

The Role of Self-Efficacy and Business Simulation towards Entrepreneurial Traits Development

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ABSTRACT

Although entrepreneurship has been prioritized in the Twelfth Malaysia Plan (RMK-12) and the National TVET Policy, current practices remain largely theoretical and offer limited opportunities for experiential learning. In addressing this gap, the study employs a Design and Development Research (DDR) approach which focusing on the module's initial design phase. Grounded in experiential learning theory, the design process will incorporate needs analysis, literature review, and expert consultation to ensure contextual relevance and pedagogical consistency. The module also integrates interactive simulation-based activities aimed at strengthening entrepreneurial self-efficacy, decision-making, and business acumen. The first phase is known as module's conceptualization and structure. Subsequently, the phases will involve systematic validation and evaluation. The study contributes to entrepreneurship education by presenting a replicable design framework and delivering a practical, student-centred simulation tool tailored for TVET institutions.

Keywords: simulation-based, self-efficacy, TVET, entrepreneurship education

INTRODUCTION

Entrepreneurship education is vital driver of national progress, promoting innovation, strengthening economic stability, and improving graduate employability. In Malaysia, policy documents such as the Twelfth Malaysia Plan (RMK-12), the Thirteenth Malaysia Plan (RMK-13), the National TVET Policy, and the MARA Strategic Plan (2021–2025) emphasize the importance of equipping Technical and Vocational Education and Training (TVET) graduates with entrepreneurial skills. This is important to ensure graduates moving out from being job seekers to job creators (Economic Planning Unit (EPU), 2021; EPU, 2025; Majlis Amanah Rakyat (MARA), 2021). Despite these aspirations, entrepreneurship education in MARA TVET institutions still applying conventional, lecture-based delivery methods. Such approaches often fail to nurture critical entrepreneurial traits such as creativity, resilience, initiative, and the willingness to take risks (The INS News, 2022). This limitation is concerning in light of Malaysia's broader objective of preparing entrepreneurial workforce in alignment with industry 4.0 and national transformation agenda (Wan, 2025).

This study will use three theoretical perspectives, which are, situated learning theory, experiential learning theory, and human capital theory. Situated learning theory highlights that knowledge acquisition is most effective when learners engage in authentic, real-life contexts. In parallel, experiential learning theory involves experimentation, reflection, and adaptation, where knowledge is constructed through direct experience and critical assessment of outcomes. This cycle of action and reflection, which is central to entrepreneurial practice, is well supported through simulation-based instruction (Silitonga et al., 2024). Additionally, human capital theory positions education and training as investments that enhance individuals' productivity and economic contribution. By embedding structured entrepreneurship education into TVET, students' technical expertise is complemented with entrepreneurial knowledge and business acumen, thus strengthening their overall human capital (Silitonga et al., 2024). In year 2023, entrepreneurship statistic had shown that 16.3% TVET students

from 407,000 registered students involved in various entrepreneurship activities (Business Today, 2024). Additionally, about 10% of Polytechnics and community colleges have established own business after completing studies (Sinar Daily, 2023). These figures had shown that the institutions were no longer limited preparing graduates for traditional employment but is increasingly fostering entrepreneurial mindsets and self-reliance.

Self-efficacy, in other words, plays a critical role in the development of entrepreneurial traits. This is defined as confidence in one's ability to successfully undertake entrepreneurial tasks. Recent studies had shown business simulation have the potential to enhance self-efficacy (Zulfiqar et al., 2021). Yet, in MARA TVET context, entrepreneurship modules are often neither structured nor adapted to students' needs, and little empirical work has been done to examine the mediating role of self-efficacy in linking simulation-based learning to the development of entrepreneurial traits. A recent study by Rahim et al (2025) examined MARA students whose undertaken digital entrepreneurship subject and found that they exhibited weak levels of personal entrepreneurial competencies (PEC). The researchers argued that this was due to insufficiently structured and poorly aligned module with students' learning needs. They argued more innovative and experiential strategies, such as collaboration with practicing entrepreneurs and business demonstration are essential to enhance entrepreneurial readiness.

Thus, this research will develop a structured module of business simulation embedding real-world entrepreneurial decision-making and providing students with opportunities to practice problem-solving, risk assessment and business strategy in an interactive and engaging environment. Along the way to the design is the incorporation of mechanisms that can strengthen self-efficacy, positioning the module not only as a teaching tool but also as a means of shaping students' confidence in their entrepreneurial abilities (Yang, et al, 2022).

