enabler, and this integration will be reflected in all traditional certifications moving forward.*

According to Rickardo and Meiriele (2023), the influence of AI technology in the workplace has become crucial for companies seeking individuals with digital and AI-related skills. Reflecting on the earlier literature from the Harvard Business Review (2023), the current job market increasingly emphasises the collaboration of humans empowered by AI rather than choosing between the two. Graduates prioritising continuous learning and technological adaptability are anticipated to succeed in the competitive, AI-integrated landscape. The Creative Director, who was quoted earlier, also mentioned,

> *While many worried that AI's image-generating capabilities would greatly affect jobs in the creative field, we were among the first to be disrupted. As a result, we have been actively upskilling and utilising AI technology to enhance our design processes, which allows us to maintain our relevance in the market.*

A remark from the esteemed former Prime Minister and an active political figure, who dedicated decades to shaping contemporary Malaysia, encapsulates the comprehensive approach to equipping graduates for future challenges,

> *During my tenure as Minister for Education, I emphasised to educational institutions that while they primarily focus on imparting knowledge in specific fields, knowledge alone is not enough; students must also develop strong character.*
>
> *Graduates should prioritise continuous upskilling to remain competitive in the job market. Education is a lifelong journey that doesn't end with a degree. After university, the focus shifts to practical learning. For instance, if starting a business isn't an option yet, working in various roles, even unrelated ones, can teach valuable business insights. In an extreme example, an engineer may work as a waiter; while the pay may not be ideal, the experience is valuable.*
>
> *Modern education must also include emerging knowledge, new technology, and IT skills. Today, utilising IT and AI effectively in the workplace is essential.*

Training on how to leverage AI to enhance performance is crucial for preparing students to thrive in a technology-driven environment.

Examining these findings, in conjunction with existing literature such as Varadarajan et al. (2023), illustrates a global trend toward the growing acceptance of micro-credentials, particularly in technology-driven sectors. In contrast, it is important to acknowledge the unique context in Malaysia, where traditional degrees maintain substantial foundational significance. These degrees are increasingly complemented, rather than replaced, by micro-credentials and AI-related skill sets. Furthermore, educational institutions should be aware that employers frequently prioritise soft skills, including communication, problem-solving, and collaboration, which are vital in the job market irrespective of the candidate's degree or credential type (Van Pham and Dao, 2020). Consequently, employers typically prefer a blend of relevant skills, experience, and credentials that align with the specific demands of the job role (Fuller and Raman, 2017).

Discussion

The study revealed a consistent emphasis across sectors, including technology, manufacturing, recruitment, education, politics, government, construction, and engineering, as well as insights from a former Malaysian prime minister on critical workforce traits such as adaptability, technical proficiency, and forward-thinking skills. Reflecting Tomlinson's (2017) Graduate Capital Model, industry leaders highlight the importance of diverse forms of capital, such as technical expertise and adaptability, which micro-credentials are uniquely positioned to enhance. In line with Pham's (2021) Employability Agency Framework, the study illustrates that graduates must actively cultivate skill sets, such as AI, to meet shifting industry demands. Furthermore, Spence's (1973) Signaling Theory underscores how micro-credentials and AI competencies indicate a candidate's immediate job readiness, helping employers assess candidates' suitability in a competitive market.

Together, these competencies provide graduates with the adaptability needed to bridge skill gaps and succeed in Malaysia's evolving job market. Integrating micro-credentials and traditional degrees represents a hybrid educational model that can enhance graduate outcomes.

Despite their potential advantages, adopting micro-credentials in Malaysia encounters considerable obstacles, mainly due to the absence of standardisation and recognition across industries. Employers may be reluctant to embrace micro-credentials because of uncertainties surrounding their consistency and equivalency compared to traditional qualifications. Therefore, there is an urgent need for the development and execution of established frameworks that ensure quality and industry recognition, thereby enhancing the credibility and acceptance of micro-credentials in the job market.

