




ISSN: 2617-6548

URL: www.ijirss.com



Career self-efficacy and entrepreneurial competence among technical and vocational education and training students in Malaysia

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Abstract

This study investigates the role of career self-efficacy in shaping entrepreneurial competence among students enrolled in Technical and Vocational Education and Training (TVET) in Malaysia. Adopting a quantitative research design, data were collected from a total of 619 students who were selected through purposive random sampling across several public TVET institutions. A validated and reliable questionnaire was used to assess the levels of career self-efficacy and entrepreneurial competence among the participants. The findings reveal a significant and positive correlation between self-efficacy and entrepreneurial competence, indicating that students with higher level of self-efficacy tend to exhibit stronger entrepreneurial skills and behaviours. These results highlight the critical role of psychological constructs particularly self-efficacy in developing entrepreneurial capacities among TVET learners. The study underscores the importance of integrating self-efficacy-focused strategies into TVET curricula and co-curricular activities, including project-based learning, mentorship and psychological support interventions. By prioritising career self-efficacy, TVET institutions can better prepare students to adapt to the dynamic demands of the labour market and entrepreneurial environments. These findings have broader implications for policymakers, educators and curriculum designers seeking to enhance the entrepreneurial potential and career adaptability of future technical professionals both in Malaysia and in similar educational contexts globally.

Keywords: Career self-efficacy, Entrepreneurial competence, Technical and Vocational Education and Training (TVET).

DOI: 10.53894/ijirss.v8i6.10111

Funding: This research is funded by the Faculty of Education, Universiti Kebangsaan Malaysia.

History: Received: 11 July 2025 / **Revised:** 15 August 2025 / **Accepted:** 18 August 2025 / **Published:** 19 September 2025

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Competing Interests: The authors declare that they have no competing interests.

Authors' Contributions: All authors contributed equally to the conception and design of the study. All authors have read and agreed to the published version of the manuscript.

Transparency: The authors confirm that the manuscript is an honest, accurate, and transparent account of the study; that no vital features of the study have been omitted; and that any discrepancies from the study as planned have been explained. This study followed all ethical practices during writing.

Institutional Review Board Statement: This study was conducted according to the guidelines of the Declaration of Helsinki and approved by the Research Ethics Committee of Universiti Kebangsaan Malaysia with reference number KBS20022024. Before the data collection was conducted, all respondents were informed about the study's objectives and the procedures involved and written consent was obtained voluntarily.

Acknowledgements: The authors would like to express their heartfelt appreciation to the Youth and Sports Department, Ministry of Youth and Sports Malaysia, for the invaluable support and assistance provided throughout the data collection process. Special thanks are also extended to the administrators, lecturers, and students of the National Youth Skills Institutes who participated in this study and contributed their time and insights.

We are deeply grateful to our academic colleagues and research advisors for their constructive feedback and encouragement during the research process. Their critical insights have significantly enhanced the quality and direction of this study.

Lastly, we wish to acknowledge the broader research and policy community involved in advancing TVET education globally, whose work continues to inspire and inform our research journey.

Publisher: Innovative Research Publishing

1. Introduction

Malaysia is currently in a phase of economic transformation that demands a continuous leap in the development of highly skilled and competitive human capital. In response to the increasingly complex and dynamic global economic challenges, the country is actively strengthening its entrepreneurship agenda as a primary strategy to reduce dependence on the conventional job sector and enhance the employability of graduates. Entrepreneurship is no longer just an alternative career choice; it has become a strategic necessity in strengthening the country's economic resilience and expanding opportunities for the creation of new jobs [1].

Efforts to strengthen the field of Technical and Vocational Education and Training (TVET) and the development of youth potential in Malaysia have been reinforced through various national policies that emphasize the production of holistic, entrepreneurial, and balanced graduates. The Malaysia Education Development Plan 2015–2025 (Higher Education) sets the goal of producing graduates who not only master technical knowledge and skills but also possess entrepreneurial attributes such as resilience, creativity, the ability to make decisions in uncertainty, and innovative problem-solving skills. In this landscape, TVET plays a crucial role as a catalyst in producing a workforce that is not only technically skilled but also capable of creating value, leading innovation, and becoming agents of change within the community. It also increases the value of a demand-driven approach, which guarantees that the information and skills imparted are pertinent to the demands of the regional labour market [2]. Therefore, TVET not only needs to equip students with relevant technical skills but also instill an entrepreneurial spirit and develop robust entrepreneurial competencies.