LITERATURE REVIEW

Pedagogical Factors

1. Simulation-based Instructional design

Business simulation, grounded in Kolb's (1984) Experiential Learning Theory, reframes entrepreneurship education by transforming students from passive recipients of knowledge into active decision-makers who learn through iterative cycles of experience, reflection, and conceptualization. While researchers such as Randall et al. (2025) and Levkovskyi et al. (2021) affirm its capacity to integrate experience, cognition, and behavior into a holistic learning model, others argue that simulations often prioritize engagement over genuine cognitive transformation. Existing studies highlight improvements in problem-solving, teamwork, and entrepreneurial mindsets (Akhtaruzzaman et al., 2024; Beranič & Heričko, 2022; Zulfiqar et al., 2021), yet many remain outcome-focused rather than process-oriented, offering limited insight into how entrepreneurial traits are internalized. Integrating self-efficacy into simulation learning presents a critical theoretical advancement, as it explains the psychological mechanisms through which experiential tasks translate into entrepreneurial behavior (Primario et al., 2024). Although emerging evidence supports the role of digital simulations in enhancing innovation and sustainable competitiveness (Chang et al., 2025), critics that without sufficient framework, such technologies risk reinforcing surface-level engagement (Petersen, 2023). Consequently, the synergistic interaction between business simulation, self-efficacy, and entrepreneurial trait development remains underexplored, particularly within Malaysia's TVET institutions, where contextual variables such as technological access and pedagogical design differ significantly. Addressing this gap, the present study extends the discourse by examining how business simulation enhances self-efficacy and entrepreneurial traits among MARA TVET students, contributing both theoretically and contextually to the evolving field of entrepreneurship education.

2. Entrepreneurial Assessment Performance

Assessment in entrepreneurship education differs from traditional academic evaluation, which often prioritizes knowledge recall over applied competence. While conventional written tests fail to capture dynamic skills such as creativity, resilience, and opportunity recognition, authentic assessments, including simulations and business

pitches, better reflect the iterative and uncertain nature of entrepreneurial practice (Secundo et al., 2021; Primario, Rippa, & Secundo, 2024). Yet, researchers differ in their emphasis: some argue that these approaches enhance practical decision-making and teamwork (Levkovskyi et al., 2021), whereas others indicate that they overlook psychological dimensions such as motivation and confidence (Petersen, 2023). Evidence increasingly shows that assessment performance correlates with entrepreneurial self-efficacy, which shapes students' belief in their capacity to act entrepreneurially (McGee et al., 2009; Randall et al., 2025). Therefore, integrating self-efficacy indicators into assessment design provides a more balanced and explanatory measure of entrepreneurial learning, linking visible behavior with the underlying psychological readiness essential for real-world entrepreneurship.

Technological Factors

1. Technological Integration

Technology is no longer a peripheral support tool but a transformative driver of entrepreneurship education, reshaping how knowledge is created, shared, and applied. While Davis's (1989) Technology Acceptance Model highlights perceived ease of use and usefulness as key determinants of digital adoption, recent studies argue that these constructs alone are insufficient to explain the dynamic learning demands of entrepreneurship (Randall et al., 2025; Akhtaruzzaman et al., 2024). Contemporary simulation-based approaches, for instance, extend beyond usability by emphasizing experiential immersion and behavioral transformation, elements often overlooked in early technology models. Furthermore, while proponents such as Levkovskyi et al. (2021) and Primario, Rippa, and Secundo (2024) assert that technology fosters creativity, collaboration, and entrepreneurial self-efficacy, critics caution that technological sophistication does not guarantee pedagogical effectiveness. Petersen (2023) contends that without intentional instructional design, digital tools risk becoming superficial add-ons rather than catalysts for deeper entrepreneurial learning. This underscores the need for digital readiness and pedagogical alignment, particularly within MARA's TVET ecosystem, where disparities in technological access and educator preparedness remain persistent (Beranič & Heričko, 2022).

Human Factors

1. Student Engagement

Traditional classroom participation often promotes surface-level engagement, business simulations provide deeper experiential involvement by exposing students to real-world entrepreneurial challenges (Levkovskyi et al., 2021). Researchers argue that such immersive engagement enhances opportunity recognition and venture creation (Zhao et al., 2021; Petersen, 2023), while others indicate that sustained engagement also cultivates resilience, adaptability, and entrepreneurial intention, core attributes of entrepreneurial success (Akhtaruzzaman et al., 2024; Chang et al., 2025). Hence, engagement within simulation-based learning represents not merely participation but an active transformation of knowledge into entrepreneurial behavior.

2. Facilitative Teaching Practices

Researchers argue that this approach enables deeper cognitive processing, as educators act as mentors who scaffold learning through structured reflection, feedback, and strategic decision-making (Petersen, 2023). In contrast, directive teaching often limits students' autonomy and risk-taking, the skills essential for entrepreneurial success. Effective facilitative teaching thus requires educators to design meaningful, context-driven activities that foster reflective dialogue, entrepreneurial resilience, and a growth-oriented mindset, equipping learners to navigate uncertainty and innovation with confidence (Akhtaruzzaman et al., 2024; Chang et al., 2025).

