

The Role of Digital Technology Competency and Psychological Capital in Vocational Education Students: The Mediating Role of Entrepreneurial Self-Efficacy

Nur Kholifah^{1*}, Muhammad Nurtanto², Farid Mutohhari³, Nuur Wachid Abdul Majid⁴, Moh Fawaid⁵

- ¹ Department of Diploma Fashion Design
Yogyakarta State University, Yogyakarta, 55281, INDONESIA
- ² Department of Mechanical Engineering
Politeknik Negeri Jakarta, West Java, 16424, INDONESIA
- ³ Department of Mechanical Engineering Education
Sarjanawiyata Tamansiswa University, Yogyakarta, 55167, INDONESIA
- ⁴ Department of Information System and Technology Education
Universitas Pendidikan Indonesia, Bandung, 40154, INDONESIA
- ⁵ Department of Mechanical Engineering Vocational Education,
Universitas Sultan Ageng Tirtayasa, Banten, 42163, INDONESIA

*Corresponding Author: nur.kholifah@uny.ac.id
DOI: <https://doi.org/10.30880/jtet.2024.16.03.017>

Article Info

Received: 14th November 2023
Accepted: 5th September 2024
Available online: 23rd December 2024

Keywords

Entrepreneurial intention, entrepreneurial self-efficacy, digital technology competency, psychological capital, vocational education

Abstract

The importance of entrepreneurial intention (EI) in entrepreneurship education, particularly in addressing persistent challenges, demands a more intensive role from vocational education (VE) as a key institution responsible for creating new jobs. Entrepreneurial self-efficacy (ESE) is believed to be the most effective way to strengthen EI. Furthermore, digital technology competence (DTC), supported by psychological capital (PC), plays a crucial role in shaping ESE and EI. This research thoroughly examines the roles of DTC, PC, and ESE in fostering EI among VE students. Additionally, the study investigates the primary role of ESE as a mediator between DTC and PC in determining EI. This research involved 682 VE students who volunteered, meeting specific criteria relevant to the study's needs. Data collection was facilitated through a closed questionnaire using a four-point Likert scale, which was tested for validity and reliability. Structural Equation Modeling (SEM) was employed to analyze the data through path analysis and bootstrap methods. The study confirms the critical importance of ESE in fostering EI among students. It also highlights the significant roles of DTC and PC in enhancing ESE and shaping EI. These findings underscore the need for VE to focus on strengthening these aspects to address the issue of low EI, which in turn affects the creation of new jobs due to the insufficient number of VE graduates pursuing entrepreneurship.

1. Introduction

The relatively fast growth of the labor force is often interpreted as a sign of high economic competitiveness for a country, with the demographic bonus seen as capital for accelerating economic growth. However, the reality is quite different; the increasing labor force has led to significant problems (Sudana et al., 2019). The high number

This is an open access article under the CC BY-NC-SA 4.0 license.



of productive workers is not matched by sufficient employment opportunities (Obidile, 2018; Zhang, 2019). This mismatch is particularly evident in developing countries, where high unemployment rates are a major concern (Boyd, 2012; Kurniawan et al., 2021). Additionally, the decline in the quality of life is another significant consequence, which indirectly hampers economic growth (Adhariani et al., 2019). To address this issue, creating more jobs through encouraging entrepreneurship is a crucial strategy (Jayasuriya & Shand, 1986). Education and training programs focused on human resource development are essential, with vocational education (VE) playing a key role (Agbedahin, 2019; Nurtanto et al., 2020). VE is responsible not only for providing students with work competencies but also for equipping them with entrepreneurship skills to expand employment opportunities (Jaedun et al., 2024; Mahfud et al., 2024).

Despite efforts to provide entrepreneurship skills to VE students, there has been little impact on entrepreneurial growth, especially in developing countries. Research by Hassan et al. (2021) indicates that job creation still lags behind the growing labor force. The long waiting period for high school graduates to find work highlights the ineffectiveness of entrepreneurship education in VE (Spurk, 2021). Studies have shown that low entrepreneurial intention (EI) among students is a significant factor contributing to this issue (Anjum et al., 2021; Sarwar et al., 2021; Sharahiley, 2020; Triyono et al., 2023). For example, research by Saupi et al. (2022) found that students often prefer employment over entrepreneurship due to the lower capital requirements. Furthermore, low student performance in entrepreneurship courses reflects the low EI among students (Santos & Liguori, 2020). Cultivating EI is essential for increasing the effectiveness of entrepreneurship education in VE (Sawang, 2020). EI is closely linked to an individual's determination to pursue a career in entrepreneurship (Fawaid et al., 2022). It is defined as an individual's tendency to engage in entrepreneurial activities by creating new products, seizing business opportunities, and managing risks (Anjum et al., 2021; Ismail et al., 2019). Therefore, fostering EI in VE students through entrepreneurial education is imperative.

However, cultivating EI in VE students is challenging, particularly at the secondary and higher education levels. Research has shown that it is difficult to foster EI among students (Purusottama & Trilaksono, 2019). Furthermore, the motivation and enthusiasm for learning in entrepreneurship courses have remained relatively low, contributing to the lack of EI development (Darmawan et al., 2021). This lack of EI is often attributed to low entrepreneurial self-efficacy (ESE) (Wang & Huang, 2019). ESE is a dominant factor in influencing an individual's tendency and determination to start a business (Neneh, 2020). It serves as an internal trigger that fosters an entrepreneurial mindset, leading to the growth of EI (Santos & Liguori, 2020). ESE also reflects cognitive and psychomotor conditions that influence an individual's capacity, capability, and prospects in entrepreneurship (Bandura, 1995; Sawang, 2020). These aspects are crucial for developing and strengthening EI in VE students (Santos & Liguori, 2020; Wang et al., 2016). Moreover, an individual's psychological state plays a significant role in the emergence of ESE, providing optimism and confidence in their entrepreneurial abilities.

In addition to ESE, other relevant factors are crucial for fostering EI in VE students. First, the current wave of digitalization has significantly influenced the formation of ESE and EI (Sahut et al., 2021). The availability of extensive digital resources can be leveraged by students to support their entrepreneurial processes, thereby constructing ESE (Steyn, 2020). Furthermore, access to comprehensive information through digital technology provides students with a thorough understanding of entrepreneurship, increasing their tendency and determination to pursue it (Oggero et al., 2020). To fully harness digital resources, students must possess digital technology competence (DTC), which encompasses literacy, capacity, capability, and creativity in utilizing digital technology (Astuti et al., 2022; Jatmoko et al., 2023; Mutohhari et al., 2021). Research by Sutiman et al. (2022) provides clear evidence that DTC plays a significant role in enhancing self-efficacy in VE students. Additionally, the tendency to become an entrepreneur is also stimulated by comprehensive DTC (Oggero et al., 2020). The second crucial factor is psychological capital (PC), which several studies have shown to significantly enhance ESE and EI, particularly among VE students (Mahfud, Siswanto, et al., 2020). PC is an ideal psychological state that prepares students to undertake important activities, including work and career development. It reflects a mature state of mind that fosters the intention to engage in specific activities (Li et al., 2019). Therefore, PC is considered a critical factor in influencing the growth of ESE and EI in VE students.

Overall, these findings underscore the importance of cultivating EI as a key factor in job creation. To generate EI, well-developed ESE is essential, and the roles of DTC and PC are crucial in fostering both. ESE is also reported to be a reflection of cognitive, psychomotor, and psychological conditions in individuals, serving as a mediator for DTC and PC in influencing EI. Thus, this study aims to measure the extent of the roles of DTC, PC, and ESE in stimulating the growth of EI. Additionally, it examines the effects of DTC and PC on ESE and explores the mediating role of ESE in the indirect effects of DTC and PC on EI.

