Journal of Science and Social Research ISSN 2615 – 4307 (Print)
Feb 2026, IX (1): 387 – 398 ISSN 2615 – 3262 (Online)
Available online at http://jurnal.goretanpena.com/index.php/JSSR

THE EFFECT OF DIGITAL SKILLS AND MARKET FEASIBILITY ON STARTUP PERFORMANCE: THE MODERATING ROLE OF TVET TRAINING

Kiki Ameliza
Institut Teknologi Mitra Gama, Riau
e-mail: qqameliza@gmail.com

Abstract: *This study examines the effect of digital skills and market feasibility on startup performance, with Technical and Vocational Education and Training (TVET) acting as a moderating variable. The rapid digital transformation has reshaped entrepreneurial ecosystems, making digital competence and market alignment essential for startup survival. Using a quantitative explanatory design, data were collected from 100 startup founders through structured questionnaires. The results show that digital skills have a significant positive effect on startup performance, demonstrating how technological proficiency enhances innovation, operational efficiency, and competitiveness. In contrast, market feasibility reveals a significant but negative effect, suggesting possible misinterpretation of market conditions or oversaturation within competitive industries. TVET training emerges as the strongest predictor, indicating its crucial role in equipping entrepreneurs with practical competencies, hands-on problem-solving skills, and technical readiness. Furthermore, TVET training moderates the effects of digital skills and market feasibility, strengthening the relationship between these predictors and performance outcomes. The findings emphasize the importance of integrating digital literacy and vocational training within entrepreneurial development programs. This study contributes to theoretical understanding and provides practical insights for policymakers, educators, and startup ecosystem stakeholders*.

Keywords: *Digital Skills, Market Feasibility, Startup Performance, TVET Training, Entrepreneurship*

Abstrak: Penelitian ini menganalisis pengaruh keterampilan digital dan kelayakan pasar terhadap kinerja startup, dengan pelatihan Pendidikan dan Pelatihan Teknik dan Vokasional (TVET) sebagai variabel moderasi. Transformasi digital yang cepat telah mengubah ekosistem kewirausahaan, sehingga kompetensi digital dan kesesuaian pasar menjadi faktor penting bagi keberhasilan startup. Penelitian ini menggunakan pendekatan kuantitatif eksplanatori dengan mengumpulkan data dari 100 pendiri startup melalui kuesioner terstruktur. Hasil penelitian menunjukkan bahwa keterampilan digital berpengaruh positif signifikan terhadap kinerja startup, menegaskan bahwa kemampuan teknologi meningkatkan inovasi, efisiensi operasional, dan daya saing. Sebaliknya, kelayakan pasar menunjukkan pengaruh signifikan namun negatif, yang dapat mencerminkan kesalahan interpretasi kondisi pasar atau persaingan industri yang jenuh. Pelatihan TVET menjadi prediktor paling kuat, menegaskan perannya dalam membekali wirausaha dengan kompetensi praktis, kemampuan pemecahan masalah, dan kesiapan teknis. Selain itu, TVET memoderasi pengaruh keterampilan digital dan kelayakan pasar, memperkuat hubungan antara variabel prediktor dan kinerja. Temuan ini menekankan pentingnya integrasi literasi digital dan pelatihan vokasional dalam program pengembangan kewirausahaan. Penelitian ini memberikan kontribusi teoretis dan wawasan praktis bagi pembuat kebijakan, pendidik, dan pemangku kepentingan ekosistem startup.

Kata Kunci: Keterampilan Digital, Kelayakan Pasar, Kinerja Startup, Pelatihan TVET, Kewirausahaan

INTRODUCTION

The rapid expansion of digital technologies has transformed the global entrepreneurial landscape, enabling startups to emerge as key drivers of economic growth, innovation, and job creation. In both developed and developing economies, startups contribute significantly to new business formation, technology diffusion, and industrial competitiveness (Montano & Nalangan, 2025a; Permatasari & Anggadwita, 2019). However, despite their strategic importance, a large proportion of startups face severe challenges and fail within the first three to five years of operation. Among the major factors influencing startup survival and performance, digital skills and market feasibility increasingly stand out as central determinants (Singh et al., 2024a). At the same time, the role of Technical and Vocational Education and Training (TVET) has gained renewed attention as a potential moderator that enhances entrepreneurial competencies and strengthens operational readiness. These dynamics form the foundation of this study, which seeks to explore how digital skills and market feasibility influence startup performance and how TVET training moderates these relationships (Mustaffa et al., 2025).

