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**THE MINDSET-6 FRAMEWORK: A CURRICULUM  
BLUEPRINT FOR CULTIVATING INDUSTRY 6.0-READY  
ENTREPRENEURIAL MINDSETS IN MALAYSIAN  
UNDERGRADUATES**

Faizan Iza Zainuddin<sup>1\*</sup>, Farhana Ismail<sup>2</sup>, Siti Haslina Hussin<sup>3</sup>

<sup>1</sup>Faculty of Economics and Business, Universiti Malaysia Sarawak, Malaysia

 [zfiza@unimas.com](mailto:zfiza@unimas.com)

 <https://orcid.org/0009-0003-2179-3636>

<sup>2</sup>Faculty of Economics and Business, Universiti Malaysia Sarawak, Malaysia

 [ifarhana@unimas.my](mailto:ifarhana@unimas.my)

 <https://orcid.org/0000-0002-1232-3355>

<sup>3</sup>Faculty of Education, Language and Communication, Universiti Malaysia Sarawak, Malaysia

 [hhaslina@unimas.my](mailto:hhaslina@unimas.my)

 <https://orcid.org/0009-0008-1806-9002>

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**Abstract:**

Malaysia continues to grapple with a persistent misalignment between graduate capabilities and the rapidly evolving demands of the workforce, particularly in entrepreneurial readiness and digital adaptability. Although the Ministry of Higher Education reports graduate employability rates above 80%, many employers remain concerned about graduates' limited creativity, risk appetite, and technological fluency. This paradox reveals a deeper structural issue: higher education institutions are producing academically competent yet entrepreneurially hesitant graduates. This critical review synthesizes empirical and conceptual studies published between 2019 and 2025 to identify key enablers, pedagogical innovations, and policy implications for cultivating an entrepreneurial mindset among Malaysian undergraduates. Findings suggest that attitude, perceived behavioural control, and ecosystem support are dominant predictors of entrepreneurial intention, while experiential, digital, and sustainability-oriented pedagogies strengthen mindset development. However, significant gaps persist, particularly in translating entrepreneurial intention into behaviour, integrating AI and data literacy, and embedding sustainability ethics into curricula. To address these limitations, this paper introduces the MINDSET-6 Framework, a curriculum blueprint encompassing Mindfulness and Ethics, Interdisciplinary AI and Data, Networked Learning, Design and Making, Sustainability, Entrepreneurial Finance, and Transversal 4Cs competencies. The framework positions entrepreneurship education not

as a business module but as a transformative, human-centred process aligned with Malaysia's transition toward a sustainable and digital Industry 6.0 economy.

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**Keyword:**

21<sup>st</sup>-Century Skills; Entrepreneurial Mindset; Entrepreneurship Education; Industry 6.0; Malaysian Undergraduates



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## Introduction

As Malaysia accelerates its transformation toward a digital, innovation led, and sustainability driven economy, the need for graduates who can recognise opportunities, mobilise resources, and create ethical value, either through entrepreneurship or intrapreneurial roles, has become increasingly critical. The entrepreneurial mindset, characterised by creativity, resilience, opportunity recognition, and ethical judgement, has evolved from being a desirable graduate trait into an indispensable national asset (Isa et al., 2024). Despite strong policy support for entrepreneurship education, Malaysia continues to face a worrying employability skills divide. Reports by the Ministry of Higher Education (MOHE, 2023) indicate that while graduate employment rates exceed 80%, many employers still highlight the lack of creativity, adaptability, and critical problem-solving skills among young graduates. This situation suggests that universities may be producing academically capable individuals but not necessarily innovation-oriented graduates with the cognitive agility to navigate rapidly changing, technology intensive environments.

This issue becomes even more pressing in the context of Industry 6.0, a human centred evolution of Industry 4.0 and 5.0 that merges artificial intelligence (AI), robotics, and digital ecosystems with emotional intelligence, ethics, and sustainability consciousness (Verma., 2025). Industry 6.0 envisions an economic landscape where human creativity coexists with machine intelligence, fostering a symbiotic relationship between technology and humanity (Fernández-Miguel., 2024). To thrive in this ecosystem, graduates must possess not only technical and digital competence but also an entrepreneurial mindset that balances innovation with responsibility and social impact. In this regard, higher education institutions (HEIs) in Malaysia face an urgent need to redesign their approach to entrepreneurship education. Traditional pedagogies such as static lectures or business plan competitions have proven insufficient to inspire innovation, digital literacy, and adaptive leadership. As Isa et al., (2024)

argued, entrepreneurial education mediates the relationship between students' attitudes, perceived behavioural control, and mindset development, illustrating that experiential and reflective learning are essential catalysts for transformation. Likewise, Degefu (2024) emphasised that many existing frameworks still neglect the integration of digital fluency and sustainability literacy, revealing a conceptual and pedagogical gap in preparing graduates for Industry 6.0 realities.

Against this backdrop, this study adopts a critical review approach to provide a timely synthesis of empirical and conceptual evidence, capturing emerging patterns and policy implications more dynamically than a traditional systematic review would allow. By integrating insights across multiple studies published between 2019 and 2025, this review deepens understanding of how Malaysian HEIs can cultivate entrepreneurial mindsets that are adaptive, innovative, and ethically grounded. It seeks to identify the main determinants that shape entrepreneurial mindset formation among undergraduates, evaluate pedagogical approaches that effectively promote entrepreneurial behaviour and innovation, and explore the broader policy implications for embedding human centred entrepreneurship within higher education. Through this analysis, the paper contributes to ongoing scholarly and policy conversations on transforming entrepreneurship education from mere knowledge transmission into a dynamic, mindset-oriented process. Ultimately, it argues for a paradigm shift that empowers Malaysian graduates to become not just employable workers but visionary leaders capable of driving innovation, sustainability, and social progress in the 21st century workforce.

## **Literature Review**

### ***Industry 6.0 And the Redefinition of The Entrepreneurial Mindset***

Recent scholarship conceptualises Industry 6.0 as a transformative stage that transcends efficiency driven automation by prioritising human centricity, sustainability, and intelligent data ecosystems. Verma et al., (2025) describe Industry 6.0 as the harmonisation of human creativity and machine intelligence, extending the humanistic ethos of Industry 5.0 through deeper environmental accountability and interconnected digital supply chains. This evolution implies that graduates must integrate entrepreneurial agility with AI and data literacy, alongside awareness of environmental, social, and governance imperatives. In the context of organisational design, Fernández Miguel et al., (2024) introduce the concept of conscious intelligence, embedding ecological and social reasoning within innovation processes. Such an orientation demands graduates who exhibit systems thinking, ethical reflexivity, and socio technical adaptability rather than mere risk taking or opportunity recognition. Although much of the industrial literature continues to reference Industry 5.0, emerging reviews such as Ghobakhloo (2024) and Rame et al., (2024) consistently emphasise resilience and human centred innovation as foundational to Industry 6.0. For Malaysian higher education institutions, this redefinition signals a necessary paradigm shift. Entrepreneurial mindset development must move beyond the narrow Theory of Planned Behaviour lens that focuses only on attitude and intention to include AI and data fluency, sustainability orientation, and cross disciplinary collaboration skills aligned with the industry 6.0 agenda.

