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# Rethinking Graduate Employability and Industry Readiness in Sarawak's Tertiary Sectors Through a Skills Intensity Framework

Nur Adila Latif<sup>1,\*</sup>, Abang Moasili Abang Abdul Samad<sup>1</sup>, Siti Nur-Syafiza Ahmad Saifi<sup>1</sup>

<sup>1</sup> Centre for Knowledge Advancement and Languages, i-CATS University College, 93350 Kuching, Sarawak, Malaysia

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#### **ABSTRACT**

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Tertiary sectors such as tourism, services, and education are central to Sarawak's economic development. Yet, despite expanding higher education participation, persistent skills gaps continue to challenge graduate employability. Drawing on focus group discussions with industry stakeholders and higher education representatives, this study examines the employability deficits most critical to the tertiary sectors. Findings highlight recurring weaknesses in communication, workplace discipline, digital competency, and sustainability knowledge. The paper proposes a skills-intensity framework that stratifies employability skills into universal, hybrid, and specialized levels, offering an original model for addressing workforce readiness in service-oriented economies. By focusing on the layered demands of tertiary industries, this study contributes to global debates on employability and provides policy-relevant insights for Sarawak's PCDS 2030.

#### 1. Introduction

Employability remains a global priority and research frontier [1,2]. While science, technology, engineering, and mathematics (STEM) disciplines often dominate debates on innovation, non-STEM sectors such as tourism, social services, and education and human capital are equally vital to national competitiveness and sustainable development. In Malaysia, graduate unemployment continues to be a challenge despite rising higher education participation, with employers citing concerns about graduates' readiness, particularly in soft skills and adaptability [3,4]. Sarawak's Post COVID-19 Development Strategy (PCDS 2030) envisions a skilled workforce of 30% by 2030. Although much focus falls on primary and secondary industries, the tertiary sectors remain key contributors to GDP and employment. Tourism underpins Sarawak's position as a sustainable, leading destination for ecotourism and business events in ASEAN region, while social services sector plays a role in providing a high living standard, creating an inclusive society with affordable and innovative service delivery for Sarawakian. As one of the enablers of Sarawak PCDS 2023, education and human capital sector are

E-mail address: adila.latif@icats.edu.my (Nur Adila Binti Latif)

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27

<sup>\*</sup> Corresponding author.

expected to increase workforce efficiency and bring the economies to move up the value chain. Workforce readiness in these domains is therefore essential to achieving development goals.

Existing studies often generalize employability requirements while overlooking the layered skill demands. This creates a critical gap in understanding how workforce readiness can be more effectively aligned with the realities of, which is this study, the service-oriented economies. This gap is significant, as employers in Malaysia continue to highlight persistent deficits in workplace discipline, soft skills, and digital literacy among graduates [5,6]. Addressing this gap is significant for both practice and policy, as it provides actionable insights for employers and higher education institutions while supporting Sarawak's PCDS 2030 vision of an inclusive and sustainable economy.

Therefore, this study pursues two objectives:

- 1. To examine the employability deficits most critical to the tertiary sectors; and
- 2. To develop a skills-intensity framework that stratifies employability skills into universal, hybrid, and specialized levels, offering a model for addressing workforce readiness in service-oriented economies.

#### 2. Literature Review

# 2.1 Perspectives on Employability

An expanding corpus of research highlights that graduate employability should not be conceptualized only as a binary of "employable" versus "unemployable," but rather as a spectrum of competencies that vary in depth and applicability across contexts [1,2]. Traditional models such as the graduate capital framework have illustrated the significance of human, social, and cultural capital in career success [2]. Nevertheless, they tend to be dysfunctional in its mechanisms to stratify skill demands in ways that reflect sectoral intensity. Recent reviews by Zakaria *et al.* [7] extend this by identifying hybrid competencies which are an integration of soft skills with digital fluency as increasingly essentials.

Employers in Malaysia consistently report discontent with graduates' employability skills, particularly in teamwork, communication, and adaptability [3]. According to Osman *et al.* [4], while employers rate these skills as crucial, satisfaction levels remain low. On a similar note, a study in Sarawak by Yong and Ling [8] revealed contrariety between employer and graduate perceptions. While employers emphasized teamwork, communication, and digital literacy, graduates underestimated their importance [8].