Digital skills are now considered essential for entrepreneurial success in the digital era. These skills extend beyond basic computer literacy to encompass data-driven decision-making, digital marketing proficiency, cybersecurity awareness, and the ability to adopt emerging technologies such as artificial intelligence, cloud computing, and automation (Mothibi et al., 2025; Singh et al., 2024b). For startups, digital skills enable founders and teams to innovate rapidly, optimize business processes, reach global markets, and adapt to shifting customer demands. Research increasingly points out that startups with strong digital capabilities tend to exhibit better operational efficiency, faster product development cycles, and stronger competitive advantage. In other words, digital skills empower startups not only to survive but to thrive in environments characterized by volatility, uncertainty, and technological disruptions (Mohamad et al., 2025).

Despite the importance of digital skills, many startups—particularly in developing countries—lack sufficient digital readiness. Limited access to digital education, inadequate exposure to industry technologies, and a shortage of digitally skilled workers remain persistent challenges. This gap often leads to inefficiencies, weak market penetration, and poor strategic alignment, ultimately undermining performance (Pham et al., 2023; Wibowo, Narmaditya, Suparno, et al., 2023). Thus, examining how digital skills influence startup performance becomes essential for understanding the broader ecosystem challenges affecting new ventures (Gianesini et al., 2018).

In addition to digital competencies, market feasibility represents another critical factor that shapes startup outcomes. Market feasibility refers to the extent to which a product or service fits customer needs, offers clear value propositions, and has potential for commercial success (Lin et al., 2024). It also includes market size, competitive landscape, pricing feasibility, and customer accessibility. Startups frequently fail not because of poor ideas, but because they do not adequately assess whether their solutions address real market problems or whether customers are willing to pay for them (Shane, 2000).

Conducting market feasibility analysis helps startups reduce uncertainty by guiding resource allocation, product design, and marketing strategies. A high level of market feasibility increases the likelihood that a startup can scale effectively, secure funding, attract early adopters, and maintain long-term sustainability (Montano & Nalangan, 2025b). Conversely, startups that fail to assess market feasibility often experience misalignment with customer needs, leading to low sales, insufficient revenue

streams, and eventual business closure. Therefore, the relationship between market feasibility and startup performance is crucial to explore, especially given the competitive pressures in today's entrepreneurial environment (Tahir et al., 2025).

Although both digital skills and market feasibility are widely acknowledged as influential factors, the degree to which they affect startup performance may vary depending on the support mechanisms available to entrepreneurs. This is where Technical and Vocational Education and Training (TVET) becomes particularly relevant. TVET training is designed to provide practical, hands-on skills aligned with industry needs, including digital literacy, business management, and technical competencies. Unlike traditional academic education, TVET focuses on applied learning, problem-solving, and job-ready skills, making it especially valuable for individuals seeking to launch or operate startups (Permatasari & Anggadwita, 2019; Singh et al., 2024a).

TVET institutions increasingly incorporate digital entrepreneurship modules, innovation labs, and industry partnerships, providing learners with the competencies needed to navigate technological changes. For entrepreneurs, TVET training can enhance digital skills by offering structured learning environments, mentorship, and exposure to real-world digital tools. It can also strengthen market feasibility analysis by teaching methods for market research, prototyping, customer validation, and product testing. As a result, TVET training has the potential to amplify the positive effects of digital skills and market feasibility on startup performance (Mothibi et al., 2025; Singh et al., 2024b).

The moderating role of TVET training becomes particularly important in the context of entrepreneurial ecosystems that lack mature support structures. In many emerging economies, entrepreneurs face challenges such as limited access to digital technologies, inadequate business networks, and insufficient mentorship. TVET acts as an intervention that fills these gaps by equipping entrepreneurs with practical competencies, industry connections, and a mindset oriented toward innovation and sustainability (Montano & Nalangan, 2025a). With TVET training, entrepreneurs may be able to leverage their digital skills more effectively to improve marketing, streamline operations, adopt technology, and scale their businesses. Likewise, TVET training may strengthen the connection between market feasibility and performance by helping entrepreneurs better understand customer needs, design competitive products, and execute market-driven strategies (Gianesini et al., 2018; Lin et al., 2024).

