

Diploma Program Framework: Driving Excellence Through Accessible and Sustainable Education

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ABSTRACT

The Diploma Program Framework is an innovation framework designed to strengthen program sustainability, academic excellence, and graduate employability across Malaysian higher education institutions (HEIs). The model is structured as a four-layer pyramid that integrates academic, professional, strategic, and visibility dimensions to drive sustainable education. At the foundation, the framework emphasises Academic Excellence through curriculum innovation and continuous teaching enhancement; Strategic Roadmap through stakeholder engagement and quality processes; and Professional Excellence through soft skills development and employability readiness. The Visibility & Branding layer focuses on reputation building and thought leadership, positioning diploma programs as reputable and future-ready. At the peak, Sustainability consolidates outcomes such as strong enrolment, active alumni networks, and quality graduate employability. In the short term (towards 2030), the framework aims to achieve high enrolment and visibility, while in the long term (towards 2039), it envisions strong alumni collaboration and positioning Malaysian diploma education as a regional benchmark for accessible and sustainable education.

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1. INTRODUCTION

In an era marked by rapid technological advancement, globalisation, and evolving labour demands, higher education institutions face growing pressure to produce graduates who are not only knowledgeable but also adaptable, employable, and socially responsible. While enrolment in universities has surged globally from 19% in 2000 to 43% in 2023, the rate of meaningful graduate employability has not kept pace. In Malaysia, the Malaysia Education Blueprint (Higher Education) 2015–2025 set a goal of increasing graduate employability from 75% to >80% by 2025. Many programs still experience a mismatch between the skills imparted and those demanded by industry, particularly in emerging domains such as digital literacy, sustainability, and soft skills. Research suggests that universities often fall short in bridging the gap between academic curricula and real-world employability competencies. Moreover, sustainability has become an imperative in education. Higher education institutions (HEIs) increasingly view themselves as change agents for sustainable development (SDGs). Recent reviews have examined how sustainability is embedded in institutional strategy, curricula, and digital transformation. In the Malaysian context, a systematic literature review showed a growing trend toward integrating sustainability into curricula and institutional practices. However, challenges remain regarding educator capacity, resource constraints, and fragmented governance. Given these twin pressures, employability and sustainability, there is a need for holistic, well-structured frameworks that guide program transformation. This diploma program framework is proposed precisely to meet that need: a four-layer model that aligns academic rigour, professional readiness, strategic planning, and branding toward long-term sustainability. This paper details its design, validation, and anticipated impact.

2. THE ROLE OF TECHNOLOGY AND AI IN EDUCATION

The rapid evolution of artificial intelligence (AI) and digital technologies has transformed the educational landscape, offering both opportunities and challenges for higher education institutions. In Malaysia, emerging research on AI-driven education identifies three main areas of impact: personalised learning, intelligent assessment systems, and academic analytics for student success prediction (Tao et al., 2024). The Malaysia AI Roadmap 2021–2025 and the MOHE Digitalisation Strategy further highlight the need to integrate AI literacy, data ethics, and digital citizenship across all levels of the curriculum (MOHE, 2023).

Incorporating AI and digital tools into teaching not only enhances engagement but also improves students' self-regulated learning. For instance, arXiv preprints by Lakulu et al. (2025) demonstrate that AI-based adaptive learning models significantly increase academic retention rates in Malaysian universities. Within the Diploma Programme Framework, such integration could be operationalised through intelligent feedback systems, automated formative assessments, and AI-supported career guidance platforms. This would position the Diploma programme at the forefront of digital transformation in higher education, balancing human-centred pedagogy with technological innovation. As the global education ecosystem transitions towards Industry 5.0, embedding AI competency and digital ethics within the academic and professional layers of the framework will be vital to sustaining graduate competitiveness in the digital economy.

3. METHODOLOGY

3.1 Research Design

This study proposed a Design for Learning (DfL) paradigm integrated with Participatory Action Research (PAR) to guide the conceptualisation and development of the Diploma Program Framework. The DfL approach was selected because it provides a systematic framework for designing, implementing, and evaluating pedagogical innovation that responds to learner needs, institutional goals, and societal trends (Jacobsen & McKenney, 2024). Unlike traditional instructional design models, DfL emphasises co-design and adaptability, allowing researchers and practitioners to iteratively refine educational elements based on empirical data and reflective feedback. This iterative nature makes DfL well suited to higher education transformation projects where context and stakeholder input are central to success (Luckin, 2022).