In line with the aspirations of the Ministry of Youth and Sports Malaysia [3] and the Malaysian Youth Action Plan 2030, the development of progressive, competitive, and balanced youth in terms of intellectual, emotional, spiritual, and physical aspects requires mastery of 21st-century skills such as critical thinking, innovation, and entrepreneurship. This development is not only instrumental in preparing youth to face global challenges but is also closely related to the construction of career self-efficacy – that is, individuals' belief in their ability to plan, manage, and execute career-related behaviors effectively [4, 5]. More importantly, the entrepreneurial elements emphasized in the policy also encourage youth to develop competencies in decision-making, problem-solving, and controlled risk-taking – all of which are important indicators in shaping career self-efficacy [6]. Recent research by Ismail, et al. [7] shows that youth involved in entrepreneurship development programs exhibit higher levels of career self-efficacy compared to those who have not undergone the same exposure, particularly in aspects of career decision-making and resilience in facing failure.

In the context of developing this competence, career self-efficacy has been identified as a significant psychological component in supporting an individual's career aspirations and achievements. Individuals with a high level of career self-efficacy tend to be more proactive in planning their career futures, including exploring entrepreneurial opportunities as a viable option, overcome arising challenges and making appropriate decisions regarding their career path [4, 5]. Furthermore, TVET students equipped with this internal confidence are more prepared to take on the risks associated with the entrepreneurial world and are capable of adapting to frequently changing environments. This shows that the formation of entrepreneurial competence not only depends on external factors such as curriculum or training but is also greatly influenced by an individual's belief in their own abilities.

High career self-efficacy enables youth to set realistic career goals, take proactive steps in seizing job opportunities, and adapt to changes in the job market [5]. According to the Ministry of Youth and Sports Malaysia [3] mastery of skills such as creativity and innovation fosters the formation of a strong career identity among youth, thereby enhancing their

confidence to face uncertainties in the current and future job market [3]. Therefore, a deeper understanding of the relationship between career self-efficacy and entrepreneurial competence among TVET students is crucial to support the nation's aspiration to produce graduates who are not only holistic and balanced but also ready to become job creators and drivers of future economic growth.

2. Literature Review

Various international studies have been conducted to understand the relationship between career self-efficacy and entrepreneurial competence among TVET students. This study encompasses different geographical contexts including the United States, England, Australia, Malaysia, Indonesia, China, Korea, Spain, Taiwan, Hungary and Malawi which collectively offer a comprehensive overview of the educational approaches and development of TVET students on a global scale.

Carter, et al. [8] emphasise that students with high levels of career self-efficacy are more likely to demonstrate strong entrepreneurial intentions. These findings are supported by a community educational environment that encourages local industry engagement. However, this approach is more structural and community-oriented rather than pedagogical. On the other hand, Thompson and Riley [9] in England present a reflective learning module specifically designed to enhance self-awareness and entrepreneurial ability. Although there was an increase in self-efficacy, the main emphasis was on the process of learning based on subjective experiences that are introspective in nature, rather than directly on practical skills.

Meanwhile, Nguyen, et al. [10] highlight the integration of Work-Integrated Learning (WIL) as the main medium in honing self-efficacy and entrepreneurial competence. Students who are directly involved with the industry show significant improvement in problem-solving confidence, adaptation to uncertainty, and innovation. This approach provides a more realistic practical dimension compared to theoretical interventions. A longitudinal study focusing on the effects of staged interventions over a two-year period conducted by Davies, et al. [11] indicates that the development of self-efficacy requires time and continuous exposure to entrepreneurial activities, meaning that the effectiveness of entrepreneurship development strategies depends on the consistency and continuity of support within the learning environment.