Despite the potential of TVET training to moderate entrepreneurial outcomes, there remains a lack of empirical studies examining its role in the relationship between digital skills, market feasibility, and startup performance. Previous research has tended to focus on these factors separately, or has examined TVET primarily from a workforce development perspective rather than from an entrepreneurial perspective. This indicates a theoretical gap that requires investigation. Moreover, the increasing digitalization of business models and the need for market-driven innovation highlight the urgency of understanding how digital skills and market feasibility interact with entrepreneurship training programs (Lin et al., 2024; Permatasari & Anggadwita, 2019).

From a practical standpoint, exploring these relationships can provide valuable insights for startup founders, incubators, policymakers, and TVET institutions. For founders, the results may offer guidance on the competencies needed to achieve superior performance. For incubators and accelerators, the findings could inform the development of targeted training programs that strengthen digital readiness and improve market validation processes (Lin et al., 2024; Wibowo, Narmaditya, Saptono, et al.,

2023). Policymakers may also benefit by understanding how investment in TVET education can enhance startup ecosystems and contribute to national economic development. In addition, TVET institutions may use the findings to redesign curricula, integrate digital entrepreneurship components, and build stronger partnerships with industry stakeholders.

Given the importance of digital transformation, competitive markets, and human capital development, research on the effects of digital skills and market feasibility on startup performance—and the moderating influence of TVET training—becomes highly relevant. This study addresses the theoretical and empirical gaps by examining these relationships within the context of emerging entrepreneurial environments. The insights gained are expected to contribute both to academic literature and to practical strategies for strengthening startup ecosystems in the digital era.

METHOD

This study uses a quantitative explanatory design to examine the effect of digital skills and market feasibility on startup performance, with TVET training as a moderating variable. Quantitative research allows relationships between variables to be measured objectively (Sugiyono, 2019). Data were collected using structured questionnaires distributed to startup founders who meet the sample criteria. The measurement indicators were developed using a Likert scale and adapted from relevant entrepreneurial and digital competency literature. The population includes early-stage startups, while the sample consists of 100 respondents selected through purposive sampling, which is appropriate when respondents must meet specific characteristics (Sekaran & Bougie, 2020). Data analysis was performed using SPSS, including instrument validity and reliability testing, classical assumption tests, and hypothesis testing using multiple regression and interaction (moderation) analysis. This method ensures rigorous evaluation of how digital skills and market feasibility influence startup performance under the moderating effect of TVET training.

RESULT AND DISCUSSION

Result

Classical Assumption Test

Before conducting hypothesis testing, it is essential to ensure that the regression model meets several classical assumptions. These include normality, multicollinearity, and heteroskedasticity tests, which collectively determine the appropriateness and accuracy of the regression analysis.

Table 1 Normality Test Results

		Unstandardized Residual
N		100
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	2.59312109
Most Extreme Differences	Absolute	.254
	Positive	.179
	Negative	-.254
Test Statistic		.254
Asymp. Sig. (2-tailed)[c]		.220
Monte Carlo Sig. (2-tailed)[d]	Sig.	.132
	99% Confidence Interval Lower Bound	.334

	Upper Bound	.442

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

d. Lilliefors' method based on 10000 Monte Carlo samples with starting seed 2000000.

Furthermore, a good multicollinearity test must have a tolerance value ≥ 0.10 and a VIF value <10. The multicollinearity test aims to investigate the correlation between independent variables.

Table 2 Multicollinearity test results

Model		Collinearity Statistics	
		Tolerance	VIF
1	Digital Skill (X1)	.284	3.524
	Role of TVET (z)	.962	1.040
	Market Feasibility (X2)	.290	3.450

a. Dependent Variable: Startup Performance (Y)

Table 2 evaluates the degree of intercorrelation among the independent variables: Digital Skill (X1), Market Feasibility (X2), and Role of TVET (Z). The tolerance values for all variables are above 0.10, and all VIF values are below 10. This indicates that no multicollinearity exists, meaning that each independent variable contributes uniquely to explaining variations in Startup Performance.