Integrating Participatory Action Research (PAR) complements DfL by ensuring continuous involvement of key stakeholders, lecturers, alumni, administrators, and employers through cycles of reflection, planning, action, and evaluation (Kemmis, McTaggart, & Nixon, 2014). PAR prioritises collaborative inquiry and empowers participants as co-researchers, thereby producing outcomes that are socially grounded, contextually relevant, and collectively owned. This aligns with the transformative aims of the Diploma Program Framework, which seeks to balance institutional strategy with the lived realities of learners and educators. Recent empirical work in higher education supports this synergy, demonstrating that combining DfL and PAR produces more sustainable innovations, higher adoption rates, and improved curriculum coherence (Jacobsen & McKenney, 2024; Price et al., 2024).

Thus, the DfL–PAR hybrid framework served as both a methodological foundation and a change process, bridging theoretical design principles with participatory validation mechanisms. This approach ensured that the framework evolved through evidence-based design, reflection-in-action, and iterative consensus-building among academic and professional communities.

3.2 Potential Participants and Plan for Data Collection

The study will involve multiple stakeholder groups whose insights collectively shaped the framework design:

- i) Lecturers and curriculum specialists from UiTM Cawangan Melaka ($n \approx 15$), representing academic experts and content experts responsible for the Diploma Program curriculum.
- ii) Alumni ($n \approx 20$), providing experiential feedback on graduate preparedness, employability, and curriculum relevance.
- iii) Employers of UiTM graduates ($n \approx 10$), reflecting market expectations and identifying skill mismatches in communication, digital literacy, and adaptability.
- iv) UiTM administrators and programme coordinators ($n \approx 5$), ensuring institutional alignment and policy coherence.

A combination of qualitative and participatory techniques will be used for data collection to ensure comprehensiveness and triangulation (Creswell & Poth, 2023):

- i) Focus Group Discussions (FGDs) will be conducted with lecturers and alumni to identify perceived curricular gaps, aspirations for programme modernisation, and areas for sustainability integration. FGDs provided rich, interactive data and encouraged collective reflection.
- ii) Semi-structured interviews with employers will explore workforce trends, professional expectations, and key competencies for UiTM graduates. This approach captured nuanced employer insights while allowing comparability across respondents.
- iii) Delphi rounds / expert review involved higher education specialists and pedagogical experts, who rated proposed framework components based on relevance, feasibility, and strategic impact. This iterative process enhanced reliability and expert consensus (Hsu & Sandford, 2007).
- iv) Document review included institutional strategic plans, benchmarking reports from similar diploma programmes, and national policy documents (e.g., Malaysia Education Blueprint 2015–2025; MOHE Digitalisation Strategy 2023–2025). These documents provided contextual grounding and ensured alignment with national higher education priorities.

Data collection adhered to ethical research procedures, including informed consent, voluntary participation, and the protection of confidentiality, consistent with UiTM's Research Ethics Guidelines (UiTM, 2024).

3.3 Framework Development Procedures

The development of the Diploma Program Framework was organised into three sequential and iterative phases:



Figure 1: *The Proposed Diploma Program Framework*

Phase 1: Needs Analysis and Gap Mapping

This phase mapped the current Diploma Program curriculum and identified gaps between learning outcomes and labour market requirements. Curriculum documents, course specifications, and alumni tracer studies were examined alongside qualitative insights from FGDs and interviews. Past studies revealed discrepancies in digital competence, sustainability literacy, and innovation skills, a pattern consistent with national research highlighting persistent employability gaps among Malaysian graduates (Tee et al., 2024; Bakar et al., 2024). Employer feedback was coded against global competency frameworks (e.g., UNESCO, 2023; OECD, 2022) to establish key areas of misalignment. Stakeholder workshops also identified strategic and branding deficiencies, such as limited programme visibility and an unclear professional identity. These analyses informed the conceptual priorities for the subsequent design phase.