Whereas Walker and Greene [12] emphasise the psychosocial aspect, particularly the mentor-mentee relationship, in shaping students' self-efficacy. Mentoring functions not only as a source of technical guidance but also as a psychological driver that builds students' self-confidence and interpersonal skills. This is different from other approaches that are more focused solely on the curriculum or practical experience. Makai and Dóry [13] add a perspective from Central Europe by showing that a supportive higher education environment strengthens students' entrepreneurial intentions, in line with Walker and Greene [12] emphasis on mentor relationships in America.

A strong relationship between career self-efficacy and career adaptability of vocational students in Malaysia, showing that confidence in career abilities is fundamental to the ability to adapt in a challenging job market, an important component of entrepreneurial competence [14]. Meanwhile in the African context, Mtalika [15] underscores the critical role of a structured entrepreneurship curriculum in enhancing students' self-efficacy. These findings align with the study by Mohd Yusoff, et al. [16] which demonstrates that participation in Work-Based Learning (WBL) programs significantly enhances self-efficacy among TVET students in Malaysia and Indonesia. Both studies emphasize the importance of experiential and curriculum-driven approaches in fostering entrepreneurial confidence and readiness.

The studies conducted by Xie, et al. [17] and Ma and Chen [18] contribute to a deeper understanding of the cognitive and emotional dimensions of self-efficacy, particularly highlighting the roles of creative self-efficacy and task motivation in fostering innovative behaviour and entrepreneurial mindset among vocational students. Complementing these findings, Na and Isa [19] underscore the influence of teacher self-efficacy on student outcomes, thereby emphasizing the pivotal role of a supportive and effective teaching environment in cultivating students' career self-beliefs. Similarly, the study by Ramos-Rodriguez, et al. [20] in Spain reveals that self-efficacy significantly influences the timing of entrepreneurial initiation, illustrating a clear link between psychological readiness and entrepreneurial action. Furthermore, Cao and Han [21] shed light on the relevance of self-efficacy in the realm of digital learning, demonstrating its mediating role in enhancing student engagement within online vocational education settings. Finally, Mack, et al. [22] developed a specific assessment scale to measure the impact of the entrepreneurship curriculum in Trinidad & Tobago, demonstrating that systematic exposure to entrepreneurship education is highly significant in strengthening students' competencies. These findings highlight the importance of incorporating psychological factors into entrepreneurship education to enhance students' readiness to start a business.

Overall, this study supports the conclusion that self-efficacy, whether in the form of career, entrepreneurship, creativity or academics is a critical component in shaping the entrepreneurial competence of TVET students across various geographical contexts. Differences in methodology and cultural context provide an opportunity to gain a more comprehensive understanding of how educational strategies can be adapted to strengthen self-efficacy and subsequently enhance entrepreneurial success. Thus, research in this area emphasizes the need for a holistic approach that considers both cognitive and emotional aspects in fostering entrepreneurial success. By addressing both the practical skills and mindset development of students, educators can better prepare future entrepreneurs for the challenges they may face. This comprehensive approach can lead to more successful ventures and a greater impact on the local economy.

3. Materials and Methods

3.1. Research Design

This study uses a non-experimental quantitative design with a survey approach to examine the relationship between career self-efficacy and entrepreneurial competence among students of the National Youth Skills Institute across Malaysia.

This approach was chosen because it allows researchers to systematically obtain quantitative data from a wide range of respondents and analyse the relationships between variables through statistical tests.

3.2. Sample and Data Collection

The study population includes National Youth Skills Institute students nationwide, while the purposive sampling method is used to select respondents who meet specific criteria, namely students who have completed career development or entrepreneurship courses. This purposive selection allows the researcher to focus on individuals who have relevant experience with the study's objectives. The targeted sample size is 619 people, based on statistical power considerations as recommended by Faul, et al. [23] through G*Power analysis.