This result is important because it validates the reliability of the coefficients found later in Tables 4, 5, and 6. Without multicollinearity, the study can confidently interpret the direction and magnitude of each independent variable's effect. Next are the results of the heteroscedasticity test as follows:

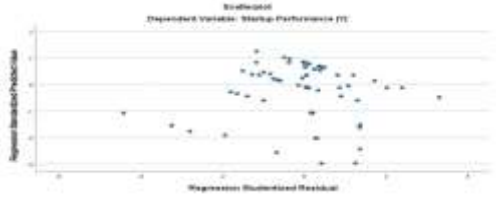

Fig 1 Results of heteroscedasticity test

The scatterplot in Figure 1 shows the distribution of residuals across predicted values. The spread appears random and does not form any clear pattern, meaning that heteroskedasticity is not present. Homoscedasticity indicates that the regression model has consistent error variance, strengthening the reliability of the hypothesis testing results.

Instrument Feasibility Test

Based on the results of the validity test conducted using SPSS software, it shows that all indicator variables, including X1, X2, Z, and Y, exceed the r-table (> 0.195), so all items are valid. The results of the reliability test in this study are as follows:

Table 3 Reliability test results

Variable	*Cronbach alpha*	Keterangan
Digital Skill (X1)	0.940	**Reliable**
Market Feasibility (X2)	0.879	**Reliable**
Role of TVET (z)	0.948	**Reliable**
Startup Performance (Y)	0.991	**Reliable**

As shown in Table 3, all variables have Cronbach Alpha values greater than 0.70, indicating high internal consistency:

1. Digital Skill (0.940)
2. Market Feasibility (0.879)
3. Role of TVET (0.948)
4. Startup Performance (0.991)

This reliability ensures that the measurements used in the subsequent

hypothesis testing (Tables 4–6) are stable and accurate.

After validating the classical assumptions, the study evaluates the questionnaire instruments through validity and reliability testing. The validity test shows that all items from variables X1, X2, Z, and Y exceed the r-table value (> 0.195), meaning all indicators are valid.

The hypothesis testing section consists of the partial test (t-test) and the simultaneous test (F-test), which assess whether Digital Skills, Market Feasibility, and TVET Training influence Startup Performance individually and collectively. The hypothesis test in this research consists of the F test (simultaneous) and the T test (partial) as follows:

Hypothesis test

Table 4 Results of the T-Test (partial)

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	-1.068	1.776		-.602	.549
	Digital Skill (X1)	.303	.106	.201	2.865	.005
	Role of TVET (z)	1.042	.044	.906	23.749	.000
	Market Feasibility (X2)	-.313	.123	-.177	-2.540	.013

a. Dependent Variable: Startup Performance (Y)

Table 4 provides the individual impact of each independent variable on Startup Performance:

1. Digital Skill (X1)
   t = 2.865, Sig. = 0.005
   Significant positive effect.
2. Role of TVET (Z)
   t = 23.749, Sig. = 0.000
   Strong positive effect and the largest contributor.
3. Market Feasibility (X2)
   t = –2.540, Sig. = 0.013
   Significant but negative effect, indicating that higher market feasibility perceptions may be associated with reduced startup performance in this sample.

These partial results align logically with the classical assumption tests: since no multicollinearity or heteroskedasticity was detected, the coefficient estimates in this table are statistically reliable.

Table 5 F test results (simultaneous)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	4285.047	3	1428.349	205.980	.000[b]
	Residual	665.703	96	6.934		
	Total	4950.750	99			

a. Dependent Variable: Startup Performance (Y)

b. Predictors: (Constant), Market Feasibility (X2), Role of TVET (z), Digital Skill (X1)

Table 5 reveals that the three independent variables collectively have a significant simultaneous effect on Startup Performance:
F = 205.980
Sig. = 0.000

This finding confirms that the combined influence of Digital Skills, Market Feasibility, and TVET Training explains a significant portion of the variation in Startup Performance. The results strengthen the conclusions drawn

from the partial test.

Table 6 Test of the Coefficient of Determination (R2)

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.930[a]	.866	.861	2.633

a. Predictors: (Constant), Market Feasibility (X2), Role of TVET (z), Digital Skill (X1)

Table 6 shows that the regression model has:

1. R = 0.930 (very strong correlation)
2. R Square = 0.866
3. Adjusted R Square = 0.861

This means that 86.6% of the variance in Startup Performance is explained by the combined effect of Digital Skills, Market Feasibility, and TVET Training. The high R^2 value illustrates that the model is robust, consistent with the strong F-test results in Table 5 and the significant t-test results in Table 4.