1.1 Digital Technology Competence and Psychological Capital on Entrepreneurial Self-Efficacy

Entrepreneurial self-efficacy (ESE) is recognized as a crucial factor in motivating students to develop entrepreneurial intentions (Baum et al., 2007; Sawang, 2020). ESE also provides students with essential skills for

decision-making, planning, executing, and evaluating their entrepreneurial processes (Liu et al., 2019; Wang et al., 2016). Research by Liu et al. (2019) emphasizes that ESE is a fundamental component for achieving entrepreneurial success. ESE is understood as an individual's self-assessment of their ability or competence to run a business, achieve goals, or overcome obstacles (Bandura, 1995). It originates from cognitive reflections built within students, fostering optimism and confidence in their entrepreneurial abilities (Bandura, 1989). ESE is typically measured through three key indicators: level, strength, and generality. Several studies agree that optimism and self-confidence are vital assets in entrepreneurship (Tsai et al., 2016; Wu et al., 2022). Furthermore, research by Mutohhari et al. (2023); Sutiman et al. (2022); Wang et al. (2016) indicates that students' self-assessments of their abilities enhance their confidence in decision-making, particularly in entrepreneurship.

Developing ESE in vocational education students requires several important factors. According to Sawang (2020), the availability of comprehensive information sources significantly influences ESE in students. Such information can be accessed through digital media, highlighting the critical role of digital technology in this process (Akhter et al., 2022). To effectively explore digital information sources, students must possess digital technology competence (DTC) (Primario et al., 2022). Research by Primario et al. (2022); and Elia et al. (2020) shows that higher levels of DTC correlate with increased ESE. DTC encompasses five key components: awareness, literacy, capability, creativity, and critical thinking in using digital technology (Astuti et al., 2022; Pavlova, 2009).

Additionally, Baum et al. (2007) provide valuable insights into the role of psychological capital (PC) in fostering ESE. According to Fuller et al. (2018), PC in entrepreneurship is a psychological state characterized by trust, hope, optimism, resilience, and emotional regulation. These five aspects are essential in balancing social capital and collectively underpin the formation of ESE (Mutohhari et al., 2023). This aligns with studies that demonstrate PC as a critical factor in shaping the level, strength, and generality of students' self-evaluations of their entrepreneurial abilities (Larijani & Saravi-Moghadam, 2018; Mahfud, Siswanto, et al., 2020). Based on the above theories, the hypotheses that are built are as follows:

Hypothesis 1: Digital technology competence plays a significant role in building entrepreneurial self-efficacy.

Hypothesis 2: Psychological capital plays a significant role in building entrepreneurial self-efficacy.

1.2 Digital Technology Competence, Psychological Capital, and Entrepreneurial Self-Efficacy on Entrepreneurial Intentions

Entrepreneurial intention (EI) refers to an individual's mental state that focuses attention and is manifested through concrete actions, leading to entrepreneurial behavior according to plan. EI includes indicators such as desires, preferences, plans, and behavioral expectations related to developing entrepreneurship (Baum et al., 2007). EI is a crucial foundation for developing individuals who are ready for entrepreneurship, both physically and mentally (Anjum et al., 2021). In fact, some studies claim that EI is one of the most important factors in determining individual success in entrepreneurship (Kisubi et al., 2021; Saupi et al., 2022; Wiramihardja et al., 2022). Through vocational education (VE), various efforts have been made to foster EI in students. Critical efforts to increase EI are often related to competence and psychological conditions. Research by Fawaid et al. (2022); Kholifah et al. (2022); Mutohhari et al. (2023) identifies several factors that can foster EI in vocational education students. Among these, three key factors were identified as having the highest significance: psychological dimensions and practical skills that provide access to information.

First, digital technology competence (DTC) is reported to facilitate students in accessing information easily and in depth, which is predicted to stimulate the growth of EI (Mutohhari et al., 2023; Sutiman et al., 2022). Research by Secundo et al. (2021) suggests that a strong inclination and determination to pursue entrepreneurship depend on current understanding and realities, making the breadth and depth of entrepreneurship-related information sources critical. Therefore, the more mature an individual's DTC, the higher their intention to become an entrepreneur (Secundo et al., 2020). Second, since EI is closely linked to psychological conditions, strengthening psychological capital (PC) in students is essential (Mutohhari et al., 2023). PC, which focuses on mental readiness, is believed to enhance students' concentration on entrepreneurship (Yin et al., 2020). Researchers believe that a well-developed PC is crucial, as it serves as an essential mental foundation (Yin et al., 2020; Zhao et al., 2020). Research also confirms that inconsistency and doubt, leading to individual failure in entrepreneurship, often stem from weak mental conditions (Aly et al., 2021). Individuals lacking strong PC are more likely to give up when faced with challenges or failures (Aly et al., 2021; Salisu et al., 2020). Therefore, strengthening PC in students is imperative.

Lastly, entrepreneurial self-efficacy (ESE) is a critical factor that directly stimulates EI (Mutohhari et al., 2023). ESE is reported to be the closest determinant of an individual's intention to become an entrepreneur (Wang & Huang, 2019). The combination of cognitive and psychomotor reflection, balanced with psychological readiness, forms the foundation of strong self-confidence in entrepreneurship (Bandura, 1995; Wang & Huang, 2019). Based on these theoretical studies, the following hypotheses are proposed:

Hypothesis 3: Digital technology competence has a positive and significant effect on the growth of entrepreneurial intentions.

- Hypothesis 4: Psychological capital has a positive and significant effect on the growth of entrepreneurial intentions.
- Hypothesis 5: Entrepreneurial self-efficacy has a positive and significant effect on the growth of entrepreneurial intentions.

1.3 Digital Technology Competence and Psychological Capital on Entrepreneurial Self-Efficacy

The growth of entrepreneurial intention (EI) in students requires stimuli from various systematically constructed aspects. Research by Liu et al. (2019); Wu et al. (2022) has proven that entrepreneurial self-efficacy (ESE) is the most dominant factor in stimulating the growth of EI. However, the development of ESE as the primary driver of EI is contingent upon the prior establishment of digital technology competence (DTC) and psychological capital (PC) in students. Research by Monllor & Soto-Simeone (2020) revealed that competence alone is insufficient to influence intentions. There must be a mediating role of self-efficacy to maximize its impact on intention through indirect influence (Tsai et al., 2016). Similarly, PC requires ESE to mediate its indirect effect on EI. This is further confirmed by previous research, which supports this view (Mutohhari et al., 2023). Based on the theoretical framework described, the following hypotheses are proposed:

- Hypothesis 6: Entrepreneurial self-efficacy has a positive and significant effect in mediating the indirect effect of digital technology competence on entrepreneurial intentions.
- Hypothesis 7: Entrepreneurial self-efficacy has a positive and significant effect in mediating the indirect effect of psychological capital on entrepreneurial intentions.

2. Method

2.1 Research Design

The research focuses on analyzing phenomena or conditions that have already occurred, with relevance to the theoretical framework used to introduce the hypothesis. In this context, an ex-post facto research method was adopted to examine events that have taken place (Cohen et al., 2011). A cross-sectional study approach was employed, with data collected through a structured questionnaire. Based on existing conceptual frameworks and theoretical studies, both direct and mediating effects were measured using actual field data. The analysis examines the role of each aspect or exogenous variable in determining the quality of emotional intelligence (EI) in vocational education (VE) students. The research aligns with the significance of VE in providing entrepreneurship knowledge, advancing digital technology, and fostering students' psychological development, which form the core focus of the study. The collected data were systematically analyzed in two stages: first, by testing the overall hypothesis, and second, by testing it across two classes (used as control variables). The factory teaching class, characterized by production-based or service-based learning with industry-standard qualifications, emphasizes the entrepreneurial process.