### ***Determinants of Entrepreneurial Intention among Malaysian Undergraduates***

Empirical evidence from Malaysia between 2023 and 2025 refines understanding of how attitude, perceived behavioural control, education, and social norms interact to shape

entrepreneurial intention. Teoh et al., (2024) found that attitude and perceived behavioural control remain the strongest predictors of entrepreneurial intention among business undergraduates, while subjective norms play a weaker role. This suggests that Malaysian students' entrepreneurial drive is grounded more in self-efficacy and internal motivation than in external social validation. Complementary findings by Chin et al., (2024) further show that entrepreneurial self-efficacy mediates the relationship between institutional support and intention. Across ASEAN studies, motivation and self-regulation also emerge as key factors in differing institutional contexts (Ridwan et al., 2025; Nawaz, 2024), implying that mindset development must nurture goal setting, reflection, and self-directed learning. Additionally, financial literacy has proven vital. Malaysian studies such as Sufian and Wen (2024) report a positive link between financial capability and entrepreneurial aspiration, aligning with regional findings connecting technological innovativeness to entrepreneurial behaviour (Pham et al., 2023). Collectively, the evidence suggests that internal capability beliefs reinforced by financial and digital literacies and authentic experiential learning exert greater influence on entrepreneurial intention than social norms alone.

### ***Pedagogies that Transform Mindset and Behaviour***

The literature consistently highlights experiential, reflective, and problem based learning as effective pedagogical strategies for fostering entrepreneurial mindsets. Malaysian research identifies immersive components such as internships, simulations, service learning, and real client projects as vital in bridging the gap between theoretical knowledge and entrepreneurial action (Sulaiman et al., 2024; Yusoff & Hassan, 2025). These experiences cultivate the four Cs, namely creativity, critical thinking, collaboration, and communication, which underpin entrepreneurial success in Industry 6.0 contexts. Digital learning environments also play a central role. Studies show that team based online learning, WhatsApp groups, and learning analytics platforms can enhance creativity, engagement, and collaboration (Cojocariu et al., 2024; Bahari et al., 2023; Lee et al., 2023). Digital integration is therefore a key enabler for entrepreneurial behaviour in hyperconnected environments. However, the design quality of these learning experiences remains uneven. Dumitru et al., (2023) reveal that structured interventions improve higher order thinking only when accompanied by consistent scaffolding and assessment. For genuine Industry 6.0 readiness, entrepreneurship education must embed AI infused, sustainability-oriented challenge studios where students ideate, prototype, test with stakeholders, and reflect ethically. These models translate the human centred ideals of Industry 6.0 into actionable learning experiences.

### ***Persistent Gaps and Measurement Deficits***

Despite encouraging advancements, several structural gaps continue to characterise Malaysian and regional scholarship on entrepreneurship education. The first is the intention behaviour gap, where most studies stop at measuring entrepreneurial intention without examining the actual transition to entrepreneurial behaviour such as startup formation, prototype validation, or intrapreneurial initiatives. Scholars such as Xanthopoulou et al., (2024) emphasise the need for longitudinal research designs to capture behavioural translation over time. The second issue is measurement inconsistency. Many instruments used to assess entrepreneurial mindset still omit AI, digital, and sustainability dimensions (Degefu, 2024). Consequently, these constructs fail to represent the industry 6.0 paradigm that integrates data intelligence and ethical innovation.

The third gap concerns unequal ecosystem access. Entrepreneurial ecosystems remain unevenly distributed, where access to mentorship, maker spaces, incubators, and micro funding is limited, particularly in non-urban universities (Sulaiman et al., 2024). This disparity undermines inclusivity and equitable participation among students. The fourth challenge lies in outdated assessment focus. Assessment practices still prioritise business plan competitions and theoretical examinations rather than evidence of innovation, reflection, or social impact. Recent micro credential initiatives by Gamage et al., (2025) suggest that modular, skills verified pathways can serve as more credible and portable measures of entrepreneurial competence. Taken together, these structural gaps highlight that while attitude, self-efficacy, and education quality drive entrepreneurial intention, their conversion into meaningful entrepreneurial behaviour depends on ecosystem readiness, equitable access, and modernised assessment frameworks. Addressing these gaps is essential to realise the human centred and data intelligent vision of Industry 6.0 and to ensure that Malaysian graduates evolve into resilient, innovative contributors to a sustainable digital economy. Table 1 presents a summary of key empirical and conceptual studies conducted between 2019 and 2025 that illustrate these persistent gaps and emerging pedagogical trends in entrepreneurship education.

**Table 1. Summary Of Key Studies on Entrepreneurial Mindset, Pedagogy, And Industry 6.0 (2019–2025)**

<b>Author(s) &amp; Year</b>	<b>Focus of Study</b>	<b>Methodology / Sample</b>	<b>Key Findings</b>	<b>Implications</b>
<b>Isa et al., (2024)</b>	Mediating role of entrepreneurship education on mindset and intention	Quantitative (SEM) among Malaysian public university students	Experiential and reflective learning strengthen the links between attitude, perceived behavioural control, and entrepreneurial intention	Curriculum reform should integrate experiential learning and digital tools for mindset transformation
<b>Teoh et al., (2024)</b>	Determinants of entrepreneurial intention among business undergraduates	Cross-sectional survey using TPB model	Attitude and perceived behavioural control remain dominant predictors, while subjective norms are weaker	Pedagogy should emphasise self-efficacy and risk management rather than social pressure
<b>Chin et al., (2024)</b>	Institutional support, self-efficacy and entrepreneurial intention	Mixed method; university students	Mentorship and incubator access mediate intention; practical experience crucial	Strengthen campus ecosystems with mentorship and prototype-based learning
<b>Verma et al., (2025)</b>	Conceptualisation of Industry 6.0 and its relevance to mindset	Critical synthesis of industrial and educational literature	Industry 6.0 merges AI, ethics, and sustainability with human creativity	Frameworks must include empathy, digital literacy and sustainability literacy

Author(s) & Year	Focus of Study	Methodology / Sample	Key Findings	Implications
<b>Fernández Miguel et al., (2024)</b>	Concept of “conscious intelligence” in innovation processes	Conceptual paper	Integrates ecological and social reasoning into innovation	Entrepreneurship education should embed socio-technical and ethical reasoning
<b>Sufian &amp; Wen (2024)</b>	Role of financial literacy in entrepreneurial aspiration	Quantitative regression; Malaysian youth	Financial knowledge and confidence predict higher entrepreneurial intention	Incorporate financial literacy modules in entrepreneurship curriculum
<b>Bahari et al., (2023)</b>	Digital learning and creativity among students	Experimental study using online collaboration tools	Team-based digital platforms improve creativity, engagement and collaboration	Digital pedagogy supports Industry 6.0 readiness and teamwork skills
<b>Cojocariu et al., (2024)</b>	Online teamwork and entrepreneurial learning	Case-based study	Learning analytics tools enhance creative performance and digital confidence	Foster digital collaboration and self-directed learning
<b>Sulaiman et al., (2024)</b>	Experiential entrepreneurship programmes in HEIs	Multi-case institutional review	Real client projects and mentoring improve problem solving and communication skills	Unequal access limits inclusivity; need equitable ecosystem support
<b>Degefu (2024)</b>	Review of entrepreneurial mindset frameworks	Systematic regional review	Lack of AI, digital and sustainability dimensions in current constructs	Redesign mindset instruments aligned with Industry 6.0 competencies
<b>Gamage et al., (2025)</b>	Micro-credential pathways in entrepreneurship education	Qualitative and pilot implementation	Modular, skills-verified credentials enhance employability and competency recognition	Integrate micro-credentials for flexible, industry-relevant learning

Source: Scopus Database

The fourth challenge lies in **outdated assessment focus**. Assessment practices still prioritise business plan competitions and theoretical examinations rather than evidence of innovation, reflection, or social impact. Recent micro credential initiatives by Gamage et al., (2025) suggest that modular, skills verified pathways can serve as more credible and portable measures of entrepreneurial competence. Taken together, these structural gaps highlight that while attitude, self-efficacy, and education quality drive entrepreneurial intention, their conversion into