3. Institutional Supports

Access to resources and mentorship remains a decisive factor in entrepreneurial traits development, as emphasized by the resource-based view (Barney, 1991). While traditional universities often benefit from established networks, funding channels, and structured entrepreneurial ecosystems, TVET institutions frequently operate with limited access to such support, constraining students' opportunities for venture creation and

innovation. Prior studies show that entrepreneurial traits such as resilience, opportunity recognition, and proactiveness develop effectively within environments that provide robust institutional support and mentorship structures (Fayolle & Gailly, 2015; Walter & Block, 2016; Halim et al., 2021). However, in TVET contexts where technical training dominates, these supports must be contextualized through mentorship schemes, startup incubation, and community-based entrepreneurial projects to translate technical competence into entrepreneurial capability (Aziz et al., 2020; Wan, 2025). This contrast highlights a persistent gap between resource-rich academic settings and resource-constrained vocational systems, underscoring the need for more strategic institutional interventions to strengthen entrepreneurial traits among TVET learners.

Self-Efficacy

Self-efficacy serves as a core psychological mechanism linking entrepreneurial intention, perseverance, and performance. Rooted in Bandura's (1997) social cognitive theory, it reflects one's belief in their ability to execute entrepreneurial tasks effectively. While early research viewed self-efficacy primarily as a motivational factor, recent studies position it as a predictive determinant of entrepreneurial behavior, mediating the relationship between learning experiences and venture outcomes (Ahmad & Fazal, 2022; Lee & Kim, 2024). Researchers argue that individuals with higher entrepreneurial self-efficacy demonstrate greater confidence in managing uncertainty and business complexity, leading to higher persistence and venture success. Conversely, weak self-efficacy often results in avoidance of entrepreneurial risk and reduced innovation. This contrast underscores the construct's centrality not only as an outcome of experiential learning but also as a driving force behind entrepreneurial resilience and behavioral intention.

Entrepreneurial Traits

Entrepreneurial traits refer to personal dispositions such as creativity, innovativeness, risk-taking, and proactiveness, which collectively shape entrepreneurial behavior and intention. Earlier research viewed these traits as innate or static characteristics, suggesting that entrepreneurship is limited to individuals with natural tendencies. However, contemporary researchers argue that such traits can be cultivated and enhanced through structured education and experiential learning that simulate real-world business challenges (Halim, Rahman, & Nasir, 2021; Tan & Lim, 2023). This shift reflects a growing recognition that entrepreneurial potential is learned rather than born. Moreover, emerging evidence indicates that risk-taking behavior, when combined with entrepreneurial knowledge and mindset, not only elevates entrepreneurial intention but also strengthens self-efficacy as a mediating force between traits and behavior (Caputo, Nguyen, & Delladio, 2024). This underscores a dynamic interaction where experiential learning environments, such as business simulations, reinforce the confidence and adaptability necessary for sustained entrepreneurial development.

Conceptual Framework

Conceptual Model

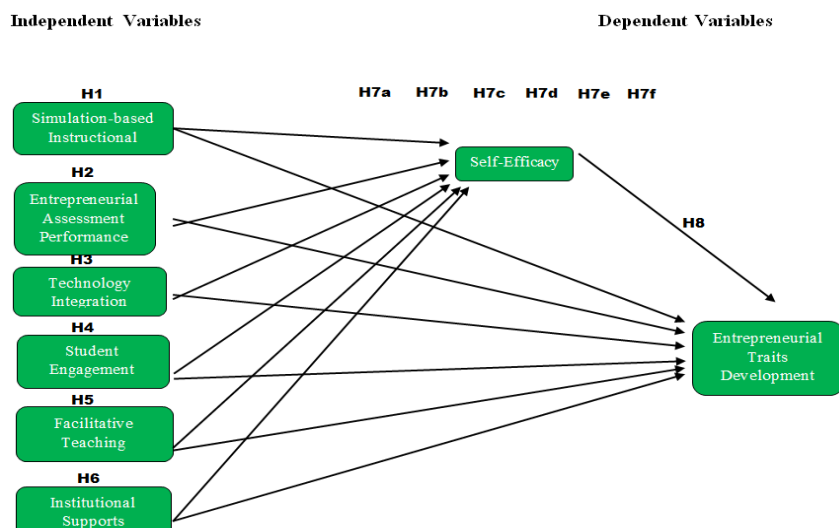


Figure 1: Conceptual Model

The independent variables in this study provide the foundation for the design of the business simulation module. In the module, these elements are embedded through experiential cycles that guide students across concrete entrepreneurial tasks. By integrating these processes, the module enables students not only to acquire entrepreneurship concepts but also to practice decision-making in realistic scenarios, transforming abstract knowledge into applied competencies. The conceptual model will apply experiential learning theory (Kolb, 1984), situated learning theory (Lave & Wenger, 1991), and human capital theory (Becker, 1993)

Hypothesis

1. Direct Effect

H1: Simulation-based instructional design has a positive effect on entrepreneurial traits development.