2.2 Participant

Research participants were selected based on the criteria of being senior students, specifically those in the third grade (the final year) of vocational education (VE). Only participants who met this criterion were included. To ensure data accuracy, only students who volunteered to participate were selected. For a more comprehensive research overview, students from both regular and teaching factory classes were included, representing three fields of study within VE. Using probabilistic simple random sampling, a sample of 682 students was obtained from private and public schools in Indonesia. Of these participants, fifty-two percent were women, and the remainder were men. The sample represents at least three areas of expertise in vocational education: Technology and Engineering (35%), Information and Communication Technology (38%), and Tourism (26%). The majority of participants (58%) reported living in urban areas, with the remainder residing in rural areas. **Table 1** presents the demographic statistics of the participants involved in this study.

Table 1 Participant demographic statistic

Dimension		Background	Public School N (%)	Private School N (%)
Gender	Male		173 (25.37)	156 (22.87)
	Female		188 (27.57)	165 (24.19)
Areas of expertise	Technology & engineering		123 (18.04)	119 (17.45)
	ICT		139 (20.38)	121 (17.74)
	Tourism		92 (13.49)	88 (12.90)

Dimension	Background	Public School N (%)	Private School N (%)
Residence	Urban	216 (31.67)	180 (26.39)
	Rural	141 (20,67)	145 (21.26)

Notes: N (%) = Number of respondents (in percent)

2.3 Data Collection and Measurement

Data were collected from vocational education (VE) institutions in several major provinces in Indonesia in early 2023. The data collection process involved the distribution of a questionnaire via Google Forms, conducted from early January to late March. The questionnaire utilized a 4-point Likert scale with the following response options: Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD). The instrument was developed by incorporating expert opinions for each variable and included respondent information on key dimensions such as class choice, school status, gender, field of expertise, and domicile. To ensure the validity of the data collection instrument, a previously validated research instrument was adopted, and additional validity tests were conducted to confirm its accuracy. Furthermore, 73 responses were eliminated, as they were completed in less than 6 minutes, which could have compromised the rationality of the data.

2.3.1 Digital Technology Competency Instrument

The 4-item scale for measuring Digital Technology Competency was adapted from Astuti et al. (2022) and Pavlova & Munjanganja (2009). The dimensions for measuring digital technology competency include digital awareness, digital literacy, digital capability, digital creativity, and digital criticism. Digital technology competency refers to the ability to effectively use, manage, understand, and critically evaluate digital resources. Example items include: "I am aware of the benefits of digital technology," "I recognize how digital technology can improve daily tasks," and "I am conscious of the role digital technology plays in modern communication." All items were measured on a 4-point scale, with the Cronbach's Rho (CR) value for this instrument being 0.872.

2.3.2 Psychological Capital Instrument

The 5-item scale for measuring Psychological Capital was adapted from Yi (2013) and Badri & Yunus (2022). The dimensions for measuring psychological capital include self-acceptance, building positive relationships, purpose of life, personal growth, and emotional management. Psychological capital is defined as an individual's positive psychological state characterized by self-efficacy, optimism, hope, and resilience. Example items include: "I accept problems as a part of life that must be faced," "I view challenges as opportunities for personal growth," and "I am at peace with my own imperfections." All items were measured on a 4-point scale, with the Cronbach's Rho (CR) value for this instrument being 0.779.

2.3.3 Entrepreneurial Self-Efficacy Instrument

The 3-item scale for measuring Entrepreneurial Self-Efficacy was adapted from Bandura (1995) and Mutohhari et al. (2023). The dimensions for measuring entrepreneurial self-efficacy include level, strength, and generality. Entrepreneurial self-efficacy refers to the belief in one's ability to successfully perform entrepreneurial tasks. Example items include: "I have self-efficacy for entrepreneurship," "I believe in my ability to start and run a business," and "I am confident in my entrepreneurial decision-making skills." All items were measured on a 4-point scale, with the Cronbach's Rho (CR) value for this instrument being 0.875.

2.3.4 Entrepreneurial Intention Instrument

The 4-item scale for measuring Entrepreneurial Intention was adapted from Arulmani et al. (2014) and Fawaid et al. (2022). The dimensions for measuring entrepreneurial intention include entrepreneurial desire, entrepreneurial plan, behavioral expectation, and entrepreneurial stability. Entrepreneurial intention is defined as an individual's conscious state of mind that directs attention and action toward entrepreneurial activities. Example items include: "I have a desire to achieve through entrepreneurship," "I have a mature plan for entrepreneurship," "I have an expectation of income through entrepreneurship," and "I have a stable intention to become an entrepreneur." All items were measured on a 4-point scale, with the Cronbach's Rho (CR) value for this instrument being 0.832.

2.4 Data Analysis

The research hypothesis is formulated based on relevant theoretical support related to the influence of exogenous variables on endogenous variables, either directly or through mediation, as discussed in the previous literature

review. Structural Equation Modeling (SEM) was used to test the direct effect hypotheses between variables and to explore the mediating roles through path analysis and the bootstrap method. Path analysis measured the direct roles of Digital Technology Competency (DTC), Psychological Capital (PC), and Entrepreneurial Self-Efficacy (ESE) in determining Entrepreneurial Intention (EI) among VE students. Furthermore, the bootstrap method was employed to assess the mediating role of ESE in the relationship between DTC, PC, and EI. Bootstrap was chosen for its accuracy, as it is considered the most reliable method for obtaining confidence intervals for specific indirect effects under most conditions (Preacher & Hayes, 2008). Statistical analysis in this study was conducted using SmartPLS 4.0 software, with variations in the number of iterations to achieve the most accurate results.

3. Results

3.1 Measurement of Validity and Reliability

The reliability and validity tests were conducted using measures provided by SmartPLS (Table 2). Construct reliability was assessed using Cronbach's alpha and composite reliability (CR), while convergent validity was evaluated through the Average Variance Extracted (AVE). Discriminant validity was assessed using the Fornell-Larcker criteria. The results in Table 3 indicate that the four main constructs in this study meet the reliability criteria, with Alpha values ranging from 0.838 to 0.923 and CR values ranging from 0.885 to 0.942, all of which exceed the required threshold of 0.70 (Hair et al., 2021). Additionally, the AVE values range from 0.607 to 0.766, all of which are above the acceptable threshold of 0.50, indicating an acceptable level of convergent validity for all constructs (Henseler et al., 2009). Discriminant validity was further confirmed using the Fornell-Larcker criteria. The Fornell-Larcker criterion is satisfied when the square root of the AVE for each construct is higher than the correlation with other constructs (Fornell & Larcker, 1981).

Table 2 - Construct reliability and validity

Construct	Mean	Standard Deviation	Alpha	CR	AVE
Entrepreneurial intention (EI)	3.442	0.791	0.852	0.900	0.692
Entrepreneurial self-efficacy (ESE)	3.524	0.828	0.842	0.905	0.761
Digital technology competency (DTC)	3.723	1.059	0.838	0.885	0.607
Psychological capital (PC)	3.782	0.906	0.923	0.942	0.766

As shown in Table 3, the square root of the AVE values (numbers in bold) for all main constructs in the model exceeds the corresponding correlations (numbers beneath the bold values), confirming that the Fornell-Larcker criteria have been met and that discriminant validity is achieved.