Employers assess candidates not solely based on formal educational qualifications but also on their capacity to adapt and evolve with industry dynamics. This dual emphasis indicates a paradigmatic shift where both traditional and alternative educational pathways collaboratively contribute to forming a competent workforce. This approach addresses Gauthier's (2020) findings, which reveal that employers express

dissatisfaction with employees who lack practical skills tailored to workplace needs and overall employability.

Limitations

This study is constrained by a relatively small sample size, which may not fully encompass Malaysia's industries' diverse and complex perspectives. Contributing factors include the targeted seniority level of participants, the reachability limitations within the researcher's time network and the challenges in securing appointments with high-level professionals. Future research could aim to broaden the sample to cover a wider range of sectors, facilitating a more comprehensive representation.

Practical Implications for Asian Business

Aligned with the Malaysia Education Blueprint 2013-2025 and the MySTIE-10-10 framework for future-ready education and workforce development, this study offers evidence-based insights to address the misalignment between educational outcomes and industry demands. By examining strategies to enhance the production of industry-ready graduates, the findings underscore practical approaches for empowering Malaysian businesses to achieve operational success while positioning local educational institutions as competitive entities capable of increasing the relevance and demand for their academic programs. Additionally, this research yields opportunities for other Asian countries to conduct similar studies as comparative analyses with their data, providing a deeper contextual understanding of local businesses' unique challenges and opportunities.

While traditional academic degrees retain their prestige, the increasing prominence of micro-credentials and AI-related skill sets reflects a paradigm shift in employer preferences. These emerging qualifications are recognised for their practical value in equipping graduates with industry-relevant expertise that meets the demands of a technology-driven economy. Employers increasingly emphasise integrating foundational academic knowledge with specific, in-demand skills, fostering a workforce characterised by agility and competitiveness.

Drawing upon Spence's (1973) Signaling Theory, Tomlinson's (2017) Graduate Capital Model, and Pham's (2021) Employability Agency Framework, the study positions micro-credentials and AI skills as critical indicators of job-readiness within the Malaysian context. These credentials serve as concise signals of expertise to potential employers, simultaneously functioning as strategic investments in human capital. By offering flexible learning pathways aligned with evolving market needs, these qualifications empower graduates with enhanced adaptability, enabling them to respond effectively to economic fluctuations.

Key Contributions to the Asian Business Landscape

This study highlights the critical need to align educational outputs with employer expectations to ensure a steady supply of industry-ready graduates. By advocating for integrating micro-credentials and AI skills into educational frameworks, the research underscores the importance of fostering a versatile and adaptable workforce capable of

meeting evolving industry demands, driving innovation, and enhancing Malaysian business competitiveness in the global market.

Grounded in Alali's (2022) work, 'The Contribution of Education to Economic Development', this study reinforces the importance of education as a catalyst for talent development, innovation, and economic progress. Alali's framework highlights the dual role of education in providing academic foundations and fostering practical skill development. Consistent with this perspective, the findings emphasise the necessity of strategies that enable graduates to address industrial challenges, adapt to economic shifts, and contribute effectively to a knowledge-based economy.

As Malaysia transitions toward a knowledge-based economy, aligning educational outputs with labour market demands is critical. This study offers actionable insights for policymakers and educational institutions to design academically rigorous and industry-aligned frameworks. These recommendations resonate with TalentCorp's (2023) vision for Industry-Academia Collaboration (IAC), emphasising partnerships between employers and universities to develop a steady pipeline of industry-ready talent. TalentCorp, a government agency under the Ministry of Human Resources Malaysia, focuses on building effective collaborations between industry and academia to enhance graduate employability and meet the nation's workforce needs. Ensuring an adequate supply of high-potential, high-performing workers will be essential for Asian businesses seeking to maintain competitiveness and foster sustainable growth (TalentCorp, 2023).

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