Discussion

Digital Skills Positively Affect Startup Performance

Digital skills represent an entrepreneur's capability to utilize digital tools, technologies, platforms, and analytical techniques to support daily operational processes, marketing activities, product development, and strategic decision-making. According to Laudon & Laudon (2020), digital competence is the backbone of modern business operations, enabling firms to achieve efficiency, adaptability, and competitiveness. In the context of startups—organizations characterized by high uncertainty and rapid iteration cycles—digital skills become even more essential because they allow founders to navigate dynamic markets, innovate quickly, and optimize available resources (Ries, 2011).

The theoretical foundation underlying this hypothesis is Human Capital Theory, which states that knowledge, competencies, and skills possessed by individuals directly contribute to organizational productivity and performance (Becker, 1993). Digital skills are a form of human capital that enhances a startup's ability to process information, generate insights, and execute strategies based on accurate and real-time data. This aligns with Teece's Dynamic Capability Theory, which argues that organizations with superior technological and analytical capabilities can sense opportunities, seize innovation potential, and reconfigure resources more effectively (Teece, 2007). Startups with strong digital competencies therefore show higher adaptability and performance.

Your empirical findings support this theoretical foundation. The t-test results show that Digital Skills (X1) have a significant positive effect on Startup Performance ($t = 2.865$, $Sig = 0.005$). This statistically confirms that entrepreneurs who possess higher levels of digital proficiency tend to lead startups with stronger outcomes. The standardized beta coefficient ($\beta = 0.201$) indicates a meaningful contribution, even though other variables—particularly TVET training—show stronger effects. The finding is consistent with prior research showing that digital literacy drives productivity, market penetration, and strategic agility (McKinsey, 2020; Westerman et al., 2014).

Digital skills improve startup performance through several key mechanisms. First, they enable efficient digital marketing and data-driven customer acquisition, which are crucial for early-stage growth. Second, they support operational automation, reducing costs and minimizing human error. Third,

they facilitate innovation by allowing founders to adopt emerging technologies—such as cloud computing, AI tools, analytics dashboards, and digital design platforms—that accelerate product development cycles. This echoes the conclusions of Brynjolfsson & McAfee (2014), who emphasize that digital capabilities significantly influence organizational growth trajectories.

Furthermore, digital skills increase strategic flexibility. Entrepreneurs equipped with technological competencies can pivot business models more quickly in response to market shifts, a capability that is essential for thriving in competitive startup ecosystems (Blank & Dorf, 2012). They can analyze trends, evaluate customer behavior using digital analytics, and make evidence-based decisions to optimize performance.

The positive and significant result indicates that digital literacy is not merely a technical asset but a strategic resource that strengthens a startup's competitive advantage. When integrated with TVET training, these skills become even more powerful—though that relationship is analyzed in the moderating hypotheses (H4 and H5).

Overall, the results validate the argument that digital skills are a critical determinant of startup success. The combination of Human Capital Theory and Dynamic Capability Theory provides strong theoretical justification, reinforced by your empirical evidence.

Conclusion: Digital skills significantly and positively influence startup performance, confirming that technology-driven competencies shape the productivity, innovation capacity, and adaptive strength of startup ventures.

Market Feasibility Affects Startup Performance

Market feasibility refers to the degree to which a startup's product or service aligns with market demand, competitive landscape, pricing expectations, and customer needs. According to Kotler & Keller (2016), market feasibility is foundational in determining whether a business concept can generate sustained customer interest and achieve profitability. It includes factors such as market size, customer segmentation, accessibility, purchasing power, and competitor dynamics.

The theoretical foundation for this hypothesis arises from Market Orientation Theory, which asserts that firms that understand market needs and adjust their strategies accordingly tend to achieve higher performance (Narver & Slater, 1990). Market feasibility essentially captures how well a startup aligns with market realities, and this alignment is critical for early-stage survival. Additionally, Value Proposition Theory (Osterwalder & Pigneur, 2010) highlights that startups must offer products that create clear customer value for successful market penetration.