3.3. Analyzing of Data

The research instrument consists of two main scales. Career decision-making self-efficacy is measured using the Career Decision-Making Self-Efficacy Short Form (CDSE-SF) developed by Betz, et al. [24]. This scale contains 25 items that encompass five main dimensions, namely self-assessment, information gathering, goal selection, future planning, and problem-solving. Respondents were asked to rate their level of confidence in performing career tasks using a 5-point Likert scale, from 1 (very unconfident) to 5 (very confident). CDSE-SF is an instrument that has been proven valid and reliable in various studies related to career development. Meanwhile, entrepreneurial competence will be measured using the Self-Entrepreneurship Competence instrument adapted from the study that was conducted on successful entrepreneurs in Malawi, India, and Ecuador by McClelland and McBer & Co [25]. As a result of the study, 13 entrepreneurial competencies that contribute to the success of these entrepreneurs have been listed. They are initiative, seeing and seizing opportunities, perseverance, searching for information, emphasizing high work quality, commitment to work agreements, competency-oriented, making systematic plans, solving problems creatively, self-confidence, assertiveness, convincing others, able to use influence strategies. Respondents were asked to rate their level of agreement with each item using a 5-point Likert scale, from 1 (strongly disagree) to 5 (strongly agree).

Data collection is conducted online depending on student accessibility and institutional permission. Before filling out the questionnaire, all respondents were given an explanation about the study's objectives, confidentiality assurance, and the right to withdraw at any time. Informed consent was obtained in writing or in digital form before the respondents continued with the questionnaire. The data obtained were analysed using SPSS software. Descriptive analysis such as mean and standard deviation were used to determine the level of study variables. Next, inferential analysis involves Pearson correlation tests to examine the strength and direction of the relationship between variables, as well as multiple regression analysis to identify the contribution of career self-efficacy to entrepreneurial competence.

4. Results

Research findings indicate that career self-efficacy plays an important role in shaping entrepreneurial competence among TVET students, particularly students of the National Youth Skills Institute. In the context of these students, the findings indicate that students with a high level of career self-efficacy are more likely to master various aspects of entrepreneurial competence, including creativity, innovation, resilience, and problem-solving ability in uncertain situations.

A correlation of $r = .701$ demonstrates a strong and significant positive association between career self-efficacy and entrepreneurial competence. This implies that students with a strong belief in their career management capabilities are also likely to perceive themselves as competent in entrepreneurial domains such as innovation, risk-taking, and opportunity recognition.

These findings suggest that career self-efficacy serves as a foundational psychological construct that not only enhances students' adaptability in dynamic career environments but also reinforces their confidence in entrepreneurial capabilities. The strong interrelations among all variables underscore the importance of integrating self-efficacy within TVET programmes to cultivate well-rounded, future-ready entrepreneurs.

A recent study by Savugathali, et al. [26] emphasizes that career self-efficacy is a significant predictor of the development of entrepreneurial attributes among higher education students. In other words, students who are confident in their ability to manage career planning are also more prepared and competitive to take calculated risks, create opportunities and adapt in a dynamic job market. This is supported by Ibrahim [27] findings, who analyzed the impact of entrepreneurship programs significantly enhancing students' self-efficacy, which was closely related to the growth of competencies including improved decision-making skills and a more mature approach to managing business challenges. The positive effects that arise when career self-efficacy is at a high level among National Youth Skills Institute are diverse and significant.

First, it encourages the formation of a more stable career identity, which allows students to make career decisions with greater confidence and consistency [4, 28]. This indirectly reduces the rate of career indecision and instills a proactive attitude in exploring unconventional career paths such as entrepreneurship. Second, students with high career self-efficacy show a greater tendency to take the initiative in planning their future, setting long-term goals, and being bold in trying new opportunities – an important trait in today's complex and competitive entrepreneurial landscape [29]. Thirdly, a high level of career self-efficacy also serves as a psychological buffer against career stress and uncertainty. In the post-pandemic era and the 4.0 industrial revolution, many TVET students are exposed to job market uncertainties. However, those who possess strong career self-efficacy are more likely to demonstrate resilience and self-confidence in adapting to an unstable work environment, thereby encouraging them to adopt more effective entrepreneurial strategies [30]. This shows that self-

efficacy is not only important in the early decision-making phase but also throughout the career adjustment process and entrepreneurial growth.