H2: Entrepreneurial assessment performance has a positive effect on entrepreneurial traits development.

H3: Technology integration has a positive effect on entrepreneurial traits development.

H4: Student engagement has a positive effect on entrepreneurial traits development.

H5: Facilitative teaching practices have a positive effect on entrepreneurial traits.

H6: Institutional supports have a positive effect on entrepreneurial traits development.

2. Mediating Effects of Self-Efficacy

Self-efficacy may contribute to entrepreneurial traits development. Students with higher self-efficacy are more likely to persist in entrepreneurial tasks, embrace challenges, and translate learning into entrepreneurial action (Newman et al., 2023). Therefore, self-efficacy is expected to mediate relationship between the independent variables and entrepreneurial traits development.

H7a: Self-efficacy mediates the relationship between simulation-based instructional design and entrepreneurial traits development.

H7b: Self-efficacy mediates the relationship between entrepreneurial assessment performance and entrepreneurial traits development.

H7c: Self-efficacy mediates the relationship between technology integration and entrepreneurial traits development.

H7d: Self-efficacy mediates the relationship between student engagement and entrepreneurial traits development.

H7e: Self-efficacy mediates the relationship between facilitative teaching practices and entrepreneurial traits development.

H7f: Self-efficacy mediates the relationship between institutional support and entrepreneurial traits development.

3. Overall Mediation Effect

While each independent variable contributes to entrepreneurial traits development directly, it is proposed that their collective influence is significantly enhanced through self-efficacy. In other words, the module's design, assessments, technology, engagement, pedagogy, and institutional support are most effective when they also strengthen students' confidence in their entrepreneurial abilities.

H8: Self-efficacy mediates the overall relationship between the independent variables and entrepreneurial traits development among MARA TVET students.

Future Direction

As this study is conceptual in nature, future research should focus on empirical validation of the proposed business simulation module. Quasi-experimental studies are needed to examine the extent to which simulation-based influences entrepreneurial self-efficacy and traits over time (Chang et al., 2025; Lee & Kim, 2024). Such investigations would provide evidence of the sustainability of outcomes suggested by this conceptual framework.

Furthermore, future empirical research should investigate the role of peer collaboration, social networks, and cross-disciplinary learning in strengthening entrepreneurial mindset development within simulation activities (Chang et al., 2025; Randall et al., 2025). Additionally, studies focusing on instructor competencies, facilitator training, and institutional support structures would help to determine how educational ecosystems shape the scalability and transferability of business simulation modules (Maneerattanasak & Shotlersak, 2023; Primario, Rippa, & Secundo, 2024).

Finally, exploring the impact of cultural, socioeconomic, and institutional variations on simulation-based entrepreneurship education could provide valuable insights into best practices for diverse student populations (Wan, 2025; Akhtaruzzaman et al., 2024).

CONCLUSION

This study highlights the importance of business simulation as a pedagogical tool to enhance entrepreneurial traits among MARA TVET students (Bellotti et al., 2023; Hung & Huang, 2022). Grounded in experiential learning, situated learning, and human capital theories, and incorporating self-efficacy as a mediating factor, the research emphasizes the combined influence of pedagogical design, technology integration, and human support on entrepreneurial development (Ahmad & Fazal, 2022; Newman et al., 2022).

By providing students with authentic, risk-free environments to practice decision-making, problem-solving, and strategic thinking, business simulation module fosters critical entrepreneurial traits such as creativity, proactiveness, risk-taking, and perseverance (Halim, Rahman & Nasir, 2021; Tan & Lim, 2023). The anticipated findings contribute theoretically by extending understanding of how self-efficacy mediates experiential learning in entrepreneurship education (Lee & Kim, 2024; Newman et al., 2022). Practically, validated module offers a structured, scalable, and contextually relevant tool for TVET students' readiness for entrepreneurial ventures (Almahry et al., 2022; Sabuncu & Karacay, 2023).

Ultimately, this research aligns with Malaysia's national agenda to cultivate innovative, adaptable, and entrepreneurial graduates capable of thriving in uncertain business landscapes (Economic Planning Unit, 2025; Majlis Amanah Rakyat, 2021). The study sets a foundation for future educational innovations, policy formulation, and the broader adoption of simulation-based learning to bridge the gap between theory and practice in entrepreneurship education (Randall et al., 2025; Chang et al., 2025).

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