Phase 2: Design of the Four-Layer Framework

Drawing on the DfL and PAR principles, the team proposed a Four-Layer Pyramid Framework encompassing:

- i) Academic Excellence, focusing on pedagogical reform, curriculum coherence, and evidence-based teaching innovation.
- ii) Professional Excellence, embedding employability, digital literacy, and lifelong learning competencies into programme delivery.
- iii) Strategic Roadmap, aligning programme goals with institutional sustainability and governance structures.
- iv) Visibility & Branding, addressing communication, identity-building, and external stakeholder engagement.

For each layer, we developed specific sub-components, activities, and performance indicators. We mapped logical linkages among layers to ensure vertical integration and alignment with sustainability. The design process employed storyboarding, logic modelling, and iterative peer review, consistent with best practices in DfL research (Jacobsen & McKenney, 2024; Luckin, 2022).

Phase 3: Validation and Refinement

Validation combined Delphi consensus rounds with targeted focus group sessions. Experts rated each sub-component based on relevance, feasibility, and potential impact using a 5-point Likert scale. Items achieving $\geq 75\%$ consensus were retained, following standard Delphi analytical protocols (Hsu & Sandford, 2007).

Subsequent FGDs with lecturers and administrators refined terminology, sequencing, and strategic alignment to UiTM's corporate plan. Finally, pilot feedback will be collected from one student cohort to assess the framework's feasibility, language clarity, and perceived relevance. Pilot evaluation informed minor modifications to performance indicators and implementation timelines, ensuring practical viability prior to institutional rollout.

3.4 Data Analysis

The Data will be analysed through a combination of qualitative thematic coding and quantitative consensus analysis to ensure analytical rigour and validity. Qualitative data from FGDs and interviews will be transcribed verbatim and coded inductively using NVivo 14, following Braun and Clarke's (2022) six-phase approach to thematic analysis. Codes will be iteratively refined and mapped onto the four framework layers to identify coherent thematic clusters.

For Delphi data, median and interquartile ranges (IQRs) will be computed to quantify consensus levels, and open-ended expert feedback will be thematically integrated. Consensus was defined as $\geq 75\%$ agreement, consistent with methodological standards in educational Delphi research (Hsu & Sandford, 2007). Triangulation across stakeholder groups (lecturers, alumni, employers, administrators) ensured data robustness and interpretive credibility (Creswell & Poth, 2023). Member checking and peer debriefing will be conducted at multiple stages to enhance validity and reflexivity. Through this analytical strategy, qualitative insights informed framework refinement, while quantitative consensus metrics strengthened reliability and transparency in decision-making.

4. DISCUSSION IN THE LIGHT OF RECENT RESEARCH

4.1 Addressing Employability Gaps

The framework's professional layer directly addresses documented mismatches between graduates' skills and labour market demands. Recent work emphasises the need to categorise and teach employability competencies (such as adaptability, lifelong learning, and digital skills) to bridge that gap. Research institutions also play an intermediary role in enhancing employability by coordinating skills development and market alignment. Moreover, UNESCO (2024) and Galán-Muros et al. (2025) highlight the necessity of innovative, inclusive university initiatives to embed employability broadly in higher education.

The Diploma Program Framework's Professional Excellence Layer directly addresses a persistent challenge in higher education: the mismatch between graduates' competencies and the evolving demands of the labour market. Recent studies have consistently highlighted that while university graduates often possess technical qualifications, many lack transversal competences such as critical thinking, adaptability, leadership, and digital literacy, which employers increasingly prioritise in the post-pandemic economy (Jackson et al., 2022; Succi & Canovi, 2020). To bridge this gap, higher education institutions (HEIs) are urged to categorise employability competences within curriculum design explicitly and embed them through experiential learning, internships, and cross-disciplinary projects (Jackson & Tomlinson, 2022).