Table 3 - Correlation and discriminant validity

Construct	1	2	3	4
1. Entrepreneurial self-efficacy (ESE)	0.872			
2. Digital technology competency (DTC)	0.600**	0.779		
3. Psychological capital (PC)	0.691**	0.727**	0.875	
4. Entrepreneurial intention (EI)	0.696**	0.700**	0.684**	0.832
Control variables				
Regular class	0.162*	0.221**	0.126*	0.281**
Teaching factory class	0.149*	0.118*	0.154*	0.111*

Notes: diagonal values in bold represent the square root of the AVE values. * $p < 0.05$ and ** $p < 0.01$

3.2 Structural Equation Model Analysis

The suitability of the proposed model was confirmed through the application of the Common Method Variance (CMV) test, using Harman's one-factor test. Factor analysis was conducted on all items used to measure exogenous, mediating, and endogenous variables, resulting in the extraction of three factors with an Eigenvalue greater than one. The first factor (Eigenvalue = 4.261) accounted for 38.96% of the variance. Since the items did not load onto a single factor and the first factor explained less than 50% of the variance, CMV was not considered an issue in this study. To further validate that CMV was not a concern, a full collinearity test was performed using SmartPLS software. The full collinearity approach, as proposed by Kock & Lynn (2012), involved creating a block where all latent variables in the model were included as predictors for a single criterion. This criterion was represented by a latent factor with a single indicator, generated using randomly produced values. The model was

then run using partial least squares structural equation modeling (PLS-SEM) through SmartPLS software, and the variance inflation factor (VIF) values were examined to assess the presence of CMV. According to Kock & Lynn (2012), any VIF value above 3.3 would indicate a potential CMV issue. The test results showed VIF values as follows: 1.83 for DTC, 1.68 for PC, 1.92 for ESE, and 2.04 for EI. Since none of the VIF values exceeded 3.3, it was concluded that the proposed model was not affected by CMV.

The model's fit was evaluated to assess its adequacy and identify any necessary adjustments to the structural model designed based on the theoretical framework. The overall fit indices of the research model, as presented in Table 5, indicate that all indices for the main model yielded satisfactory results. The chi-square value was 22.501, indicating a relatively low critical value. The probability value of 0.348 demonstrated significance at a high level (>0.050). The Goodness of Fit Index (GFI) was recorded at 0.901, the Adjusted Goodness of Fit Index (AGFI) at 0.922, the Comparative Fit Index (CFI) at 0.901, and the Normed Fit Index (NFI) at 0.903—each exceeding the threshold of ≥ 0.90 . Additionally, the Standardized Root Mean Square Residual (SRMR) was 0.029 (<0.050), and the Root Mean Square Error of Approximation (RMSEA) was below 0.08. These results suggest that the model meets the Goodness of Fit criteria, supporting further structural model analysis (Johnson & Wichern, 2007).

3.3 Measurement of Direct Effect

We systematically tested the hypotheses based on the previously established theoretical framework. The hypothesis testing, which examines the direct effects, was conducted using path analysis. This analysis is based on the estimated correlation values, t-statistics, and p-values, with a significance level set at 5%. Additionally, the analysis provides a confidence interval of 97.5% (CI 97.5%) and an error rate of 2.5%. The hypothesis testing specifically measured the direct effects of Digital Technology Competency (DTC) and Psychological Capital (PC) on Entrepreneurial Self-Efficacy (ESE), as well as the direct effects of DTC, PC, and ESE on Entrepreneurial Intention (EI). The tests were conducted using both the entire sample and samples grouped by regular and teaching factory classes. Testing by class aimed to determine whether the hypotheses hold true across all respondents, regardless of the class type. This consideration is based on reports that VE students in the teaching factory classes tend to have better EI compared to other classes, given their more intensive exposure to the world of work (Arulmani et al., 2014).

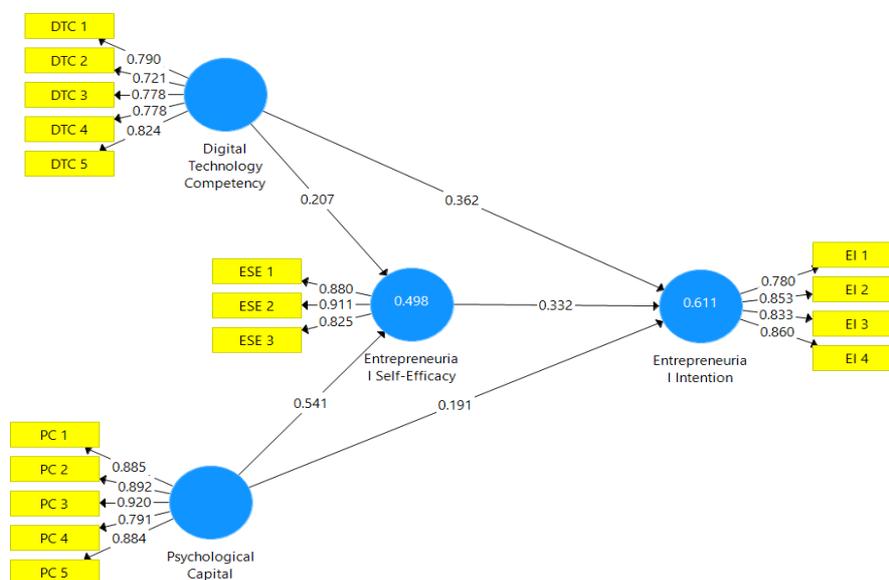


Fig.1 SEM analysis results of the proposed model

Based on the Structural Equation Modeling (SEM) analysis presented in **Fig. 1**, there are significant relationships between Digital Technology Competency (DTC), Psychological Capital (PC), Entrepreneurial Self-Efficacy (ESE), and Entrepreneurial Intention (EI) among vocational education (VE) students. The results show that both DTC and PC have a positive and significant impact on ESE, with path coefficients of 0.207 ($p = 0.006$) and 0.541 ($p < 0.001$), respectively. Additionally, DTC and PC directly influence EI, with path coefficients of 0.362 ($p < 0.001$) and 0.191 ($p = 0.022$). ESE also significantly predicts EI, with a path coefficient of 0.332 ($p < 0.001$), indicating that students with higher self-efficacy are more likely to engage in entrepreneurial activities. Overall, DTC, PC, and ESE play crucial roles in shaping the entrepreneurial intentions of VE students, with ESE serving as an essential mediator in these relationships. **Table 4** below presents the results of hypothesis testing using path analysis with both the intact sample and the samples from each class.

Table 4 Path analysis result

Hypothesis	Path Analysis	Estimated correlation	t-Value	SE	p	Decision
Hypothesis 1	DTC → ESE	0.207	2.039	0.002	0.006*	Accepted
Hypothesis 2	PC → ESE	0.541	3.130	0.000	0.000**	Accepted
Hypothesis 3	DTC → EI	0.362	5.371	0.001	0.000**	Accepted
Hypothesis 4	PC → EI	0.191	2.298	0.002	0.022*	Accepted
Hypothesis 5	ESE → EI	0.332	3.342	0.002	0.000**	Accepted

Notes: Level of significance: * $p < 0.05$ and ** $p < 0.01$.