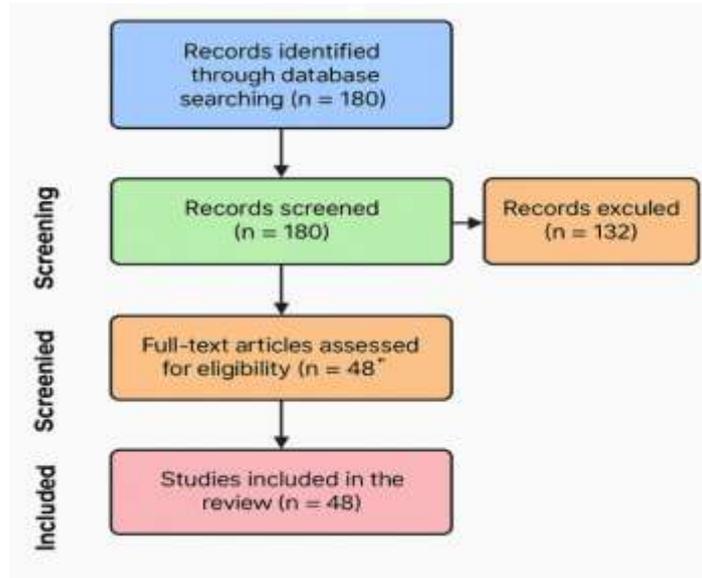
meaningful entrepreneurial behaviour depends on ecosystem readiness, equitable access, and modernised assessment frameworks. Addressing these gaps is essential to realise the human centred and data intelligent vision of Industry 6.0 and to ensure that Malaysian graduates evolve into resilient, innovative contributors to a sustainable digital economy.

### **Method (Rapid Critical Review)**

This study employed a rapid critical review design to synthesise emerging empirical and conceptual insights concerning entrepreneurial mindset development among Malaysian undergraduates within the evolving context of Industry 6.0. This design was chosen for its ability to deliver a structured yet timely synthesis of contemporary evidence within a defined timeframe (2019–2025), enabling the study to capture relevant patterns that directly inform higher education policy and practice. Unlike systematic reviews, which prioritise methodological exhaustiveness, a critical review lens interrogates the conceptual coherence, theoretical framing, and practical implications of existing studies. It moves beyond description to evaluate how well current research aligns with the human-centred, technologically integrated principles of Industry 6.0, while simultaneously challenging the over-reliance on the Theory of Planned Behaviour (TPB) as a dominant explanatory model. This approach allows for deeper reflection on whether entrepreneurial mindset scholarship adequately addresses emerging dimensions such as AI fluency, sustainability literacy, and ethical reflexivity.

### ***Search Strategy***

The review adopted a structured search strategy across major Scopus-indexed and peer-reviewed databases, including ScienceDirect, SpringerLink, Taylor & Francis Online, MDPI, Emerald Insight, and Wiley Online Library. Boolean operators were used to ensure both breadth and precision, combining key phrases such as: ("entrepreneurial mindset" OR "entrepreneurial intention") AND ("Malaysia" OR "Malaysian undergraduates") AND ("Industry 4.0" OR "Industry 5.0" OR "Industry 6.0" OR "digital skills" OR "21st century skills"). To ensure conceptual consistency and methodological rigour, only English-language journal articles, reviews, and conceptual papers published between 2019 and 2025 were included. Conference proceedings, editorials, and non-refereed reports were excluded to maintain credibility. In addition to database searches, reference lists of seminal works, such as Chin et al., (2024), Isa et al., (2024), and Verma et al., (2025), were manually screened to identify supplementary studies relevant to the Malaysian higher education context. The overall search and screening process is illustrated in Figure 1, which summarises the stages of identification, screening, eligibility assessment, and final inclusion of studies. This iterative process ensured comprehensive coverage of both direct and peripheral contributions to entrepreneurial mindset scholarship.



**Figure 1. PRISMA-Style Flow Diagram of The Review Process**

(adapted for rapid critical review design)

**Figure 1** illustrates the sequential stages of the review process based on PRISMA guidelines. A total of 180 records were initially identified through database searches. After screening and removal of duplicates, 132 records were excluded, leaving 48 full-text articles that met the inclusion criteria. These studies were subsequently appraised and synthesised for conceptual and methodological coherence with Industry 6.0.

### ***Inclusion And Exclusion Criteria***

Studies were included based on their relevance to higher education and their empirical or theoretical engagement with entrepreneurial mindset formation. Eligible papers examined at least one of the following:

- Entrepreneurial intention or mindset among Malaysian or ASEAN undergraduates.
- Entrepreneurship pedagogy or learning design in university contexts.
- Integration of Industry 4.0–6.0 competencies or 21st-century skills such as creativity, critical thinking, collaboration, communication, digital literacy, and sustainability.

Studies focusing exclusively on secondary education, vocational or informal training, or macroeconomic entrepreneurship trends unrelated to pedagogy were excluded. This selection ensured that the synthesis concentrated on pedagogical, psychological, and policy dimensions most relevant to higher education outcomes in Malaysia.

### ***Screening And Appraisal***

The initial search identified approximately 180 records. After title and abstract screening, followed by full-text evaluation, 48 studies met the inclusion criteria for final synthesis. Each article was appraised for methodological robustness (sample adequacy, instrument validity, and reliability) and contextual relevance to Malaysian or Southeast Asian higher education. The review also evaluated each study's theoretical alignment, identifying whether it drew upon

frameworks such as the Theory of Planned Behaviour, human-centred design, or Industry 6.0 paradigms. This multi-layered appraisal distinguished studies that demonstrated both empirical credibility and conceptual depth. The process ensured that evidence included in the synthesis genuinely advanced understanding of entrepreneurial mindset development in technologically advanced and human-centred educational settings.

### ***Analytical Approach***

Guided by Grant and Booth's (2009) typology for evidence synthesis, the review adopted a thematic critical synthesis rather than a meta-analytic approach, as the diversity of research designs and outcome measures did not permit quantitative aggregation.

The analysis organised studies into four interconnected thematic strands:

1. Determinants of entrepreneurial mindset and intention.
2. Pedagogical approaches and learning environments.
3. Integration of Industry 6.0 and 21st-century skill development.
4. Systemic and measurement-related gaps.

Through iterative reading, coding, and cross-referencing, the synthesis prioritised interpretive depth and cross-contextual comparison. Malaysian empirical evidence was triangulated with regional and global studies to highlight shared trends and contextual differences. Key contributions were drawn from Chin et al. (2024) on entrepreneurial intention, Isa et al. (2024) on the mediating role of entrepreneurial education, and Sufian and Wen (2024) on financial literacy as a behavioural antecedent of entrepreneurship. Together, these studies provided a cohesive foundation for examining how mindset formation intersects with pedagogy, policy, and Industry 6.0 imperatives.

### ***Ethical And Quality Considerations***

The review included only open-access or institutionally subscribed articles with transparent methodological disclosures. Each selected paper was assessed for theoretical consistency, instrument reliability, and contextual applicability to mitigate publication bias and overrepresentation of positive findings. While this review does not claim exhaustive coverage of all available literature, it prioritises conceptual validity and applied relevance to Malaysian higher education. The ultimate objective is to generate evidence-based, actionable recommendations for curriculum design, institutional practice, and policy reform that support the nation's transition toward a human-centred, innovation-driven Industry 6.0 economy.