In Malaysia, initiatives such as the Graduate Employability Enhancement Scheme and MyDigitalWorkforce underscore national efforts to align tertiary education with industry expectations (MOHE, 2023). Research institutions have been shown to act as vital intermediaries, linking academic training with labour market intelligence through skill-mapping, tracer studies, and partnership-driven curriculum renewal (Bakar et al., 2024). This role reinforces the Diploma Programme Framework's strategic intent to integrate employability as a structural element of programme design.

rather than a post-graduation intervention. Moreover, UNESCO (2024) and Galán-Muros et al. (2025) emphasise that employability must be embedded across all university functions, including the curriculum, assessment, and community engagement, to cultivate lifelong learners capable of navigating future workforce disruptions. By aligning with these global trends, the Diploma Program Framework demonstrates a comprehensive response to employability challenges in Malaysia and beyond.

4.2 Integrating Sustainability and Green Literacy

Recent narrative reviews confirm sustainability as a driver of transformation in higher education. Many HEIs remain challenged by fragmented governance, yet combining institutional strategy, curriculum reform, and digital integration shows promise. In Malaysia, the systematic review shows increasing integration of sustainability but calls for continuous innovation and collaboration. Embedding green awareness into the curriculum (e.g. “green curriculum exposure”) has been shown to influence entrepreneurial intentions among students positively.

Sustainability has rapidly evolved from a peripheral theme into a central driver of transformation in higher education. Recent reviews have confirmed that sustainable education frameworks must integrate environmental literacy, ethical awareness, and social responsibility across institutional structures (Aung & Hallinger, 2023). However, many HEIs still face fragmented governance and isolated sustainability initiatives, hindering systemic progress (Fuchs et al., 2022). The Diploma Program Framework addresses this gap by embedding sustainability through its Strategic Roadmap and Visibility & Branding layers, focusing on curriculum reform, stakeholder collaboration, and innovation-driven community engagement.

In Malaysia, systematic reviews show that universities are increasingly incorporating sustainability principles into teaching, learning, and campus management. However, continued innovation and cross-sectoral collaboration remain crucial for long-term impact (Saleem et al., 2023). Research by Serafini et al. 2022 indicates that “green curriculum exposure” enhances students’ environmental consciousness and entrepreneurial intention, suggesting that sustainability education not only cultivates ecological responsibility but also fosters innovation and employability. Similarly, SAGE-published studies highlight that students exposed to sustainability-oriented projects develop stronger competencies in ethical decision-making, systems thinking, and problem-solving (Chan Man Seong et al., 2025). These findings affirm that the Diploma Program Framework’s emphasis on sustainability through curriculum integration, operational practice, and community linkage is consistent with emerging evidence that holistic green literacy leads to more resilient and future-ready graduates.

4.3 Organisational Change and Institutional Sustainability

Institutional sustainability within higher education depends significantly on effective organisational change. Studies in Malaysian HEIs have found that transformational leadership, knowledge management practices, and “green teams” act as mediating mechanisms that enhance organisational performance during transitions towards sustainability (Arsawan et al., 2021; Rieg et al., 2021). These studies suggest that sustainable performance in higher education is not merely the outcome of policy adoption but of a culture of innovation fostered by leaders who inspire, empower, and engage their academic communities.

In this regard, the Diploma Program Framework’s four-layer model functions as both a strategic and operational tool to institutionalise change. Its alignment with UiTM’s mission of accessible and sustainable education demonstrates how top-level strategic intent can cascade into faculty-level transformation. The framework encourages governance structures that promote accountability, cross-departmental collaboration, and evidence-based decision-making. Hence, sustaining the Diploma Program Framework over time requires not only curricular innovation but also a leadership ecosystem that nurtures continuous improvement, participatory management, and adaptive learning within the institution.

5. SUGGESTIONS

5.1 Developing an Evidence-Based Evaluation Framework

Future research should focus on establishing an evidence-based evaluation framework to measure the long term impact of the diploma program framework on academic sustainability, employability outcomes, and institutional reputation. While the initial model presents a strategic roadmap for operational excellence, its long-term success requires systematic data collection and performance indicators. Researchers may develop a multidimensional assessment tool to evaluate the framework's outcomes using graduate satisfaction, employer feedback, and curriculum adaptability to market needs. Such a framework would provide policymakers and academic leaders with empirical data to inform curriculum reform, ensuring alignment with Malaysia's higher education blueprint 2025 and the Sustainable Development Goal 4 (SDG4), which emphasises quality and inclusive education (UNESCO, 2023; MOHE, 2023).