3.4 The Effect of ESE Mediation

The research focused on assessing the mediating role of Entrepreneurial Self-Efficacy (ESE) between Digital Technology Competency (DTC) and Psychological Capital (PC) in determining Entrepreneurial Intention (EI) among vocational education students. The analysis utilized the bootstrap method, known for its reliability in obtaining confidence intervals for indirect effects, to test the significance of ESE's mediating role. Table 6 presents the results of this analysis, showing that ESE significantly mediates the relationship between DTC and PC with EI. Specifically, the table indicates that the direct effect of DTC on EI is significant (0.541, $p < 0.01$), and when ESE is included as a mediator, both the indirect effect (0.146, $p < 0.05$) and the total effect (0.687, $p < 0.01$) are also significant. Similarly, the direct effect of PC on EI (0.191, $p < 0.05$) is complemented by a significant indirect effect through ESE (0.244, $p < 0.01$), resulting in a significant total effect (0.435, $p < 0.01$). These findings confirm that the two hypotheses regarding ESE's mediating role (Hypotheses 6 and 7) are accepted (see Table 5). The results highlight that ESE plays a crucial role in amplifying the influence of DTC and PC on EI.

Table 5- The mediating role of entrepreneurial self-efficacy (ESE)

Hypothesis and Path Analysis	Direct Effect		Indirect Effect		Total Effect		Decision
	Estimated	p	Estimated	p	Estimated	p	
Hypothesis 6 (DTC → ESE → EI)	0.541	0.000**	0.146	0.021*	0.687	0.000**	Accepted
Hypothesis 7 (PC → ESE → EI)	0.191	0.022*	0.244	0.000**	0.435	0.000***	Accepted

Notes: Level of significance: * $p < 0.05$ and ** $p < 0.01$.

4. Discussion

Vocational education (VE) has traditionally focused on preparing graduates to be either ready for work or to become entrepreneurs. While this is a valuable goal, it is crucial to investigate how VE graduates can not only be prepared for entrepreneurship but also be assured of their ability to realize it. Beyond mere readiness for entrepreneurship, there is a need for a focus on the actual realization of entrepreneurial ventures. VE must recognize the importance of cultivating entrepreneurial intentions (EI) within students and equipping them with technical skills (Handayati et al., 2020). EI has been a relevant issue from the past to the present, serving as a critical foundation for individuals to concentrate their efforts and pursue entrepreneurial actions (Saupi et al., 2022). Individuals with strong EI exhibit resilience, enabling them to overcome risks and obstacles in entrepreneurship without being discouraged from continuing their efforts (Roy & Das, 2020). This resilience is recognized as a key factor in achieving entrepreneurial success (Mutohhari et al., 2023; Sawang, 2020). Therefore, developing effective VE strategies requires careful consideration of innovative approaches to enhance EI in students.

One promising approach is to strengthen entrepreneurial self-efficacy (ESE), which appears to be a crucial factor that VE can focus on to increase EI in students. This research confirms that ESE is essential in both learning and work environments, demonstrating significant contributions in regular classes and teaching factories. The findings provide strong evidence that ESE plays a pivotal role in fostering and enhancing EI, aligning with previous studies that have reported similar results. ESE serves as an internal factor that triggers an entrepreneurial mindset, thereby promoting the growth of EI (Santos & Liguori, 2020; Sutiman et al., 2022). ESE also reflects cognitive and psychomotor conditions, representing changes in individuals' capacity, capability, and entrepreneurial prospects (Bandura, 1995; Sawang, 2020). These aspects of ESE are critical for fostering and strengthening EI in VE students (Santos & Liguori, 2020; Wang et al., 2016). Furthermore, an individual's psychological state contributes to the emergence of ESE, providing optimism and confidence in their entrepreneurial abilities (Mahfud, Siswanto, et al., 2020).

There are specific reasons why the growth of ESE is essential for strengthening EI in VE students. The study's findings suggest that support from digital technology competence (DTC) significantly contributes to the development of both ESE and EI. The widespread impact of digitalization across all fields of activity is a fundamental reason for this (Sahut et al., 2021). The broad availability of digital resources allows students to leverage them in their entrepreneurial processes, thereby constructing ESE (Steyn, 2020). Moreover, access to comprehensive information through digital technology provides students with a clearer understanding of entrepreneurship, increasing their entrepreneurial tendencies and determination (Oggero et al., 2020). Therefore, DTC plays a vital role in achieving the ideal levels of ESE and EI necessary for successful entrepreneurship (Drummond et al., 2020). Research by Sutiman et al. (2022) supports the idea that DTC significantly enhances self-efficacy in VE students. On the other hand, the development of ESE and EI requires a balance between technical and psychological aspects. Psychological capital (PC) serves as an essential complement to technical competence (Baum et al., 2007). PC encompasses self-acceptance, building positive relationships, life goals, personal growth, and emotional management. These five aspects within the individual stimulate confidence and foster the intention to pursue activities of interest, including entrepreneurship (Ephrem et al., 2019). Similar research has even identified PC as a primary factor in the development of EI (Mahfud, Triyono, et al., 2020).

This study also demonstrates that ESE is a significant mediator in the relationship between DTC, PC, and EI. The growth of EI in students requires stimuli from various systematically constructed aspects. According to Liu et al. (2019); Wu et al. (2022), ESE is the most dominant factor in stimulating EI. However, the development of ESE as a primary trigger for EI growth depends on the foundation of DTC and PC previously established in students. Research by Monllor & Soto-Simeone (2020) indicates that competence alone is insufficient for influencing intentions; the mediating role of self-efficacy is required to maximize its impact on intention through indirect influence (Tsai et al., 2016). Similarly, PC also requires the mediating role of ESE to influence EI indirectly, a finding confirmed by previous studies (Mutohhari et al., 2023).

This research further clarifies the conditions and learning environment that VE must prepare to foster EI in students. Access to digital technology should be leveraged to broaden students' perspectives and creativity in building their career and entrepreneurial intentions. Awareness of digital technology's role in accessing the world of work is crucial to establish first. This awareness will shape digital literacy and capability, leading to creativity and critical thinking in using digital technology, thereby strongly fostering EI and ESE (Mutohhari et al., 2023; Pavlova, 2009). Additionally, VE should recognize the importance of strengthening PC in students alongside technical competence. Through its programs, VE should aim to balance the provision of technical competence with the development of psychological capital for entrepreneurship. This research also opens up new avenues for future studies in various areas. Efforts to strengthen DTC, PC, ESE, and EI present long-term opportunities for VE researchers to explore, aligning with global goals such as those outlined in the Sustainable Development Goals (SDGs), which emphasize the importance of developing and encouraging entrepreneurship.

5. Conclusion

This research highlights the critical direction that vocational education (VE) must take to equip students with a strong foundation in entrepreneurship. Entrepreneurial intentions (EI) should be the primary focus in entrepreneurship education within VE. The learning conditions and environment that VE provides must prioritize the growth of EI in its students. Facilitating easier access to digital technology is essential for broadening students' perspectives and fostering creativity in shaping their career and entrepreneurial intentions. In this context, strengthening digital technology competency (DTC) is a crucial initial step. Awareness and literacy are the foundational aspects of DTC that must be developed, leading to increased creativity and critical thinking in using digital technology. As demonstrated in this study, this approach significantly enhances the growth of both EI and entrepreneurial self-efficacy (ESE). Moreover, VE should not solely focus on equipping students with work competencies; it must also recognize the importance of strengthening psychological capital (PC) in students. Through its programs, VE should strive to achieve an ideal balance between technical competence and psychological capital, both of which are essential for fostering entrepreneurship. This research also opens up new avenues for future studies. The efforts to strengthen DTC, PC, ESE, and EI represent long-term opportunities for VE researchers to explore, aligning with global objectives such as those outlined in the Sustainable Development Goals (SDGs), which emphasize the importance of developing and encouraging entrepreneurship.