### **Findings And Thematic Synthesis**

#### ***What the Entrepreneurial Mindset for Industry 6.0 Must Include***

Recent conceptual and empirical studies agree that Industry 6.0 represents not merely a phase of technological advancement but a holistic human-centred transformation that integrates artificial intelligence, sustainability, and emotional intelligence into organizational and societal systems. Verma et al., (2025) describe this paradigm as a production and service ecosystem that is hyper-connected, ethically grounded, and environmentally conscious, where human creativity complements machine precision in a dynamic relationship between technology and humanity. According to Fernández-Miguel et al., (2024), Industry 6.0 introduces a stage of

conscious intelligence that aligns human, social, and ecological systems. This transformation requires entrepreneurs to redefine value creation beyond efficiency and profit, focusing instead on social purpose, environmental responsibility, and collective well-being. Cultivating an entrepreneurial mindset for this new era involves nurturing ethical and sustainability literacies that emphasise responsible innovation and planetary health as highlighted by Ghobakhloo (2024). It also requires the development of systems and network thinking so that graduates can perceive enterprises as components of interconnected ecosystems rather than isolated economic actors. Equally vital is the mastery of digital, AI, and data literacy, enabling individuals to identify, interpret, and act upon opportunities arising from data-driven innovation, intelligent automation, and the Internet of Things (Verma et al., 2025). Alongside these literacies, the core competencies of creativity, critical thinking, collaboration, and communication remain essential for solving complex problems and driving cross-disciplinary innovation (Dumitru et al., 2023). Without these integrated literacies and dispositions, entrepreneurship education risks remaining confined within the mechanistic orientation of Industry 4.0 rather than advancing toward the human-driven innovation demanded by Industry 6.0.

### ***Determinants of Entrepreneurial Intention Among Malaysian Undergraduates***

Empirical research in Malaysia consistently shows that entrepreneurial intention, which serves as a psychological antecedent to entrepreneurial behaviour, is influenced by both individual cognition and the surrounding ecosystem. Chin et al., (2024) reported that attitude and perceived behavioural control are the strongest predictors of entrepreneurial intention among Malaysian business undergraduates, while subjective norms exert limited influence. This outcome aligns with the Theory of Planned Behaviour (Ajzen, 1991), which suggests that belief in one's capability has a more powerful motivational effect than social approval. Sufian and Wen (2024) further demonstrated that financial literacy, including budgeting, saving, and investment knowledge, significantly enhances students' entrepreneurial intention, implying that mindset development should integrate both cognitive and practical literacies. In a broader analysis, Fadzil, et al., (2025) synthesised findings from fifty empirical studies and identified four major domains influencing entrepreneurial intention, namely cognitive factors such as attitude and perceived feasibility, personality traits including creativity, resilience, and self-efficacy, social influences encompassing family and peer support, and educational elements such as experiential and project-based learning. Collectively, these findings indicate that nurturing an entrepreneurial mindset requires a balanced approach between internal capacity building and external environmental support. Confidence, creativity, and resilience must be fostered through learning environments that offer mentorship, authentic experiences, and institutional encouragement. This combination mirrors the holistic principles of Industry 6.0, where innovation depends equally on technical competence and socio-emotional intelligence guided by ethical awareness.

### ***Pedagogies That Move the Needle***

Pedagogical innovation represents one of the most decisive levers for transforming entrepreneurship education into genuine mindset cultivation. Research from Malaysian universities confirms that project-based, problem-based, and digital entrepreneurship pedagogies are particularly effective in promoting creativity, self-efficacy, and innovation (Sulaiman et al., 2024). Within the Malaysian TVET system, (Sulaiman et al., 2024) colleagues observed that community-oriented projects and experiential learning improved both entrepreneurial intention and social engagement, suggesting that practical exposure fosters

mindset development more effectively than conventional classroom lectures. Digital creativity has also proven to be a significant catalyst for mindset change. Cojocariu et al. (2024) found that integrating digital tools such as Canva, analytics platforms, and online content creation stimulated innovation and reflective learning among higher-education students. Similarly, Lee et al., (2023) showed that collaborative digital platforms like WhatsApp enhanced teamwork, adaptability, and communication, all of which are fundamental for entrepreneurial resilience. Ridwan et al., (2025) concluded that self-regulation and intrinsic motivation are powerful predictors of entrepreneurial intention, indicating that pedagogical approaches should prioritise reflective and autonomous learning rather than teacher-centred instruction. Despite these positive outcomes, Teoh et al., (2024) found that institutional endorsement and social norms remain relatively weak motivators compared with self-efficacy and perceived control. Hence, future pedagogical frameworks should emphasise internal empowerment through AI-infused projects, sustainability-oriented studio learning, and cross-disciplinary collaboration. Such initiatives would position Malaysian entrepreneurship education at the forefront of Industry 6.0 by uniting human creativity, ethical responsibility, and intelligent systems integration (Verma et al., 2025).

### ***Persistent Gaps***

Despite notable progress in entrepreneurship education, several enduring challenges prevent Malaysia's higher education institutions from fully realising the potential of Industry 6.0. One of the most significant issues is equity and access. Many universities still classify entrepreneurship courses as elective modules, resulting in unequal access to mentoring, incubation programmes, and digital learning infrastructure, especially in rural or under-resourced institutions (Sulaiman et al., 2024). A second limitation involves the measurement of outcomes, which continues to rely heavily on self-reported entrepreneurial intention rather than observable behaviour. Gamage et al., (2025) suggest that adopting micro-credential frameworks could improve assessment by recognising applied competencies and offering verifiable records of achievement. The conversion of entrepreneurial intention into tangible action also remains limited. Although students often display interest in entrepreneurship, few progress to concrete outcomes such as business creation, prototype validation, or intrapreneurial innovation, largely due to insufficient support ecosystems, limited funding, and weak industry linkages (Fadzil, et al., 2025). Another persistent gap lies in the inconsistent incorporation of Industry 6.0 literacies across entrepreneurship programmes. Degefu (2024) observed that many curricula continue to focus primarily on traditional business acumen while neglecting essential elements such as AI literacy, sustainability ethics, and human-centred collaboration. Without deliberate integration of these emerging literacies, entrepreneurship education risks stagnating at a transitional phase between Industry 4.0 and Industry 6.0, thus falling short of Malaysia's aspirations for a digitally advanced and sustainable innovation economy.

### ***Persistent Gaps and Summary of Key Studies***

Despite notable progress in entrepreneurship education, several enduring challenges prevent Malaysia's higher education institutions from fully realising the potential of Industry 6.0. One of the most significant issues is equity and access. Many universities still classify entrepreneurship courses as elective modules, resulting in unequal access to mentoring, incubation programmes, and digital learning infrastructure, especially in rural or under-resourced institutions (Sulaiman et al., 2024). A second limitation involves the measurement

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**Table 2: Summary Of Key Studies Related to Industry 6.0 And Entrepreneurial Mindset**

Author(s) & Year	Country / Context	Focus / Contribution
Verma et al. (2025)	India	Defined Industry 6.0 as a human-centred evolution integrating AI, robotics, sustainability, and emotional intelligence into entrepreneurial systems.
Fernández-Miguel et al., (2024)	Spain	Introduced the concept of conscious intelligence in Industry 6.0, aligning human, social, and ecological systems while emphasising ethical entrepreneurship and systems thinking.
Ghobakhloo et al., (2024)	Iran	Highlighted ethical and sustainability literacies as core components of Industry 6.0 entrepreneurship.
Dumitru et al., (2023)	Romania	Emphasised the 4Cs (creativity, critical thinking, collaboration, and communication) as key competencies for innovation in digital and entrepreneurial education.
Chin, et al., (2024)	Malaysia	Found attitude and perceived behavioural control as key predictors of entrepreneurial intention among business undergraduates.
Sufian & Wen (2024)	Malaysia	Demonstrated that financial literacy significantly strengthens students’ entrepreneurial intention.