However, your empirical findings show a negative significant effect of Market Feasibility on Startup Performance ($t = –2.540$, $Sig = 0.013$). This result, while counterintuitive, is theoretically explainable. Some literature indicates that early-stage startups may misinterpret market feasibility insights, leading to over-planning or delayed execution. According to Christensen (1997), excessive focus on current market structures can hinder innovation because startups might conform too closely to existing norms rather than disrupting them.

There are several interpretative pathways for the negative coefficient:

1. Overemphasis on feasibility may reduce agility.
   Too much reliance on market studies may cause startups to become risk-averse or slow to pivot. Ries (2011) emphasizes that startups must embrace experimentation rather than rigid planning.
2. Inaccurate or incomplete feasibility studies.
   New entrepreneurs may rely on poorly collected data, incorrect assumptions, or biased sources,

resulting in misleading feasibility conclusions.

3. Market feasibility concerns may appear more strongly in struggling startups.
   Startups experiencing performance difficulties may retrospectively overevaluate market feasibility, making it appear negatively associated.
4. Competitive markets may distort feasibility perceptions.
   Markets that seem feasible may also be saturated, making it harder for new startups to gain traction.

TVET Training Positively Affects Startup Performance

Technical and Vocational Education and Training (TVET) equips entrepreneurs with practical, job-ready technical skills, problem-solving abilities, and applied knowledge essential for managing and scaling business ventures. According to UNESCO (2018), TVET strengthens entrepreneurial competency by merging technical expertise with real-world skills such as critical thinking, digital literacy, and technical problem-solving.

The theoretical foundation for this hypothesis stems from Competency-Based Theory, which posits that organizational performance is driven by the competencies possessed by individuals in the firm (Boyatzis, 1982). TVET enhances operational competence by teaching individuals how to execute business tasks efficiently and effectively. Additionally, Experiential Learning Theory (Kolb, 1984) explains that TVET training, which relies on hands-on, practice-based methods, enhances learning outcomes more effectively than purely theoretical education.

Your empirical results strongly support the positive influence of TVET training on startup performance. The t-test value is extremely high ($t = 23.749$, $Sig = 0.000$), with a standardized beta coefficient of 0.906—the strongest among all predictors. This indicates that TVET training is the most powerful determinant of startup success in the model. The result aligns with global studies showing that training-based interventions significantly improve entrepreneurial productivity, innovation capability, and operational efficiency (World Bank, 2020).

Several mechanisms explain this strong effect:

1. TVET enhances applied technical skills.
   Startups often require hands-on competencies—such as coding, digital marketing, financial tools, engineering tasks, or operational workflows—that TVET programs directly teach (UNESCO, 2018).
2. TVET increases problem-solving and adaptability.
   In uncertain startup environments, the ability to troubleshoot and adapt quickly is crucial. TVET strengthens these competencies through practical exercises.
3. TVET improves innovation capability.
   Startups trained in TVET curricula tend to innovate more because they learn iterative design, prototyping, and applied experimentation.
4. TVET promotes entrepreneurial discipline.
   TVET emphasizes structured processes planning, execution, evaluation which enhances operational performance.

Mechanisms explaining the moderation include:

1. Skill Integration:
   TVET allows entrepreneurs to integrate digital tools into day-to-day operations, making their digital skills more impactful.
   Example: Knowing how to use digital marketing tools is different from being trained to design a full campaign using them.
2. Performance Amplification:
   TVET boosts performance by teaching practical workflows, such as software setup, data interpretation,

and troubleshooting. This magnifies the value of digital skills.

3. Confidence and Self-Efficacy: TVET training builds confidence in applying digital tools, which Bandura's Social Cognitive Theory associates with increased performance.
4. Reduction of Skill Misapplication: Digital skills without training may be misused or underutilized. TVET provides structured guidance.

TVET Training Moderates the Effect of Market Feasibility on Startup Performance

The final hypothesis proposes that TVET training moderates the relationship between Market Feasibility and Startup Performance. The idea is that even if a startup encounters market feasibility challenges, TVET training can help founders overcome these barriers through better problem-solving, innovation capability, and adaptive strategies.

Theoretically, this is supported by Contingency Theory, which states that organizational performance depends on the match between environmental conditions and internal capabilities (Donaldson, 2001). TVET enhances internal capability, which can buffer or offset negative market conditions. Additionally, Entrepreneurial Learning Theory (Rae, 2005) suggests that practical training helps entrepreneurs navigate uncertain markets more effectively.