Acknowledgement

The first author would like to express his deepest gratitude to the principal, teachers, and students in vocational education in Indonesia who helped fill out the instrument. The results of the analysis are highly valuable in assisting students' decision-making when choosing an entrepreneurial career path.

Conflict of Interest

Authors declare that there is no conflict of interests regarding the publication of the paper.

Author Contribution

The authors confirm contribution to the paper as follows: **study conception and design:** Nur Kholifah, Muhammad Nurtanto; **data collection:** Farid Mutohhari, Moh Fawaid; **analysis and interpretation of results:** Muhammad Nurtanto, Nur Kholifah, Nuur Wachid Abdul Majid; **draft manuscript preparation:** Muhammad Nurtanto, Farid Mutohhari, Nuur Wachid Abdul Majid, Moh Fawaid. All authors reviewed the results and approved the final version of the manuscript.

References

- Adhariani, D., Siregar, S. V., & Yulius, R. (2019). Borderless with unequal opportunity? experts' perspectives on the asean economic community and impact on indonesian accountant profession. *Qualitative Report, 24*(5), 1147–1167. <https://doi.org/10.46743/2160-3715/2019.3940>
- Agbedahin, A. V. (2019). Sustainable development, Education for Sustainable Development, and the 2030 Agenda for Sustainable Development: Emergence, efficacy, eminence, and future. *Sustainable Development, 27*(4), 669–680. <https://doi.org/10.1002/sd.1931>
- Akhter, A., Anwarul Islam, K. M., Karim, M. M., & Bin Latif, W. (2022). Examining determinants of digital entrepreneurial intention: A case of graduate students. *Problems and Perspectives in Management, 20*(3), 1–14. [https://doi.org/10.21511/ppm.20\(3\).2022.13](https://doi.org/10.21511/ppm.20(3).2022.13)
- Aly, M., Audretsch, D. B., & Grimm, H. (2021). Emotional skills for entrepreneurial success: the promise of entrepreneurship education and policy. *Journal of Technology Transfer, 46*(5), 1–19. <https://doi.org/10.1007/s10961-021-09866-1>
- Anjum, T., Farrukh, M., Heidler, P., & Tautiva, J. A. D. (2021). Entrepreneurial intention: Creativity, entrepreneurship, and university support. *Journal of Open Innovation: Technology, Market, and Complexity, 7*(1), 1–13. <https://doi.org/10.3390/joitmc7010011>
- Arulmani, G., Bakshi, A., Leong, F., & Watts, A. (2014). *Handbook of Career Development: International Perspectives*. Springer Science and Business Media.
- Astuti, M., Arifin, Z., Nurtanto, M., Mutohhari, F., & Warju, W. (2022). The maturity levels of the digital technology competence in vocational education. *International Journal of Evaluation and Research in Education, 11*(2), 596–603. <https://doi.org/10.11591/ijere.v11i2.22258>
- Badri, Z., Khadijah, S., Yunus, W. M., & Azam, W. M. (2022). The relationship between academic vs. family/personal role conflict and Malaysian students' psychological wellbeing during COVID-19 lockdown. *Journal of Further and Higher Education, 46*(1), 76–88. <https://doi.org/10.1080/0309877X.2021.1884210>
- Bandura, A. (1989). Human agency in social cognitive theory. *American Psychologist, 44*(9). <https://doi.org/10.1037//0003-066x.44.9.1175>
- Bandura, A. (1995). *Self-Efficacy in Changing Societies*. Cambridge University Press.
- Baum, J. R., Frese, M., & Baron, R. A. (2007). *The Psychology of Entrepreneurship*. Psychology Press.
- Boyd, R. L. (2012). Race, Self-Employment, and Labor Absorption. *American Journal of Economics and Sociology, 71*(3), 639–661. <https://doi.org/10.1111/j.1536-7150.2012.00825.x>
- Cohen, L., Lawrence, M., & Keith, M. (2011). *Research methods in education*. Routledge:Taylor & Francis Group.
- Darmawan, I., Soetjipto, B. E., Djatmika, E. T., & Wahyono, H. (2021). The development of the entrepreneurship learning design based on caring economics to enhance spirit of entrepreneurship and entrepreneurial intentions. *Humanities and Social Sciences Letters, 9*(1), 1–13. <https://doi.org/10.18488/JOURNAL.73.2021.91.1.13>
- Drummond, C., O'Toole, T., & McGrath, H. (2020). Digital engagement strategies and tactics in social media marketing. *European Journal of Marketing, 54*(6), 1247–1280. <https://doi.org/10.1108/EJM-02-2019-0183>
- Elia, G., Margherita, A., & Passiante, G. (2020). Digital entrepreneurship ecosystem: How digital technologies and collective intelligence are reshaping the entrepreneurial process. *Technological Forecasting and Social Change, 150*(1), 1–12. <https://doi.org/10.1016/j.techfore.2019.119791>
- Ephrem, A. N., Namatovu, R., & Basalirwa, E. M. (2019). Perceived social norms, psychological capital and entrepreneurial intention among undergraduate students in Bukavu. *Education and Training, 61*(7–8), 963–983. <https://doi.org/10.1108/ET-10-2018-0212>
- Fawaid, M., Triyono, M. B., Sofyan, H., Mutohhari, F., Jatmoko, D., Wachid, N., Majid, A., & Rabiman, R. (2022). Entrepreneurial Intentions of Vocational Education Students in Indonesia : PLS-SEM Approach. *Journal of Technical Education and Training, 14*(2), 91–105. <https://doi.org/https://doi.org/10.30880/jtet.2022.14.02.009>
- Fornell, C., & Larcker, D. F. (1981). Evaluating Structural Equation Models with Unobservable Variables and