With the advancement of technology, digital skills are now considered as urgent priorities. Tee et al. [9] indicates that employers value online collaboration, digital communication, and problem-solving, yet graduates remain underprepared. Moreover, graduates' deficiency in lifelong learning and adaptability further constraint Malaysia's digital economy [10]. On the other hand, skill mismatch is another structural challenge shown by the underemployment of many graduates in jobs below their qualification level [11], suggesting a disconnection between higher education supply and employment uptake. At the regional level, ASEAN has recognized the importance of green and digital skills, with initiatives such as the proposed ASEAN Green and Digital Skills Taskforce to promote common benchmarks and cross-border recognition [12].

# 2.2 Skills-Intensity in Tertiary Sectors

Sectoral studies demonstrate the different employability skills expected across service industries. Tourism emphasizes cross-cultural communication and customer experience [13] and is increasingly shaped by digital transformation through smart tourism systems [14]. On the other hand, education requires curriculum co-design with industry, digital pedagogy, and reflective learning [15]. Conversely, social services prioritize community engagement, empathy, and ethical decision-making, often complemented by social protection systems, digital tools for case management, and data-driven welfare delivery [16,17]. However, few studies propose a structured framework to stratify these skills in service industry contexts.

The skill-intensity framework proposed in this study responds to this gap by organizing competencies into progressive layers: basic (universal), intermediate (hybrid), and advanced (specialized). This stratification offers both theoretical and practical value. Theoretically, it extends human capital and employability-capital perspectives by embedding intensity levels that reflect sector-specific demands and the pressures of digital and green transformations [7]. Practically, it provides policymakers, educators, and industry stakeholders with a structured tool to align graduate preparation with evolving labor market expectations.

The significance of such a framework lies in its timeliness. Malaysia, like much of ASEAN, is confronting persistent graduate skill mismatches, with many degree holders underemployed in positions below their qualifications [11]. At the same time, employers increasingly demand hybrid skill sets, integrating interpersonal capabilities, digital fluency, and sustainability knowledge [9].

By positioning employability as a layered construct rather than a static outcome, the skill-intensity framework provides an innovative contribution to both knowledge and practice. It recognizes that sector-specific digital and sustainability competencies in determining competitiveness in tertiary industries, while universal skills like communication and discipline remain fundamental. This makes the framework highly relevant for economies like Sarawak, where service-oriented sectors such as tourism, education, and social services are pivotal to future growth.

#### 3. Methodology

# 3.1 Research Design

This study employed a qualitative research design, utilizing focus group discussions (FGDs) to obtain in-depth perspectives from key stakeholders on graduate employability and workforce readiness. The selection of FGD over large-scale surveys or individual interviews was because it allows participants to build on one another's ideas, challenge assumptions, and reveal divergence or consensus within and across sectors [18,19]. This interactive setting enables the researcher to explore the multidimensional concept of "employability," where sectoral priorities may differ but ultimately intersect.

The focus on tourism and hospitality, social services, and education and human capital development reflects their roles as key economic sectors and critical enablers under Sarawak's PCDS 2030. Participants were purposively selected to represent a cross-industry stakeholder, ensuring diversity of perspectives across the talent ecosystem. This included representatives from government agencies, higher learning institutions, social security organizations, hospitality and food service providers, hotel and event management companies, professional service firms, and the healthcare service providers. The mix of academic and industry participants allowed for triangulation of perspectives, thereby capturing both supply-side (universities) and demand-side (employers) insights into graduate employability. Table 1 summarizes the distribution of FGD members by sector.

**Table 1**Distribution of FGD participants by sector

| Sector                      | Number of participants |
|-----------------------------|------------------------|
| Tourism and Hospitality     | 6                      |
| Services                    | 9                      |
| Education and Human Capital | 9                      |

# 3.2 Data Collection and Analysis

The FGDs were conducted in August 2025, with duration of approximately 150 minutes. Discussions were semi-structured, guided by a protocol that addressed three central themes: (i) skills gaps observed among recent graduates, (ii) minimum competencies expected from the graduates before workforce entry, and (iii) challenges faced in transitioning fresh graduates into organizational settings. The semi-structured format ensured comparability across groups while allowing flexibility to explore unanticipated issues in greater depth [20].