5.2 Integrating Digital Transformation and Learning Technologies

A key area for further exploration involves the integration of emerging technologies, particularly artificial intelligence (AI), learning analytics, and immersive tools such as virtual and augmented reality into the Diploma Programme curriculum. These innovations can enhance teaching effectiveness, personalise student learning experiences, and improve administrative efficiency. For example, AI-driven adaptive learning platforms can tailor instructional content to individual student needs, while data analytics can help monitor performance and engagement in real time (Crompton & Burke, 2023; OECD, 2022). Moreover, incorporating digital transformation strategies would future-proof the programme against disruptions similar to those experienced during the COVID-19 pandemic. This approach aligns with UiTM's Digitalisation Strategic Plan 2025 and reinforces the university's role as a leader in accessible, sustainable education.

5.3 Comparative Analysis with ASEAN Higher Education Models

To strengthen regional relevance, future studies may conduct comparative analyses between UiTM's Diploma Programme Framework and other ASEAN higher education institutions that implement similar sustainability-driven academic models. This would allow researchers to identify shared challenges, best practices, and contextual factors that influence programme effectiveness across different national systems. Such comparative research may examine dimensions such as alumni employability, curriculum governance, and partnerships with industry and government agencies (Saleem et al., 2023). Furthermore, collaboration with ASEAN Quality Assurance Network (AQAN) and the Southeast Asian Ministers of Education Organisation (SEAMEO) can provide a structured platform for benchmarking and policy learning. This regional approach would position UiTM as a thought leader in advancing sustainable and inclusive higher education in Southeast Asia.

5.4 Incorporating Green and Inclusive Education Indicators

Another significant research direction lies in embedding principles of green and inclusive education within the Diploma Programme Framework. This involves integrating sustainability literacy, environmental ethics, and social responsibility into the curriculum to nurture graduates who are both competent and conscious of their societal roles. Aligning the programme with Malaysia's National Green Technology Policy and the Education for Sustainable Development (ESD, 2030) framework would reinforce its contribution to the national sustainability agenda (UNESCO, 2024). Additionally, inclusivity measures such as universal design for learning (UDL), equitable access for students with disabilities, and gender-responsive pedagogy should be institutionalised to promote holistic and fair educational opportunities. Such enhancements would transform the Diploma Program Framework into a model of sustainability that balances economic, environmental, and social dimensions of higher education.

5.5 Expanding Alumni and Industry Engagement Models

Finally, future research could explore innovative strategies to strengthen alumni and industry engagement and sustain long-term employability outcomes. The establishment of an Excellent Alumni Association 2039 offers a promising avenue for collaborative knowledge-sharing, mentorship, and professional networking. Further investigation may examine how alumni-led initiatives and industry partnerships contribute to curriculum renewal, internship

opportunities, and community impact. According to Jackson and Tomlinson (2022), strong alumni relations not only enhance institutional branding but also create a continuous talent pipeline for industry stakeholders. This reciprocal ecosystem among academia, alumni, and employers would ensure that the Diploma programme remains responsive to evolving workforce trends while supporting UiTM's mission to produce graduates who are globally competitive, ethically grounded, and future-ready.

6. CONCLUSION

The diploma programme framework is a forward-looking, multidimensional framework designed to reposition the diploma programme as a sustainable, high-impact, and future-ready academic programme. Through its four interconnected layers, academic excellence, professional readiness, strategic coherence, and visibility & branding, the framework summarises a holistic transformation model that aligns institutional aspirations with national and global educational imperatives. This approach responds directly to contemporary challenges confronting higher education institutions (HEIs), including employability mismatches, sustainability imperatives, organisational inertia, and the accelerating integration of digital and artificial intelligence (AI) technologies into teaching and learning ecosystems.