Author(s) & Year	Country / Context	Focus / Contribution
Fadzil, et. al., (2025)	Malaysia	Conducted a systematic review identifying cognitive, personality, social, and educational factors influencing entrepreneurial intention.
Sulaiman, et. al., (2024)	Malaysia	Found that project-based and community-linked pedagogies enhance entrepreneurial self-efficacy and social engagement in TVET settings.
Cojocariu et al., (2024)	Romania	Reported that digital creativity tools such as Canva and analytics platforms enhance innovation and entrepreneurial learning outcomes.
Lee et al. (2023)	Malaysia	Showed that networked learning through WhatsApp projects improves teamwork, communication, and adaptability among students.
Ridwan et al., (2025)	Indonesia	Identified self-regulation and intrinsic motivation as strong predictors of entrepreneurial intention.
Teoh et al., (2024)	Malaysia	Found that subjective norms are weaker drivers than internal attitudes and perceived behavioural control, calling for mindset-oriented pedagogy.
Gamage et al., (2025)	Sri Lanka	Proposed that micro-credentials can quantify behavioural competencies and serve as verifiable proofs of competence.
OECD (2023)	Global	Framed micro-credentials as essential tools for lifelong learning, employability enhancement, and workforce adaptability.
Degefu (2024)	Ethiopia	Critiqued global entrepreneurship programmes for insufficient integration of AI and sustainability literacies within mindset measurement frameworks.

Resource: Scopus Database

### Proposed Framework: MINDSET-6

Drawing from the thematic synthesis, this study proposes the MINDSET-6 Framework, a curriculum design model that operationalises entrepreneurial mindset development within Malaysia's transition toward Industry 6.0. The framework bridges two domains that are often treated separately:

- a) the internal levers of entrepreneurial cognition—attitude, perceived control, and self-efficacy, and
- b) the external levers of the learning ecosystem—mentorship, collaboration, and infrastructural support.

It positions entrepreneurship education as a transformative and human-centred learning experience integrating ethics, sustainability, and digital fluency, as highlighted by Verma et al. (2025) and Fernández-Miguel et al. (2024). While earlier models emphasised business-plan writing and venture creation, MINDSET-6 reframes entrepreneurship as a process of co-creation and systemic problem-solving, aligned with the human-machine symbiosis envisioned

in Industry 6.0 (Ghobakhloo, 2024). The framework also aligns with the United Nations Sustainable Development Goals (SDGs 8 and 9) and Malaysia’s MyDIGITAL Blueprint, ensuring that entrepreneurial education contributes not only to economic resilience but also to social progress, ethical innovation, and environmental stewardship.

Importantly, MINDSET-6 addresses two persistent gaps identified in the literature:

- the intention–action gap, by embedding hands-on, project-based, and community-linked activities that move students from theoretical aspiration to tangible entrepreneurial behaviour; and
- the measurement gap, by integrating assessable, skill-verified rubrics (e.g., micro-credentials and reflective portfolios) that capture learning outcomes beyond self-reported intention.

A detailed overview of the framework and its components is presented in Table 2, followed by Figure 1, which visualises their interconnections.

**Table 3: The MINDSET-6 Framework**

Component	Description	Implementation Resources	Industry 6.0 Link
M – Mindfulness & Ethics	Reflective practice, ethical decision-making, ESG-based sustainability literacy integrated into innovation projects.	Ethics case repositories, sustainability dashboards, reflective e-portfolios.	Anchors entrepreneurial action in responsible innovation and planetary consciousness (Fernández-Miguel et al., 2024).
I Interdisciplinary AI / Data	Hands-on engagement – with open datasets, AI tools, engineering, and storytelling.	Public datasets (e.g., Kaggle, Data.gov.my), prompt open-source AI tools (TensorFlow, ChatGPT, Tableau Public).	Builds AI fluency and critical data-interpretation skills essential for digital entrepreneurship (Verma et al., 2025).
N – Networked Learning	Mentorship by industry experts and alumni collaborative projects with community partners, hackathons, and challenge studios.	Online platforms (e.g., LinkedIn ADAX), industry alumni hubs.	Expands social capital and strengthens industry connectivity, fostering collaborative innovation (Teoh et al., 2024).
D – Design & Making	Rapid prototyping, design sprints, user-centred product creation, and iterative testing.	Maker prototyping labs, 3D printers, AR/VR simulation studios.	Embeds design thinking and experimentation in entrepreneurial learning (Sulaiman et al., 2024).
S – Sustainability	Circular-economy projects, life-cycle analysis, and impact assessment within local ecosystems.	Sustainability labs, SDG innovation hubs, community-based projects.	Cultivates green innovation mindsets aligned with Industry 6.0’s sustainability

Component	Description	Implementation Resources	Industry 6.0 Link
E	Training – bootstrapping, crowdfunding, micro-funding, and model simulation.	in University crowdfunding platforms, financial-simulators, entrepreneurship grants.	agenda (Ghobakhloo, 2024).
Entrepreneurial Finance	Assessable growth in creativity, critical thinking, collaboration and communication through rubrics.	Capstone projects, peer assessment rubrics, digital storytelling reflective portfolios.	Strengthens financial literacy and resilience in venture creation (Sufian & Wen, 2024). Reinforces adaptive, human-centred competencies that transcend disciplinary boundaries (Dumitru et al., 2023).
T-6 – Transversal 4Cs			

Resource: Scopus Database



**Figure 2: The MINDSET-6 Framework: A Human-Centred Approach To Industry 6.0-Ready Entrepreneurship Education**

The figure depicts seven interconnected components—Mindfulness & Ethics, Interdisciplinary AI/Data, Networked Learning, Design & Making, Sustainability, Entrepreneurial Finance, and Transversal 4Cs—arranged in a circular formation to symbolise their interdependence. The internal cognitive elements (mindfulness, ethics, and data fluency) interact dynamically with the external ecosystem supports (networked learning, design, and finance), all anchored by sustainability. Together, these dimensions cultivate graduates who are technologically proficient, ethically grounded, and capable of transforming entrepreneurial intention into meaningful action within Malaysia’s Industry 6.0 landscape.

### ***Framework Design and Delivery***

Each MINDSET-6 module typically runs for between eight and fourteen weeks and is structured around a live or simulated Industry 6.0 challenge. Examples include AI-assisted circular waste management, digital health for rural communities, or blockchain-enabled supply-chain transparency. Students work in multidisciplinary teams to identify real-world problems, co-create prototypes, and validate their solutions through iterative testing and stakeholder engagement. Assessment within this model integrates artefacts such as prototypes and process documentation, partner feedback from mentors or industry collaborators, measured growth in the four core competencies through rubric-based reflection, and behavioural indicators such as entrepreneurial initiative, intrapreneurial improvement, or start-up progress. This comprehensive evaluation system reflects a shift from knowledge acquisition to knowledge application and aligns with global calls for experiential entrepreneurship education, as discussed by Isa et al., (2024). It also directly addresses the gap identified by Fadzil, et al., (2025), who noted the weak linkage between educational design and behavioural outcomes in traditional programmes.