Table 1.
Correlation among Independent Variables.

No.	Variable	Career Self-efficacy	Entrepreneurial competence
1.	Career Self-efficacy	1	0.701**
2.	Educational Qualifications	0.701**	1

5. Discussion

The findings of this study offer a significant contribution to the understanding of how career self-efficacy influences the development of entrepreneurial competence among TVET students, highlighting the importance of psychological resources in fostering not only technical capabilities but also career adaptability. The statistically significant and positive relationship found between career self-efficacy and entrepreneurial competence confirms previous assertions in the literature that self-belief in one’s career capabilities is a key predictor of entrepreneurial behaviour and success [4, 5]. This reinforces the argument that self-efficacy is not merely a psychological trait but a vital enabler of action, resilience, and initiative attributes essential for navigating complex labour markets and volatile economic landscapes.

In addressing the research questions, the study validates the hypothesis that career self-efficacy plays a central role in shaping students' entrepreneurial readiness. These findings align with contemporary theoretical frameworks such as Social Cognitive Career Theory (SCCT), which posits that individuals’ beliefs in their abilities significantly shape their career choices, goals, and performance. The data further confirms that in the context of TVET, self-efficacy development must be seen not as a peripheral component but as a central pillar in producing a resilient, innovative, and entrepreneurial workforce.

Beyond individual development, the implications of these findings extend to curriculum design and policy direction at both national and global levels. In particular, the results support the integration of structured psychosocial interventions, including modules on self-awareness, decision-making, and future orientation, within the core educational framework. Furthermore, pedagogical approaches such as project-based entrepreneurial learning and mentorship from industry professionals provide students with meaningful experiences that reinforce their self-efficacy beliefs through mastery and vicarious learning, as suggested by Bandura’s theory of self-efficacy [4].

These recommendations are strongly aligned with international best practices, especially within European TVET systems that advocate competency-based, student-centred learning approaches. Such systems are designed not only to equip learners with job-specific skills but also to cultivate transversal competencies that are critical for entrepreneurship and lifelong learning in a globalised world. The relevance of this study’s findings thus extends to global education reform efforts that aim to future-proof TVET graduates in light of the Fourth Industrial Revolution and the growing shift toward knowledge-based economies.

Importantly, the study also contributes to a broader international discourse on the repositioning of TVET in a post-pandemic world. With the emergence of hybrid work models, increased automation, and shifting global labour dynamics, TVET institutions are compelled to move beyond traditional paradigms. The findings advocate for a more global outlook in curriculum design, which includes fostering international student mobility, cross-border industrial placements, and digital learning ecosystems. These strategies not only enhance self-efficacy through cross-cultural and real-world exposure but also build the global competence necessary for sustainable employability.

In sum, this study affirms the critical role of career self-efficacy in enhancing entrepreneurial competence among TVET students. It underscores the need for TVET education to adopt a holistic, future-focused approach that integrates psychological development with technical training. By placing student self-development at the core of educational strategies, this study provides a solid empirical foundation for shaping more responsive, inclusive, and globally attuned TVET systems. These insights contribute meaningfully to both the theoretical advancement of career development literature and the practical transformation of vocational education in preparing students for an increasingly uncertain and interconnected world of work.

6. Conclusion

In the global framework, these findings align with the Sustainable Development Goals (SDGs) agenda, particularly SDG 4 and SDG 8, which call for the provision of inclusive, quality technical and vocational education that ensures decent employment opportunities. Therefore, self-efficacy development-based intervention strategies such as project-based entrepreneurship learning, the use of career simulation technology, and industry mentor involvement can be adapted in various TVET systems worldwide. In addition, the challenges of globalisation and the development of disruptive technologies also make self-efficacy an important component in building career resilience and student preparedness to face future economic uncertainties.