- Measurement Error. *Journal of Marketing Research*, 18(1), 39–50.
<https://doi.org/10.1177/002224378101800104>
- Fuller, B., Liu, Y., Bajaba, S., Marler, L. E., & Pratt, J. (2018). Examining how the personality, self-efficacy, and anticipatory cognitions of potential entrepreneurs shape their entrepreneurial intentions. *Personality and Individual Differences*, 125(1), 120–125. <https://doi.org/10.1016/j.paid.2018.01.005>
- Hair Jr, J. F., Ringle, C. M., Hult, G. T. M., Danks, N. P., Sarstedt, M., & Ray, S. (2021). *Partial Least Squares Structural Equation Modeling (PLS-SEM) Using R*. Springer Nature Switzerland AG.
- Handayati, P., Wulandari, D., Soetjipto, B. E., Wibowo, A., & Narmaditya, B. S. (2020). Does entrepreneurship education promote vocational students' entrepreneurial mindset? *Heliyon*, 6(11), 1–12.
<https://doi.org/10.1016/j.heliyon.2020.e05426>
- Hassan, P. F., Noor, M. S. M., & Mohammad, H. (2021). Challenges in education and training to develop malaysian construction workforce. *International Journal of Sustainable Construction Engineering and Technology*, 12(2), 53–69. <https://doi.org/10.30880/ijscet.2021.12.02.005>
- Henseler, J., Ringle, C. M., & Sinkovics, R. R. (2009). The use of partial least squares path modeling in international marketing. *Advances in International Marketing*, 20(1), 277–319.
[https://doi.org/10.1108/S1474-7979\(2009\)0000020014](https://doi.org/10.1108/S1474-7979(2009)0000020014)
- Ismail, A., Adnan, W. N., Masek, A., Hassan, R., Hashim, S., & Ismail, M. E. (2019). Effectiveness of entrepreneurship programmes in developing entrepreneurship skills towards quality TVET graduates. *Journal of Technical Education and Training*, 11(1), 81–86. <https://doi.org/10.30880/jtet.2019.11.01.10>
- Jaedun, A., Nurtanto, M., Mutohhari, F., Saputro, I. N., & Kholifah, N. (2024). Perceptions of vocational school students and teachers on the development of interpersonal skills towards Industry 5.0. *Cogent Education*, 11(1). <https://doi.org/10.1080/2331186X.2024.2375184>
- Jatmoko, D., Suyitno, S., Rasul, M. S., Nurtanto, M., Kholifah, N., Masek, A., & Nur, H. R. (2023). The Factors Influencing Digital Literacy Practice in Vocational Education: A Structural Equation Modeling Approach. *European Journal of Educational Research*, 12(2), 1109–1121. <https://doi.org/10.12973/eu-jer.12.2.1109>
- Jayasuriya, S. K., & Shand, R. T. (1986). Technical change and labor absorption in Asian agriculture: Some emerging trends. *World Development*, 14(3), 415–428. [https://doi.org/10.1016/0305-750X\(86\)90079-3](https://doi.org/10.1016/0305-750X(86)90079-3)
- Johnson, R. A., & Wichern, D. W. (2007). *Applied multivariate statistical analysis* (6th ed.). Pearson Education, Inc.
- Kergroach, S. (2017). Industry 4.0: New challenges and opportunities for the labour market. *Foresight and STI Governance*, 11(4), 6–8. <https://doi.org/10.17323/2500-2597.2017.4.6.8>
- Kholifah, N., Kusumawaty, I., Nurtanto, M., Mutohhari, F., Isnantyo, F. D., & Subakti, H. (2022). Designing The Structural Model of Students' Entrepreneurial Personality in Vocational Education: An Empirical Study in Indonesia. *Journal of Technical Education and Training*, 14(3), 1–17.
<https://doi.org/10.30880/jtet.2022.14.03.001>
- Kisubi, M. K., Bonuke, R., & Korir, M. (2021). Entrepreneurship education and self-employment intentions: A conditional effect of entrepreneurial self-efficacy evidence from a developing country. *Cogent Business and Management*, 8(1), 1–14. <https://doi.org/10.1080/23311975.2021.1938348>
- Kock, N., & Lynn, G. S. (2012). Lateral collinearity and misleading results in variance-based SEM: An illustration and recommendations. *Journal of the Association for Information Systems*, 13(7), 546–580.
<https://doi.org/10.17705/1jais.00302>
- Kurniawan, R., Jaedun, A., Mutohhari, F., & Kusuma, W. M. (2021). The Absorption of Vocational Education Graduates in The Automotive Sector in The Industrial World. *Journal of Education Technology*, 5(3).
<https://doi.org/10.23887/jet.v5i3.35365>
- Larijani, F., & Saravi-Moghadam, N. (2018). The effects of positive organisational behaviour on entrepreneurial personality and innovation. *International Journal of Productivity and Quality Management*, 23(2), 247–272.
<https://doi.org/10.1504/IJPQM.2018.089158>
- Li, H., Ngo, H. yue, & Cheung, F. (2019). Linking protean career orientation and career decidedness: The mediating role of career decision self-efficacy. *Journal of Vocational Behavior*, 115(04), 1–37.
<https://doi.org/10.1016/j.jvb.2019.103322>
- Liu, X., Lin, C., Zhao, G., & Zhao, D. (2019). Research on the effects of entrepreneurial education and entrepreneurial self-efficacy on college students' entrepreneurial intention. *Frontiers in Psychology*, 10(APR), 869. <https://doi.org/10.3389/FPSYG.2019.00869/BIBTEX>
- Mahfud, T., Hidayat, R. A., Thaib, D., Kholifah, N., & Sari, A. I. (2024). Let's to be an Entrepreneur through Education! The Role of Entrepreneurial Attitude Orientation and Psychological Capital among University Students. *Global Business and Finance Review*, 29(8), 91–106. <https://doi.org/10.17549/gbfr.2024.29.8.91>
- Mahfud, T., Siswanto, I., Wijayanto, D. S., & Puspitasari, P. F. (2020). Antecedent factors of vocational high school students' readiness for selecting careers: A case in Indonesia. *Cakrawala Pendidikan*, 39(3), 633–644.
<https://doi.org/10.21831/cp.v39i3.32310>
- Mahfud, T., Triyono, M. B., Sudira, P., & Mulyani, Y. (2020). The influence of social capital and entrepreneurial attitude orientation on entrepreneurial intentions: the mediating role of psychological capital. *European*