All discussions were recorded and transcribed verbatim for analysis. Data was analyzed using Braun and Clarke's [21] thematic analysis framework, which involved iterative stages of familiarization, coding, theme development, and refinement. Codes were generated inductively from the data, then synthesized into higher-order themes reflecting cross-sectoral patterns of employability gaps and industry expectations.

To strengthen methodological rigor and trustworthiness, researcher triangulation was used during coding to reduce interpretive bias, while data triangulation was achieved by comparing findings across sectors and aligning them with recent literature on graduate employability. This integration enhances the validity of interpretations by embedding local insights within broader scholarly and practice contexts. Furthermore, maintaining an audit trail of coding decisions and analytical memos ensured transparency in the interpretive process [22].

#### 3.3 Limitations

Similarly with all qualitative research, this study has limitations that should be acknowledged. First, the sample comprises 24 participants across three sectors, which was considerably modest. While sufficient for generating rich, context-specific insights, the findings may not be fully generalizable to all industries or geographical regions. Second, the scope of this study that focuses on the tertiary sectors means that the results reflect only part of Sarawak's broader economic ecosystem excluding insights from other areas such as manufacturing, agriculture, or mining. Third, data relied on perspectives of the stakeholders, which may be influenced by recall bias. Finally, the cross-sectional nature of the FGDs captured perspectives at a single point in time; longitudinal studies would be necessary to examine how employability expectations and gaps evolve in response to technological, policy, or economic changes. However, despite these limitations, the use of FGDs to capture group dynamics, triangulation strategies, and alignment with national and global literature enhances the credibility and transferability of the findings.

# 4. Findings

# 4.1 Key Employability Skills Gaps

The study identified four recurring gaps among non-STEM graduates across tourism and hospitality, services, and education and human capital development sectors. These gaps cut across disciplinary boundaries, highlighting systemic challenges in preparing graduates for dynamic workforce demands.

The first gap agreed by the stakeholders is communication and language proficiency. It was revealed that graduates often lack confidence in English and other workplace communication skills, leading to struggles in presentations, service recovery, and cross-cultural interactions. In tourism sector for instance, this deficiency reflected into weak guest-relations and limited complaint-handling abilities, while in services sector, gaps are persistent in documentation skills, report writing, as well as clinical notes writing in healthcare industry, other than verbal communication. In education and human capital development, deficiencies in teamwork and interpersonal skills hinder the effectiveness of knowledge transfer and collaboration.

The second gap concerns workplace discipline and professionalism. Employers noted issues of punctuality, accountability, and task ownership. In tourism sector, seasonal work cycles exposed weaknesses in reliability of the fresh graduates, while in services sector, rather than mere reluctance to take responsibility, there is a wider transition challenges, including workload management, interprofessional teamwork, and orientation quality, as well as uneven social-work competencies and gaps in empathy and cultural awareness. The stakeholders in the education and human capital sector, on the other hand, mentioned that graduates often struggled to adapt to workplace expectations.

The third gap is digital competency, where graduates possess general digital literacy but fall short in sector-specific applications. Tourism employers emphasized lack of familiarity with property management systems, online travel platforms, and POS tools. Services stakeholders highlighted gaps in digital literacy and data use, particularly competencies in electronic health records, dashboards, and informatics, while education stakeholders highlighted the lack of confidence in online collaboration platforms and data-driven problem-solving.

Finally, sustainability knowledge was also identified as underdeveloped across all three sectors. Tourism stakeholders highlighted the absence of eco-tourism awareness and compliance with health, safety, and regulatory standards. Services employers noted a lack of understanding of sustainability-oriented service delivery and ethical practices, while the education sector found limited integration of sustainability principles in workplace behaviour. Collectively, these gaps reflect misalignment between academic foundation and evolving industry demands.

# 4.2 Industry Expectations

While gaps persist, employers across the three sectors outlined a clear set of competencies they expect graduates to possess upon entering the workforce. These expectations exceed technical skills, encompassing cultural, behavioural, and digital readiness.

Tourism and hospitality employers expect consistent professionalism in customer service roles, healthcare and social services employers emphasize ethical decision-making, professional conduct, and the ability to manage client cases responsibly, and the education human capital sector stresses credibility and maturity in workplace responsibilities.