### ***Pedagogical and Ecosystem Alignment***

MINDSET-6 is grounded in the principle that entrepreneurial mindset development emerges when cognitive challenge, social engagement, and ethical reflection are seamlessly integrated. Pedagogically, it draws from Kolb's experiential learning cycle comprising experience, reflection, conceptualisation, and application, but extends it into the digital era through design sprints, AI-driven analytics, and sustainability metrics. The ecosystem layer, encompassing mentors, alumni networks, incubators, and community partners, functions as a living bridge between academic learning and industrial realities. This integration addresses structural gaps long observed in Malaysian research, where entrepreneurship education has been criticised for weak institutional linkages and limited engagement with real-world practice, as highlighted by Yusoff et al., (2015) and Sulaiman et al., (2024). Strengthening these connections is essential for converting entrepreneurial intention into actionable innovation and sustainable enterprise creation. Institutional adoption of this framework would also advance the University–Industry 6.0 nexus by promoting joint studios, co-certified micro-credential modules, and collaborative innovation hubs recognised by both academia and industry as discussed by Gamage et al., (2025).

### ***Expected Outcomes and Indicators***

Implementation of the MINDSET-6 framework is expected to lead to measurable improvements across several domains. These include stronger entrepreneurial self-efficacy and behavioural intention, enhanced AI and data literacy combined with ethical reasoning, improved sustainability and systems thinking through the integration of circular-economy projects, and an increased capacity for collaborative innovation and intrapreneurial practice. Progress can be monitored using validated entrepreneurial-mindset instruments and behavioural rubrics adapted from Degefu (2024) and Gamage et al., (2025). Over time, the data generated from these assessments could provide empirical grounding for broader policy reforms in Malaysia's entrepreneurship curriculum, offering a model for scaling human-centred innovation competencies across the higher education sector.

### ***Strategic Implications***

Embedding MINDSET-6 into Malaysian higher education systems provides a strategic pathway for aligning entrepreneurship education with the national Industry 6.0 transformation agenda. The framework supports the Higher Education 4.0 Blueprint and the National Entrepreneurship Policy 2030 by equipping graduates with the digital, ethical, and sustainability competencies required for the next phase of economic evolution. Beyond enhancing employability, MINDSET-6 aims to humanise digital transformation by nurturing graduates who are both technologically proficient and ethically conscious. This integration of innovation with integrity advances the vision articulated by Fernández-Miguel et al., (2024) which views entrepreneurship as a vehicle for social responsibility and environmental stewardship. Ultimately, MINDSET-6 transforms the entrepreneurial mindset from an abstract intention into a tangible socio-technical capability. It empowers Malaysian graduates to lead innovation ecosystems that harmonise economic competitiveness with moral purpose, sustainability, and collective well-being, marking a decisive shift toward a future-ready, human-centred Industry 6.0 society.

### **Policy And Curriculum Implications for Malaysia**

The implementation of the MINDSET-6 Framework requires Malaysian higher education institutions (HEIs) to embrace a phased, systemic, and inclusive approach to entrepreneurship education that moves beyond technical training and business knowledge. Universities must embed ethical awareness, sustainability literacy, and Industry 6.0 readiness as central pillars of curriculum design. The synthesis of evidence indicates that this transformation demands close alignment between policy, pedagogy, and institutional culture, ensuring that entrepreneurial learning functions as a catalyst for human-centred and sustainable innovation rather than an isolated academic subject.

### ***Phased Implementation Strategy***

To facilitate structured adoption and ensure sustainable transformation, a three-phase national implementation plan is proposed:

- **Phase 1: Faculty Training and Assessment Reform (2025–2027)**  
Focus on capacity building among educators through workshops in AI literacy, data analytics, design thinking, and challenge-based learning. Universities should establish MINDSET-6 Teaching Hubs to train lecturers in experiential pedagogy and integrate portfolio-based assessments that capture innovation, reflection, and ethical reasoning. This phase also involves embedding micro-credential indicators within course rubrics to measure Industry 6.0 competencies.
- **Phase 2: Infrastructure and Ecosystem Investment (2027–2029)**  
Strengthen entrepreneurship ecosystems through the establishment of maker spaces, innovation studios, and virtual mentorship networks. Universities should collaborate with the Ministry of Higher Education (MOHE), local industries, and social enterprises to provide equitable access to these facilities, particularly in rural and under-resourced institutions. Investment in digital infrastructure and mentorship platforms ensures inclusivity and addresses the rural–urban gap in innovation resources.

- Phase 3: National Credentialing and Policy Integration (2029–2031)  
At the national level, MINDSET-6 indicators should be incorporated into Malaysia’s higher education quality assurance and credentialing systems, supported by the Malaysian Qualifications Agency (MQA) and industry partners. This phase aligns institutional micro-credentials with national recognition frameworks, ensuring that graduates’ competencies are verifiable, portable, and valued by employers across sectors.

Through this phased roadmap, the MINDSET-6 framework transitions from pilot implementation to system-wide adoption, ensuring coherence between curriculum design, faculty development, and national innovation policy.

### ***Re-Designing Assessment and Credentialing***

Existing assessment models that rely on theoretical examinations or business-plan competitions are insufficient for producing innovation-ready graduates. As Isa et al., (2024) argue, such methods prioritise memorisation over creative problem-solving. Universities should therefore transition to portfolio-based assessment that documents students’ practical outputs and reflective growth. This includes prototypes, user-testing results, validation reports, and ethical impact reflections. Gamage et al., (2025) highlight that micro-credentials and competency portfolios can effectively track behavioural outcomes such as creativity, collaboration, and ethical reasoning. Embedding MINDSET-6 assessment rubrics ensures students are evaluated based on applied innovation and responsibility rather than theoretical recall, supporting a national credentialing ecosystem that connects academic learning with employable innovation skills.

### ***Investing in Ecosystem and Equity***

Equitable implementation of MINDSET-6 hinges on closing the resource gap between urban and rural institutions. Research by Sulaiman et al., (2024) shows that many students from rural universities lack access to mentors, digital labs, and innovation funding. To address this, universities and policymakers must jointly invest in:

- Digital laboratories and maker spaces accessible to all faculties.
- Online mentorship networks linking students with alumni and industry experts; and
- Innovation micro-grants and incubator partnerships for early-stage projects.

These initiatives align with the Higher Education Blueprint 2025 and MyDIGITAL Blueprint 2021–2030, both of which emphasise digital empowerment and inclusivity. As Fernández-Miguel et al., (2024) emphasise, inclusivity is not only a social responsibility but a driver of creativity and system resilience within human-centred innovation ecosystems.

### ***Strengthening Faculty Capacity***

The successful integration of MINDSET-6 depends on faculty readiness to implement experiential, interdisciplinary, and AI-enhanced pedagogies. Many Malaysian academics were trained in conventional lecture-based systems, limiting their ability to facilitate innovation-

oriented learning (Fadzil et al., 2025). Universities must therefore establish Faculty Development Tracks focusing on:

- AI and data literacy for educators.
- Design thinking and human-centred innovation.
- Challenge-based and interdisciplinary teaching; and
- Collaboration with industry mentors for co-teaching.

Ghobakhloo (2024) underscores that human-centric education depends on educators who can foster adaptive, reflective, and collaborative learning cultures. Viewing lecturers as co-learners and facilitators rather than mere transmitters of content is essential to cultivating Industry 6.0-ready graduates.

### ***Embedding Real-World Industry 6.0 Challenges***

Entrepreneurship education should directly address Malaysia's strategic development priorities in digital transformation and sustainability. Curricula must embed real-world challenges related to circular economy innovation, smart agriculture, health tech, logistics, and sustainable manufacturing. Collaborations with government agencies, social enterprises, and industry laboratories can convert classrooms into innovation ecosystems. Teoh et al. (2024) found that authentic project exposure significantly boosts self-efficacy and confidence, helping students translate intention into action. Aligning these projects with SDG 8 (Decent Work) and SDG 9 (Industry, Innovation, and Infrastructure) reinforces Malaysia's dual commitment to economic resilience and global sustainability goals.