Furthermore, in the era of digital transformation and the increasingly challenging gig economy, an individual's ability to build confidence in their potential to plan, manage and adapt to career changes is a critical aspect that can no longer be overlooked. TVET students with a high level of career self-efficacy not only demonstrate courage in taking risks and making impactful entrepreneurial decisions but are also more inclined to explore opportunities in the freelance sector, social entrepreneurship, and technology-based businesses. In line with the national agenda to produce competitive, resilient and future-oriented human capital, investment in shaping students' career self-efficacy should be viewed as a high-impact

development strategy. Continuous policy support, strengthening career guidance programs and active involvement from the industry and entrepreneurial community are among the key components in building an ecosystem that nurtures students' competence, confidence and creativity. In sum, the effort to produce TVET students who are not only technically skilled but also highly entrepreneurial will form the foundation for a sustainable future workforce capable of navigating global uncertainties with agility and vision.

In conclusion, this study affirms the critical role of career self-efficacy in enhancing entrepreneurial competence among TVET students. It underscores the need for TVET education to adopt a holistic, future-focused approach that integrates psychological development with technical training. By placing student self-development at the core of educational strategies, this study provides a solid empirical foundation for shaping more responsive, inclusive, and globally attuned TVET systems. These insights contribute meaningfully to both the theoretical advancement of career development literature and the practical transformation of vocational education in preparing students for an increasingly uncertain and interconnected world of work.

6.1. Recommendations

Based on the findings of this study, several strategic recommendations are proposed to strengthen the development of career self-efficacy as an important element in shaping the entrepreneurial competence of TVET students. These proposals aim to drive curriculum renewal, pedagogical practices, and policy development that are more responsive to the increasingly complex and innovation-driven needs of the current job market.

First, the development of structured psychosocial modules should be prioritized in the TVET curriculum. This module should emphasize aspects of self-building, career awareness, decision-making training, and emotional resilience, delivered through interactive approaches such as scenario-based learning, self-reflection, and group sessions. Interventions like this have high potential in boosting students' confidence in their ability to plan and achieve career and entrepreneurial goals.

Second, the project-based entrepreneurship learning approach needs to be systematically implemented at the institutional level. Through the implementation of real projects under the guidance of industry mentors, students can explore business opportunities, build problem-solving skills, and manage risks in real contexts. This experience not only enhances self-efficacy but also strengthens practical and relevant entrepreneurial skills.

Thirdly, strengthening the role of educators and career counsellors as mentors for student personal development is very important. They not only need to convey career information, but also be equipped with mentoring skills, psychosocial support, and facilitation of students' career growth. Therefore, continuous professional development training must be provided so that educators are prepared to play a more holistic role in the development of students' potential.

Finally, the use of digital technology in career and entrepreneurship guidance practices needs to be expanded. Technologies such as career simulation systems, interest profiling applications, and interactive platforms can be used to provide personalized learning pathways. These methods not only empower students' self-reflection processes but also help them make more confident and informed career decisions.

Overall, all four recommendations emphasize the need for comprehensive reforms in TVET education that not only focus on technical skills but also on the development of human and psychosocial competencies, which are central to the employability and resilience of students in the global career world.

6.2. Limitations

This study makes an important contribution to understanding the role of self-efficacy in shaping entrepreneurial competence among TVET students; however, there are several key limitations that should be considered when interpreting the findings more cautiously. First, this study was conducted within the context of public TVET in Malaysia, which is influenced by the local cultural framework, educational policies, and institutional structures. Therefore, the applicability of the research findings at the international level is limited because the dimensions of self-efficacy and entrepreneurship are heavily influenced by various socioeconomic and cultural environmental factors. This implication poses a challenge for global researchers to adapt the findings of this study within different educational systems and work cultures. Second, the cross-sectional design of the study limits the ability to assess causal effects and the trajectory of changes in self-efficacy throughout the study period or after entering the workforce. In an increasingly uncertain post-pandemic world, understanding how self-efficacy and entrepreneurial capability develop over time is crucial for designing sustainable interventions. Therefore, future studies are highly encouraged to adopt longitudinal approaches or stronger experimental designs, as well as to expand samples to cross-national contexts, in order to ensure that the generalisation and global relevance of the findings can be achieved more comprehensively.

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