Communication and cultural intelligence also remain central to employability. In tourism and hospitality sectors, confidence in cross-cultural exchanges and fluency in English are essential for handling international visitors. Services employers emphasize effective communication with clients

as well as teamwork in multidisciplinary settings, while the education sector values communication that fosters teamwork, adaptability, and collaboration.

Apart from soft skills, digital fluency is increasingly expected as a baseline, emphasizing on applied competency rather than generic digital awareness. Employers anticipate graduates who can not only navigate but also apply sector-specific technologies effectively, specifically property management systems and online travel platforms in tourism, digital and IT literacy and data-use competencies in healthcare and social services, including Electronic Health Records (EHR), dashboards, and informatics, and collaboration platforms and data literacy in education.

Employers further highlighted the significance of teamwork, problem-solving, and adaptability. Graduates are expected to resolve workplace challenges, contribute actively to projects, and adapt to dynamic conditions such as tourism's cyclical demand patterns, client-driven services, or the dual demands of academia and industry in education and human capital development.

Finally, employers increasingly expect graduates to demonstrate sustainability awareness. This includes eco-tourism and environmental stewardship in tourism, ethical and sustainable management practices in services, and integration of responsible behaviours into educational and developmental initiatives. These expectations reflect Sarawak's broader PCDS 2030, which positions sustainability as a core driver of economic transformation.

# 4.3 Convergence of Skills Gaps

The findings from this study present a strong convergence of skills gaps across the tourism and hospitality, services, education and human capital sectors. Communication, workplace discipline, and digital fluency consistently emerged as deficiencies, cutting across all contexts of graduate employment. These observations resonate with national trends in Malaysia, where studies repeatedly identify language proficiency, accountability, and adaptability as persistent barriers to graduate employability [5,6].

In addition to these broad skills deficits, employers also pointed to difficulties fresh graduates face in transitioning into organisational settings. Commonly cited challenges include role shock, heavy workloads, and mismatched expectations between graduates and organisations [23,24]. Many new hires display limited confidence in applying their knowledge to real-world tasks, particularly when managing priorities under pressure [23,24]. Gaps also persist in navigating workplace systems and digital tools, reflecting uneven exposure during training [25,26]. Retention and sustained commitment during early service are further concerns, while in certain professional domains the absence of clear competency frameworks and structured supervision has compounded adjustment difficulties [23].

These Malaysia-specific transition difficulties mirror wider ASEAN service economies, where structural challenges such as limited English proficiency, weak problem-solving capacity, and inadequate digital literacy have decelerated the shift toward high-value service industries [10,27]. Globally, these patterns echo the skills mismatch phenomenon, where graduates are both underprepared in some areas and overqualified in others, resulting in underutilization in the labour market [11]. This mismatch undermines economic productivity, particularly in service-driven economies where interpersonal and digital skills are integral to performance, and constrains individual career trajectories [2]. The alignment of local findings with global literature accentuates the urgency of embedding sector-specific, transferable, and future-facing skills into higher education curricula.

# 4.4 Proposed Skills-Intensity Framework

To address the layered and evolving nature of skill demands, this study proposes a skills-intensity framework that stratifies employability competencies into three progressive levels, from basic, intermediate, and advanced as described in Figure 1.