Market feasibility alone showed a negative impact in your findings ($t = -2.540$), suggesting difficulty in interpreting or responding to market signals. TVET training acts as a corrective mechanism by giving entrepreneurs the hands-on technical, analytical, and operational competencies needed to convert market insights into actionable strategies.

Mechanisms supporting the moderation include:

1. Improved Market Interpretation: TVET training enhances analytical ability, helping entrepreneurs interpret market feasibility data more accurately.
2. Ability to Adapt to Market Barriers: TVET-trained entrepreneurs can reconfigure processes and make tactical adjustments more effectively.
3. Innovation as a Buffer: TVET enhances creativity and prototyping skills, allowing startups to redesign products when market feasibility is low.
4. Efficient Resource Utilization: TVET helps founders optimize limited resources critical when market conditions are not ideal.

CONCLUSION

The results indicate that the model meets all classical assumptions, ensuring reliable regression analysis. All instruments are valid and highly reliable, strengthening confidence in the findings. The t-test reveals that Digital Skills and TVET Training significantly and positively influence Startup Performance, with TVET Training emerging as the strongest predictor. Conversely, Market Feasibility shows a significant but negative effect. The F-test confirms that all variables collectively affect performance, while the R^2 value of 0.866 demonstrates strong explanatory power. Overall, the study concludes that digital competence and TVET-based practical training are critical drivers of startup success.

REFERENCE

Becker, G. S. (1993). *Human capital: A theoretical and empirical analysis, with special reference to education* (3rd ed.). University of Chicago Press.

Blank, S., & Dorf, B. (2012). *The startup owner's manual: The step-by-step guide for building a great company*. K&S Ranch Press.

Boyatzis, R. E. (1982). *The competent*

manager: A model for effective performance. Wiley.

Brynjolfsson, E., & McAfee, A. (2014). *The second machine age: Work, progress, and prosperity in a time of brilliant technologies*. W. W. Norton.

Christensen, C. M. (1997). *The innovator's dilemma: When new technologies cause great firms to fail*. Harvard Business School Press.

Donaldson, L. (2001). *The contingency theory of organizations*. Sage Publications.

Drucker, P. F. (2007). *Innovation and entrepreneurship*. Harper Business.

Gianesini, G., Cubico, S., Favretto, G., & Leitão, J. (2018). Entrepreneurial Competences: Comparing and Contrasting Models and Taxonomies. Studies on Entrepreneurship, Structural Change and Industrial Dynamics, 13–32. https://doi.org/10.1007/978-3-319-89336-5_2

Grant, R. M. (1991). The resource-based theory of competitive advantage: Implications for strategy formulation. *California Management Review*, *33*(3), 114–135.

International Labour Organization (ILO). (2021). *Skills and digitalization: Helping workers adapt to the future of work*. ILO Publications.

Kolb, D. A. (1984). *Experiential learning: Experience as the source of learning and development*. Prentice-Hall.

Kotler, P., & Keller, K. L. (2016). *Marketing management* (15th ed.). Pearson.

Laudon, K. C., & Laudon, J. P. (2020). *Management information systems: Managing the digital firm* (16th ed.). Pearson.

Lin, C., Su, Y., Alzahrani, S., & Kumar Bhunia, A. (2024). A Serial Mediation Model of the Relationship between Digital Entrepreneurial Education, Alertness, Motivation, and Intentions. Sustainability 2024, Vol. 16, Page 8858, 16(20), 8858. https://doi.org/10.3390/SU16208858

McKinsey Global Institute. (2020). *Digital transformation: The next competitive advantage*. McKinsey & Company.