- Research on Management and Business Economics*, 26(1), 33–39.
<https://doi.org/10.1016/j.iemeen.2019.12.005>
- Monllor, J., & Soto-Simeone, A. (2020). The impact that exposure to digital fabrication technology has on student entrepreneurial intentions. *International Journal of Entrepreneurial Behaviour and Research*, 26(7), 1505–1523. <https://doi.org/10.1108/IJEBR-04-2019-0201>
- Mutohhari, F., Sutiman, S., Nurtanto, M., Kholifah, N., & Samsudin, A. (2021). Difficulties in implementing 21st century skills competence in vocational education learning. *International Journal of Evaluation and Research in Education*, 10(4), 1229–1236. <https://doi.org/10.11591/ijere.v10i4.22028>
- Mutohhari, F., Triyono, M. B., Sudira, P., Nurtanto, M., & Kholifah, N. (2023). The Role of Entrepreneurial Personality Mediation and Technological Competencies Moderation in Determining Entrepreneurial Intentions in Vocational Education. *Journal of Technical Education and Training*, 15(1), 128–141. <https://doi.org/10.30880/jtet.2023.15.01.012>
- Neneh, B. N. (2020). Entrepreneurial passion and entrepreneurial intention: the role of social support and entrepreneurial self-efficacy. *Studies in Higher Education*, 8(1), 1–18. <https://doi.org/10.1080/03075079.2020.1770716>
- Nurtanto, M., Fawaid, M., & Sofyan, H. (2020). Problem Based Learning (PBL) in Industry 4.0: Improving Learning Quality through Character-Based Literacy Learning and Life Career Skill (LL-LCS). *Journal of Physics: Conference Series*, 1573(1). <https://doi.org/10.1088/1742-6596/1573/1/012006>
- Obidile, J. I. (2018). Revitalization of the Technical and Vocational Education (TVE) Programmes for Youth Empowerment in Nigeria. *International Journal of Vocational Education and Training Research*, 4(1), 45. <https://doi.org/10.11648/j.ijvetr.20180401.17>
- Oggero, N., Rossi, M. C., & Ughetto, E. (2020). Entrepreneurial spirits in women and men. The role of financial literacy and digital skills. *Small Business Economics*, 55(2), 313–327. <https://doi.org/10.1007/s11187-019-00299-7>
- Pavlova, M. (2009). Technology and vocational education for sustainable development. In *Technology and Vocational Education for Sustainable Development*. Springer Science Business Media B.V. <https://doi.org/10.1007/978-1-4020-5279-8>
- Pavlova, M., & Munjanganja, L. E. (2009). Changing Workplace Requirements: Implication for Education. In *International Handbook of Education for the Changing World of Work*. Springer.
- Primario, S., Rippa, P., & Secundo, G. (2022). Rethinking entrepreneurial education: The role of digital technologies to assess entrepreneurial self-efficacy and intention of STEM students. *IEEE Transactions on Engineering Management*, 62(1), 1–11. <https://doi.org/10.1109/TEM.2022.3199709>
- Purusottama, A., & Trilaksono, T. (2019). The presence and persistence of entrepreneurship education in indonesia: A cross sectional study. *International Journal of Evaluation and Research in Education*, 8(1), 71–80. <https://doi.org/10.11591/ijere.v8i1.16528>
- Roy, R., & Das, N. (2020). A critical comparison of factors affecting science and technology students' entrepreneurial intention: a tale of two genders. *International Journal for Educational and Vocational Guidance*, 20(1), 49–77. <https://doi.org/10.1007/s10775-019-09393-4>
- Sahut, J. M., Iandoli, L., & Teulon, F. (2021). The age of digital entrepreneurship. *Small Business Economics*, 56(3), 1159–1169. <https://doi.org/10.1007/s11187-019-00260-8>
- Salisu, I., Hashim, N., Mashi, M. S., & Aliyu, H. G. (2020). Perseverance of effort and consistency of interest for entrepreneurial career success: Does resilience matter? *Journal of Entrepreneurship in Emerging Economies*, 12(2), 279–304. <https://doi.org/10.1108/JEEE-02-2019-0025>
- Santos, S. C., & Liguori, E. W. (2020). Entrepreneurial self-efficacy and intentions: Outcome expectations as mediator and subjective norms as moderator. *International Journal of Entrepreneurial Behaviour and Research*, 26(3), 400–415. <https://doi.org/10.1108/IJEBR-07-2019-0436>
- Sarwar, A., Ahsan, Q., & Rafiq, N. (2021). Female Entrepreneurial Intentions in Pakistan: A Theory of Planned Behavior Perspective. *Frontiers in Psychology*, 12(1), 1–14. <https://doi.org/10.3389/fpsyg.2021.553963>
- Saupi, S. H. N. A. B. M., Jambari, H., Noh, N. H., Pairan, M. R., Ahyar, N. A. M., Ismail, N., & Taman, I. (2022). Entrepreneurial behaviours of final year students at vocational colleges toward interest in entrepreneurship. *International Journal of Business and Globalisation*, 30(3–4), 415–428. <https://doi.org/10.1504/IJBG.2022.123618>
- Sawang, S. (2020). *Entrepreneurship Education: A Lifelong Learning Approach* (1st ed.). Springer.
- Secundo, G., Mele, G., Vecchio, P. Del, Elia, G., Margherita, A., & Ndou, V. (2021). Threat or opportunity? A case study of digital-enabled redesign of entrepreneurship education in the Covid-19 emergency. *Technological Forecasting and Social Change*, 166(18), 1–13. <https://doi.org/10.1016/j.techfore.2020.120565>
- Secundo, G., Rippa, P., & Meoli, M. (2020). Digital transformation in entrepreneurship education centres: preliminary evidence from the Italian Contamination Labs network. *International Journal of Entrepreneurial Behaviour and Research*, 26(7), 1589–1605. <https://doi.org/10.1108/IJEBR-11-2019-0618>
- Sharahiley, S. M. (2020). Examining Entrepreneurial Intention of the Saudi Arabia's University Students:

- Analyzing Alternative Integrated Research Model of TPB and EEM. *Global Journal of Flexible Systems Management*, 21(1), 67–84. <https://doi.org/10.1007/s40171-019-00231-8>
- Spurk, D. (2021). Vocational behavior research: Past topics and future trends and challenges. *Journal of Vocational Behavior*, 126(April), 1–8. <https://doi.org/10.1016/j.jvb.2021.103559>
- Steyn, R. A. (2020). Changing thoughts towards digital literacy interventions for South African entrepreneurs. *Reading and Writing (South Africa)*, 9(1), 1–9. <https://doi.org/10.4102/RW.V9I1.172>
- Sudana, I. M., Apriyani, D., & Nurmasitah, S. (2019). Revitalization of vocational high school roadmap to encounter the 4.0 industrial revolution. *Journal of Social Sciences Research*, 5(2), 338–342. <https://doi.org/10.32861/jssr.52.338.342>
- Sutiman, S., Sofyan, H., Soenarto, S., Mutohhar, F., & Nurtanto, M. (2022). Students' career decision-making during online learning: The mediating roles of self-efficacy in vocational education. *European Journal of Educational Research*, 11(3), 1669–1682. <https://doi.org/10.12973/eu-jer.11.3.1669>
- Triyono, M. B., Mutohhar, F., Kholifah, N., Nurtanto, M., Subakti, H., & Prasetya, K. H. (2023). Examining the Mediating-Moderating Role of Entrepreneurial Orientation and Digital Competence on Entrepreneurial Intention in Vocational Education. *Journal of Technical Education and Training*, 15(1), 116–127. <https://doi.org/10.30880/jtet.2023.15.01.011>
- Tsai, K. H., Chang, H. C., & Peng, C. Y. (2016). Extending the link between entrepreneurial self-efficacy and intention: a moderated mediation model. *International Entrepreneurship and Management Journal*, 12(2), 445–463. <https://doi.org/10.1007/s11365-014-0351-2>
- Wang, J. H., Chang, C. C., Yao, S. N., & Liang, C. (2016). The contribution of self-efficacy to the relationship between personality traits and entrepreneurial intention. *Higher Education*, 72(2), 209–224. <https://doi.org/10.1007/s10734-015-9946-y>
- Wang, L. Y., & Huang, J. H. (2019). Effect of entrepreneurial self-efficacy on the entrepreneurial intentions of students at a university in Hainan province in China: Taking social support as a moderator. *International Journal of Learning, Teaching and Educational Research*, 18(9), 1–12. <https://doi.org/10.26803/ijlter.18.9.10>
- Wiramihardja, K., N'dary, V., Al Mamun, A., Munikrishnan, U. T., Yang, Q., Salamah, A. A., & Hayat, N. (2022). Sustainable economic development through entrepreneurship: A study on attitude, opportunity recognition, and entrepreneurial intention among university students in Malaysia. *Frontiers in Psychology*, 13(1), 1–14. <https://doi.org/10.3389/fpsyg.2022.866753>
- Wu, L., Jiang, S., Wang, X., Yu, L., Wang, Y., & Pan, H. (2022). Entrepreneurship education and entrepreneurial intentions of college students: The mediating role of entrepreneurial self-efficacy and the moderating role of entrepreneurial competition experience. *Frontiers in Psychology*, 12(1), 1–16. <https://doi.org/10.3389/fpsyg.2021.727826>
- Yi, C.-C. (2013). *The Psychological Well-being of East Asian Youth*. Springer Science + Business Media.
- Yin, Y., Yang, L., & Liu, B. (2020). Analysis on entrepreneurship psychology of preschool education students with entrepreneurial intention. *Frontiers in Psychology*, 11(1), 1–15. <https://doi.org/10.3389/fpsyg.2020.01559>
- Zhang, X. (2019). A study on the rural revitalization function of vocational education. *Lifelong Education*, 8(2), 1–16. <https://doi.org/10.18282/le.v8i2.779>
- Zhao, J., Wei, G., Chen, K. H., & Yien, J. M. (2020). Psychological Capital and University Students' Entrepreneurial Intention in China: Mediation Effect of Entrepreneurial Capitals. *Frontiers in Psychology*, 10(1), 1–11. <https://doi.org/10.3389/fpsyg.2019.02984>