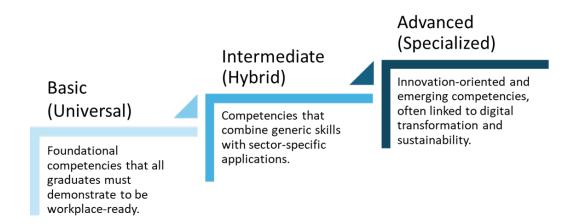


Fig. 1. Skills-Intensity Framework

This stratification enhances and extends Clarke's [1] employability capital framework, which conceptualizes graduate employability as a combination of human, social, and cultural capitals. This study builds upon this by introducing a progression model responsive to digital and green transformations that increasingly define modern workplaces. Basic or universal skills highlights the fundamental competencies that all graduates must demonstrate to be workplace-ready, regardless of the sector they are joining. For example, professional conduct, teamwork, accountability, and integrity. Next, intermediate or hybrid skills refers to the competencies that combined generic skills with sector-specific applications, such as the familiarity with PMS and POS system for tourism sector, EHR, dashboard and informatics for service sector, specifically healthcare industry, and online collaboration and e-learning for education sector. Then, advanced or specialized skills emphasize on the innovation-oriented and future-facing competencies, often linked to digital transformation and sustainability. For instance, smart tourism design and eco-tourism in tourism sector, Al-driven services and social innovation in healthcare and social services, and curriculum co-design and digital pedagogy in education sector. These aligned with contemporary studies that highlight the growing need for digitally intensive and sustainability-oriented skillsets, such as eco-tourism in hospitality, and AI integration in services, and digital pedagogy in education [7,28]. By explicitly mapping skills to intensity levels, the framework shed light on pathways for graduate development and provides higher educational institutions with a structured insights for curriculum design.

The proposed framework integrates insights from human capital theory [29], which emphasizes the role of education and training in enhancing productivity, with contemporary employability studies that critiques the narrow focus on technical skills and highlights broader, context-sensitive capabilities [1,30]. By embedding skills-intensity levels, this framework contributes theoretically by operationalizing how employability capital evolves in response to the transitions towards digital transformation and sustainability. It goes beyond binary debates of "skills gaps" versus "skills surplus" to conceptualize employability as a layered, developmental process.

Besides that, in practical, the framework offers a strategic tool for universities, industries, and policymakers. For higher education institutions, it provides a platform for embedding employability competencies into curricula in a progressive manner from foundational professional behaviours to advanced innovation skills. The implementation of short, intensive pre-graduation bootcamps could further accelerate competencies in digital fluency, including the application of generative AI, which is rapidly shaping labour market expectations.

For industries, it provides a justification for articulating skill expectations at different job tiers, enabling more effective collaboration with universities on curriculum co-design and industrial attachments. Apart from that, the results point to the importance of structured mentorship and competency-based evaluation frameworks during internships and early employment. Employers are encouraged to emphasize mastery of sectoral technologies, such as property management systems (PMS) in tourism industry, customer relationship management (CRM) platforms in services industry, and smart tourism systems in destination management. These efforts not only raise technical proficiency but also embed behavioural expectations of accountability and problem-solving.

For policymakers, it supports workforce planning aligned with national strategies such as Malaysia's PCDS 2030 and ASEAN's digital economy agenda. Embedding this framework into policy and practice could enhance graduate employability, reduce skills mismatches, and position Sarawak's workforce as globally competitive in knowledge-intensive sectors, while ensuring that graduates are equipped for both local and global labour markets.

## 5. Recommendation

# 5.1 Directions for Future Research

While this study contributes to understanding employability challenges in Sarawak's service-oriented sectors, several avenues remain open for further inquiry. First, future research could extend the skills-intensity framework to other sectors such as mining, agriculture, forestry, or manufacturing, enabling comparative analysis between the science and technology and non-science and technology domains. Second, longitudinal studies are needed to track how graduate competencies evolve over time, particularly in response to rapid technological shifts such as artificial intelligence, automation, and the green transition. Third, quantitative validation of the skills-intensity framework, such as through surveys or employability index would strengthen its generalizability and allow benchmarking across regions. Finally, cross-country comparative studies within ASEAN could explore how digital and sustainability transitions shape employability in diverse service-driven economies, providing deeper insights into regional competitiveness and workforce mobility.

#### 6. Conclusion

This study shows that employability challenges in Sarawak's tertiary sectors stem more from gaps in universal, hybrid, and future-facing competencies and less from technical deficits. Communication, workplace discipline, digital fluency, and sustainability awareness emerged as cross-sectoral concerns, reflecting global patterns of skills mismatch. By developing a skills-intensity framework, the study offers a structured model that captures progression from basic professional conduct to advanced innovation-oriented competencies, embedding the twin demands of digitalization and sustainability.

The findings carry both theoretical and practical significance. Theoretically, the framework extends employability scholarship by integrating intensity levels with human capital and employability capital perspectives. Practically, it provides universities, industries, and policymakers

with actionable pathways for curriculum design, workplace mentoring, and policy alignment with regional initiatives. Although the development of this framework was based on Sarawak's context, the framework offers transferable lessons for service-oriented economies navigating digital and green transformations, highlighting the need for workforce strategies that are both locally grounded and globally relevant.

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