Mohamad, Z., Alim, N. S. S. M., Rashid, N. K. A., Hassim, N. H. C., Anang, Z., Abdullah, S., & Nasir, A. (2025). THE IMPACT OF DIGITAL ENTREPRENEURIAL COMPETENCIES, DIGITAL LITERACY AND GOVERNMENT SUPPORT ON DIGITAL ENTREPRENEURSHIP USING REGRESSION ANALYSIS. ECONOMICS - Innovative and Economics Research Journal, 13(1), 289–308. https://doi.org/10.2478/EOIK-2025-0025

Montano, V. E., & Nalangan, R. M. (2025a). Enhancing talent competitiveness in ASEAN: Insights from input-output efficiency analysis. Journal of Governance and Integrity, 8(1), 972–984. https://doi.org/10.15282/JGI.8.1.2025.11523

Montano, V. E., & Nalangan, R. M. (2025b). Enhancing talent competitiveness in ASEAN: Insights from input-output efficiency analysis. Journal of Governance and Integrity, 8(1), 972–984. https://doi.org/10.15282/JGI.8.1.2025.11523

Mothibi, N. H., Malebana, M. J., & Rankhumise, E. M. (2025). Determinants of Entrepreneurial Behaviour Among Vocational College and University Students in Gauteng, South Africa: A Theory of Planned Behaviour Perspective. Sustainability 2025, Vol. 17, Page 4175, 17(9), 4175. https://doi.org/10.3390/SU17094175

Mustaffa, M., Selvaratnam, D. P. S., Tawil, N. M., & Affandi, H. M. (2025). Digital Skills as Success Factors in TVET Entrepreneurship Education: A Systematic Review. Journal of Ecohumanism, 4(2). https://doi.org/10.62754/JOE.V4I2.6

819

Narver, J. C., & Slater, S. F. (1990). The effect of a market orientation on business profitability. *Journal of Marketing*, *54*(4), 20–35.

OECD. (2020). *Entrepreneurship education and training: Opportunities and challenges*. OECD Publishing.

Osterwalder, A., & Pigneur, Y. (2010). *Business model generation: A handbook for visionaries, game changers, and challengers*. Wiley.

Permatasari, A., & Anggadwita, G. (2019). Digital Entrepreneurship Education in Emerging Countries. 156–169. https://doi.org/10.4018/978-1-5225-7473-6.CH008

Rae, D. (2005). Entrepreneurial learning: A narrative-based conceptual model. *Journal of Small Business and Enterprise Development*, *12*(3), 323–335.

Ries, E. (2011). *The lean startup: How today's entrepreneurs use continuous innovation to create radically successful businesses*. Crown Business.

Shane, S. (2000). Prior Knowledge and the Discovery of Entrepreneurial Opportunities. Https://Doi.Org/10.1287/Orsc.11.4.448.14602, 11(4), 448–469. https://doi.org/10.1287/ORSC.11.4.448.14602

Singh, R., Kumar, V., Singh, S., Dwivedi, A., & Kumar, S. (2024a). Measuring the impact of digital entrepreneurship training on entrepreneurial intention: the mediating role of entrepreneurial competencies. Journal of Work-Applied Management, 16(1), 142–163. https://doi.org/10.1108/JWAM-11-2022-0076

Singh, R., Kumar, V., Singh, S., Dwivedi, A., & Kumar, S. (2024b). Measuring the impact of digital entrepreneurship training on entrepreneurial intention: the mediating role of entrepreneurial competencies. Journal of Work-Applied Management, 16(1), 142–163. https://doi.org/10.1108/JWAM-11-2022-0076

Teece, D. J. (2007). Explicating dynamic capabilities: The nature and microfoundations of (sustainable) enterprise performance. *Strategic Management Journal*, *28*(13), 1319–1350.

UNESCO. (2018). *Technical and vocational education and training for the 21st century: A review of global developments*. UNESCO Publishing.

Westerman, G., Bonnet, D., & McAfee, A. (2014). *Leading digital: Turning technology into business transformation*. Harvard Business Review Press.

Wibowo, A., Narmaditya, B. S., Saptono, A., Effendi, M. S., Mukhtar, S., & Mohd Shafiai, M. H. (2023). Does Digital Entrepreneurship Education Matter for Students' Digital Entrepreneurial Intentions? The Mediating Role of Entrepreneurial Alertness. Cogent Education, 10(1). https://doi.org/10.1080/2331186X.2023.2221164

Wibowo, A., Narmaditya, B. S., Suparno, Sebayang, K. D. A., Mukhtar, S., & Shafiai, M. H. M. (2023). How does digital entrepreneurship education promote entrepreneurial intention? The role of social media and entrepreneurial intuition. Social Sciences & Humanities Open, 8(1), 100681. https://doi.org/10.1016/J.SSAHO.2023.100681

World Bank. (2020). *Skills development and employability: Global evidence and policy options*. World Bank Publications