### ***Converting Intention into Action***

Bridging the intention–action gap remains a major challenge. Although many students show entrepreneurial interest, few transition into venture creation or sustained innovation after graduation (Chin et al., 2024; Fadzil et al., 2025). To close this gap, HEIs should establish structured entrepreneurial pathways, such as:

- Credit-bearing internships and incubation programmes.
- Seed-funding competitions and innovation grants.
- Industry-mentored start-up challenges; and
- Longitudinal mentoring beyond graduation.

Sufian and Wen (2024) demonstrated that financial literacy and practical exposure significantly enhance entrepreneurial persistence. Continuous mentorship and feedback loops (Gamage et al., 2025) are equally critical to sustain motivation and performance. Embedding these pathways within the MINDSET-6 ecosystem will ensure that entrepreneurship becomes a lifelong practice of creation, reflection, and innovation.

### ***Synthesis***

Implementing the MINDSET-6 framework thus requires systemic coordination among policymakers, educators, and industry. A phased national rollout, coupled with equitable infrastructure and sustained faculty development, ensures both inclusivity and long-term

impact. By aligning assessment reform, ecosystem investment, educator training, and national credentialing, Malaysian universities can transform entrepreneurial education from an academic exercise into a measurable and sustainable driver of Industry 6.0 readiness. This integrated approach not only enhances Malaysia's global competitiveness but also realises its vision of human-centred innovation and inclusive growth in the digital era.

### **Limitations And Future Research Directions**

This review integrates recent Malaysian and international scholarship on entrepreneurial mindset development within the context of Industry 6.0. However, several limitations restrict the depth and generalisability of its findings. The first limitation concerns data accessibility. Many Malaysian studies remain unpublished or stored in institutional repositories, creating an evidence gap between conceptual arguments and measurable outcomes. This limited access to comprehensive, peer-reviewed data constrains the capacity to draw robust, generalisable conclusions (Fadzil et al., 2025). Moreover, most empirical work continues to focus on entrepreneurial intention rather than actual post-graduation outcomes such as venture establishment, intrapreneurial innovation, or long-term community engagement (Chin et al., 2024). This narrow focus limits understanding of how intention translates into tangible entrepreneurial behaviour—a transition central to Malaysia's Industry 6.0 transformation agenda (Verma et al., 2025).

Another limitation arises from the methodological approach. While the rapid critical review enables timely synthesis, it cannot capture the full complexity of regional and institutional variations across Malaysia's higher education system. Differences in infrastructure, digital resources, and faculty readiness may influence the extent to which entrepreneurship education can be effectively implemented (Sulaiman et al., 2024). In addition, few studies have examined how AI and data literacy intersect with sustainability ethics in shaping the entrepreneurial mindset, a gap that persists not only in Malaysia but also internationally (Fernández-Miguel et al., 2024). Measurement constraints also remain evident. Many instruments used to evaluate the entrepreneurial mindset still rely on the Theory of Planned Behaviour (Ajzen, 1991) and related intention-based frameworks that do not adequately reflect contemporary literacies such as digital agility, ethical reasoning, and systems thinking (Degefu, 2024). These tools are insufficient for capturing the multidimensional characteristics of the entrepreneurial mindset in the context of Industry 6.0, which demands socio-technical adaptability and sustainability awareness. To advance this field, future research should pursue several interrelated directions. There is a need for longitudinal and multi-institutional studies that trace Malaysian undergraduates from the stage of intention formation to venture creation, intrapreneurial innovation, and community-based entrepreneurship. Such longitudinal evidence would provide valuable insights into behavioural persistence and the long-term effectiveness of educational interventions (Isa et al., 2024).

The development of contextually relevant measurement instruments is also crucial. Future studies should design and validate tools that incorporate AI and data literacy, sustainability consciousness, and network collaboration as integral dimensions of entrepreneurial mindset assessment (Degefu, 2024; Gamage et al., 2025). Furthermore, experimental and quasi-experimental studies should be prioritised to evaluate the MINDSET-6 framework in authentic educational environments. These investigations should measure both cognitive outcomes (knowledge acquisition, ethical reasoning, and digital fluency) and behavioural outcomes (prototype creation, start-up participation, intrapreneurial improvement, and collaboration),

providing rigorous evidence of the framework's effectiveness (Teoh et al., 2024). Cross-disciplinary and regional collaborations are equally important. Establishing research networks that include universities from East Malaysia and rural regions would enrich data diversity and foster inclusivity in entrepreneurial education research. Such collaborations would also enhance methodological robustness and policy relevance, ensuring that findings accurately reflect Malaysia's diverse educational landscape. By pursuing these directions, future scholarship can move beyond descriptive analysis toward empirically validated, evidence-based models of entrepreneurship education that are inclusive, technologically responsive, and socially sustainable. This evolution will strengthen Malaysia's capacity to produce graduates who are not only digitally competent but also ethically grounded, innovative, and resilient in the face of Industry 6.0 transformations.

## Conclusion

Preparing Malaysian undergraduates for the competitive and rapidly evolving workforce of the 21st century requires more than cultivating entrepreneurial intentions. It necessitates the development of holistic mindsets that integrate digital fluency, ethical reasoning, systems thinking, and collaborative creativity. In an economy increasingly shaped by intelligent technologies and sustainability imperatives, the ability to innovate responsibly has become a defining attribute of future-ready graduates (Verma et al., 2025; Fernández-Miguel et al., 2024). Empirical evidence from Malaysia demonstrates that attitude and perceived behavioural control remain the strongest predictors of entrepreneurial intention (Chin et al., 2024; Sufian & Wen, 2024). However, intention alone does not guarantee meaningful entrepreneurial behaviour. As highlighted by Fadzil et al., (2025) and Isa et al., (2024), the key challenge lies in transforming intention into sustained entrepreneurial action, through start-up ventures, intrapreneurial initiatives, and community-based innovations that contribute directly to Malaysia's Industry 6.0 development goals. The MINDSET-6 framework proposed in this review offers a coherent and actionable pathway to achieving this transformation. By embedding mindfulness, interdisciplinary AI and data competencies, networked learning, design and making, sustainability awareness, and entrepreneurial finance, supported by the transversal 4Cs of creativity, critical thinking, collaboration, and communication, MINDSET-6 bridges the gap between theoretical instruction and practical innovation. It provides a strategic blueprint for aligning pedagogy, assessment, and institutional ecosystems with Malaysia's policy priorities and the broader objectives of sustainable economic progress.

If widely implemented, the MINDSET-6 framework can transform entrepreneurship education from a traditional business-oriented discipline into a dynamic, human-centred innovation process. This transformation would produce graduates who are not only technologically proficient but also ethically responsible and socially conscious. In doing so, Malaysian higher education can position itself as a global model for integrating human values with digital intelligence, contributing to an inclusive and sustainable innovation ecosystem. Ultimately, MINDSET-6 envisions a generation of graduates who do not merely participate in Industry 6.0 but actively shape it through innovation, empathy, and moral purpose, driving Malaysia toward a future that harmonises economic growth with ethical and environmental stewardship. By validating and scaling the MINDSET-6 framework across Malaysian universities, entrepreneurship education can evolve into a national model of human-centred innovation aligned with Industry 6.0.