The framework's layered design strengthens internal coherence and enhances the programme's visibility and credibility in a competitive higher education landscape. The academic excellence layer ensures that curricula are continuously refined to meet disciplinary and interdisciplinary standards while promoting research-informed pedagogy and outcome-based learning (Jackson & Tomlinson, 2022). Meanwhile, the professional readiness layer operationalises employability through embedded skill frameworks, fostering digital literacy, adaptability, and lifelong learning capacities consistent with current industry demands (Succi & Canovi, 2020; MOHE, 2023). The strategic coherence layer reinforces alignment between institutional policy, leadership, and resource management, ensuring that all developmental initiatives contribute to the university's overarching mission of inclusive excellence. Finally, the visibility and branding layer ensures sustainability through strategic communication, community engagement, and the cultivation of a distinctive academic identity that positions the particular university as a benchmark institution for transformation-driven education.

When examined through the lens of recent empirical research, the diploma program framework demonstrates strong theoretical and practical relevance. Studies on employability (Jackson et al., 2022; Bakar et al., 2024) confirm the need for structured curricular interventions to bridge the gap between academic outcomes and workforce expectations. Similarly, sustainability scholarship underscores the importance of integrating environmental literacy and social responsibility within higher education governance and pedagogy (Aung & Hallinger, 2023; Serafini et al., 2022). Furthermore, the growing influence of AI in education points to new opportunities for personalised learning, smart assessment systems, and data-driven educational innovation (Tao et al., 2024; Lakulu et al., 2025). The framework's design accommodates all these evolving dimensions, situating it within the global discourse on higher education transformation in the post-pandemic and Industry 5.0 eras.

If implemented with fidelity and sustained institutional commitment, the diploma program framework could evolve into a scalable model for other programmes within the university and beyond. Its potential for replication lies in its adaptability and its capacity to contextualise the four layers according to disciplinary needs, stakeholder expectations, and institutional missions. The model encourages iterative reflection and evidence-based improvement, promoting an agile governance culture that responds to emerging trends in education and industry. This reflective adaptability ensures that the programme remains relevant not only to the Malaysian higher education landscape but also to the broader global agenda of producing ethically grounded, technologically competent, and socially responsible graduates.

Ultimately, the diploma programme framework is more than a strategic document; it represents a paradigm shift towards integrated, values-driven, and sustainability-oriented higher education. As universities worldwide seek frameworks to navigate the uncertainties of digital disruption, economic volatility, and globalisation, the diploma programme framework stands as a model of how structured, research-informed design can foster both institutional resilience and societal progress. Its successful implementation would not only elevate the diploma programme's stature but also contribute meaningfully to Malaysia's higher education transformation agenda, advancing the nation's aspiration to become a regional hub of knowledge, innovation, and sustainable growth.

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9. AUTHORS' CONTRIBUTIONS

The authors declare that there is no conflict of interest associated with the publication of this article.

Aida Nur Mod Kodri was responsible for conceptualising the study, preparing the literature review, and overseeing the manuscript's overall structure, coherence, and final revision. Dr. Raja Mayang Delima Mohd Beta and Dr. Siti Nurul Akma Ahmad contributed to designing and formulating the research methodology. They prepared the discussion in relation to existing literature. Noor Haty Noor Azam and Milfadzhilah Mohd Jamil carried out the suggestions section and contributed to preparing the conclusion section.

All authors jointly contributed to refining the conceptual framework, critically reviewing the content, and approving the final version for submission. Their collective expertise ensured the academic rigour and methodological soundness of this study.

10. CONFLICT OF INTEREST DECLARATION

We certify that the article is the Authors' and Co-Authors' original work. The article has not received prior publication and is not under consideration for publication elsewhere. This research has not been submitted for publication, nor has it been published in whole or in part elsewhere. We attest that all authors have contributed significantly to the work, the validity and legitimacy of the data, and its interpretation for submission to IJELHE.

11. DECLARATION OF GENERATIVE AI IN THE WRITING PROCESS

During the preparation of this work, the author used ChatGPT to support language refinement, idea organisation, and clarity of expression. After using this tool, the authors reviewed and edited the content as needed and took full responsibility for the publication's content.

12. DATA AVAILABILITY/SUPPLEMENTARY MATERIALS

Data sharing does not apply to this article as no new datasets were generated or analysed during the current study.

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