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## References

- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50(2), 179–211. [https://doi.org/10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- Ambad, S. N., Rosnan, H., & Samat, M. F. (2024). The effect of empathy, self-efficacy and perceived social support on social entrepreneurial intention among youth in Malaysia. *Journal of Entrepreneurship and Business Innovation*, 11(2). <https://doi.org/10.5296/jebi.v11i2.21963>
- Bahari, M., Abdullah, A. H., Rahim, N. A., & Ismail, I. (2023). Predicting the intention to use learning analytics for sustainable higher education (Malaysia sample). *Sustainability*, 15(21), 15190. <https://doi.org/10.3390/su152115190>
- Chin, J. W., Mustafa, M. J., & Nungsari, M. (2024). Subjective norms towards entrepreneurship and Malaysian students' entrepreneurial intentions: Does gender matter? *Asia Pacific Journal of Innovation and Entrepreneurship*, 18(2), 195–216. <https://doi.org/10.1108/APJIE-09-2023-0180>
- Chin, W. C., Teoh, M. Y., Chong, S., Yee, Y. Y., & Ravichander, S. (2024). Entrepreneurial intentions among business undergraduates: The Malaysian case. *Journal of Education for Business*, 99(7–8), 411–421. <https://doi.org/10.1080/08832323.2024.2424181>
- Cojocariu, V.-M., Stanciu, A., & Marinescu, R. (2024). Digital creativity in higher education: A literature review. *Education Sciences*, 14(11), 1189. <https://doi.org/10.3390/educsci14111189>
- Degefu, D. (2024). Entrepreneurial mindset measurement instruments: A systematic review. *F1000Research*, 13, 1020. <https://doi.org/10.12688/f1000research.157734.2>
- Dumitru, D., Drăgan, C., & Popescu, C. (2023). Experimental programs of critical-thinking enhancement in business and economics education. *Education Sciences*, 13(10), 1031. <https://doi.org/10.3390/educsci13101031>
- Fernández-Miguel, A., García-Muiña, F. E., Settembre-Blundo, D., Tarantino, S. C., & Riccardi, M. P. (2024). Exploring systemic sustainability in manufacturing: Geanthropology's strategic lens shaping Industry 6.0. *Global Journal of Flexible Systems Management*, 25(3), 579–600. <https://doi.org/10.1007/s40171-024-00404-0>
- Fernández-Miguel, A., Martínez-Corral, M., & Campos-Cano, M. (2024). Geanthropology's strategic lens shaping Industry 6.0. *Journal of Organization Design*, 13(1). <https://doi.org/10.1007/s40171-024-00404-0>
- Fadzil, N. A. F. M., Jamaluddin, M. R., Rahman, F. B. A., & Loon, K. W. (2025). A recent systematic review of key factors influencing students' entrepreneurial intentions. *International Journal of Social Science Research*, 13(1), 1–15. <https://doi.org/10.5296/ijssr.v13i1.22453>
- Gamage, K. A. A., & Dehideniya, S. C. P. (2025). Unlocking career potential: How micro-credentials are revolutionising higher education and lifelong learning. *Education Sciences*, 15(5), 525. <https://doi.org/10.3390/educsci15050525>
- Ghobakhloo, M., Mahdiraji, H. A., Iranmanesh, M., & Maroufkhani, P. (2024). From Industry 4.0 digital manufacturing to Industry 5.0 digital society: A roadmap toward human-centric, sustainable, and resilient production. *Information Systems Frontiers*. Advance online publication. <https://doi.org/10.1007/s10796-024-10476->
- Isa, M. A., Razak, M. A., & Husain, W. N. W. (2024). The mediating role of entrepreneurial education on entrepreneurial mindset among public university students in Malaysia. *International Journal of Academic Research in Business and Social Sciences*, 14(10), 172–189. <https://doi.org/10.6007/IJARBS/v14-i11/23178>

- Lee, C. E., Chern, H. H., & Azmir, D. A. (2023). WhatsApp use in a higher education learning environment: Perspective of students of a Malaysian private university on academic performance and team effectiveness. *Education Sciences*, 13(3), 244. <https://doi.org/10.3390/educsci13030244>
- Nawaz, T., Goh, G. G. G., Ong, J. W., Yasri, Y., Ali, A., & Waluyo, D. E. (2024). The catalytic role of self-regulation in the association of proactive personality with entrepreneurial intention among potential entrepreneurs. *Cogent Business & Management*, 11(1), 2366436. <https://doi.org/10.1080/23311975.2024.2366436>
- Pham, M., Nguyen, A. T. T., Tran, D. T., Mai, T. T., & Nguyen, V. T. (2023). The impact of entrepreneurship knowledge on students' e-entrepreneurial intention formation and the moderating role of technological innovativeness. *Journal of Innovation and Entrepreneurship*, 12, Article 80. <https://doi.org/10.1186/s13731-023-00351-7>
- Rame, R., et al. (2024). Industry 5.0 and sustainability: Emerging trends. *Sustainable Computing: Informatics and Systems*, 44, 101068. <https://doi.org/10.1016/j.suscom.2024.101068>
- Ridwan, M., Fiodian, V. Y., Religia, Y., & Hardiana, S. R. (2025). Investigating the effect of intrinsic and extrinsic motivation in shaping digital entrepreneurial intention: The mediating role of self-efficacy. *Asia Pacific Journal of Innovation and Entrepreneurship*, 19(3), 190–207. <https://doi.org/10.1108/APJIE-02-2024-0036>
- Roshid, M. M., Waaje, A., & Karim, R. (2025, January). Industry 6.0 as an emerging research field: A systematic and bibliometric analysis. Paper presented at the 2nd International Congress on Economics, Public Finance, Business & Social Sciences (EMIDWORLD 2024), Istanbul, Türkiye. <https://www.researchgate.net/publication/387873513>
- Sufian, A., & Wen, Y. Y. (2024). The influence of financial literacy on entrepreneurial intention among university students in Malaysia. *International Journal of Academic Research in Business and Social Sciences*, 14(8), 2582–2595. <https://doi.org/10.6007/IJARBSS/v14-i8/22288>
- Sulaiman, S., Yusof, N. L. M., & Amaran, M. A. (2024). State of entrepreneurship education in Malaysia: A comparison of entrepreneurship programs in public universities in Malaysia to international practice. *Journal of Economics and Sustainability*, 6(2), 84–103. <https://doi.org/10.32890/jes2024.6.2.5>
- Teoh, W. M. Y., Chin, W. C., Yee, Y. Y., & Ravichander, S. (2024). Entrepreneurial intentions among business undergraduates: The Malaysian case. *Journal of Education for Business*, 99(7–8), 411–421. <https://doi.org/10.1080/08832323.2024.2424181>
- Verma, A., Iqbal, M., & Hasan, R. (2025). Industry 6.0: Vision, technical landscape, and opportunities. *Alexandria Engineering Journal*, 85(2), 14–28. <https://doi.org/10.1016/j.aej.2025.08.040>
- Wan Mustapha, W. M., Mat Nawi, F. A., Baistaman, J., & Abu Bakar, H. (2025). Entrepreneurial education in Malaysia (2012–2024): Insights from a comprehensive bibliometric review. *Journal of Islamic, Social, Economics and Development*, 10(72), 527–539. <https://academicinspired.com/jised/article/view/3073>
- Yusoff, M. N. H., Zainol, F. A., & Ibrahim, M. D. B. (2015). Entrepreneurship education in Malaysia's public institutions of higher learning: A review of current practices. *International Education Studies*, 8(1), 17–28. <https://files.eric.ed.gov/fulltext/EJ1060780.pdf>