

THE EFFECT OF TECHNOPRENEURIAL SELF-EFFICACY ON TECHNOPRENEURSHIP INTENTION: THE MODERATING ROLE OF TECHNOPRENEURIAL MOTIVATION

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Keyword

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Abstract

This study examines the effect of technopreneurial self-efficacy (TSE) on technopreneurship intention (TI) among non-engineering university students, with technopreneurial motivation (TM) as a moderating variable. Grounded in the Theory of Planned Behavior, TSE reflects perceived behavioral control, while TM functions as a motivational driver that can strengthen intention formation. A quantitative survey was conducted with 224 non-engineering undergraduates at Universitas Pendidikan Indonesia who had completed at least one entrepreneurship-related course. Data were collected via an online questionnaire using validated measurement scales and analyzed through Partial Least Squares–Structural Equation Modeling (PLS-SEM). The results reveal that TSE has a significant positive effect on TI ($p < 0.001$), TM positively influences TI ($p < 0.001$), and TM significantly moderates the TSE–TI relationship ($p = 0.014$), although with a small effect size. The model accounts for 65.9% of the variance in TI, emphasizing the combined influence of capability beliefs and motivational forces on technopreneurial intentions. These findings extend the Theory of Planned Behavior by integrating a motivational construct into the prediction of technology-based entrepreneurial intention, particularly within the underexplored context of non-technical students. The study recommends that higher education institutions adopt integrative interventions—such as experiential learning, mentoring, and digital business simulations—to concurrently strengthen self-efficacy and nurture intrinsic motivation, thereby fostering a more inclusive and innovative technopreneurship ecosystem.

INTRODUCTION

The rapid advancement of digital technology has positioned entrepreneurship as a key driver of innovation and economic growth (Alamsyah & Ie, 2022). Among its various forms, technopreneurship integrates technological expertise to deliver innovative solutions in the digital era (Alamsyah & Ie, 2022; Koe et al., 2021; Putri et al., 2024). Despite its strategic importance, Indonesia's technopreneurship intention remains relatively low compared to neighboring countries, contributing to educated unemployment and the slow growth of the national startup ecosystem (Belmonte et al., 2022; Dutse et al., 2013; Hadi et al., 2020). Data from the (Global Entrepreneurship Monitor, 2021) show that Indonesia records only 12.3% in technopreneurship intention, well below Singapore, Thailand, and Malaysia, despite internet penetration reaching 79.5% in 2024 (Asosiasi Penyelenggara Jasa Internet Indonesia, 2024). Studies further reveal that only 0.43% of entrepreneurs engage in technopreneurship (Machmud et al., 2019), and although 35% of university students express the intention to start a business within three years, only a small fraction realize this through technology-based ventures (Global University Entrepreneurial

Spirit Students' Survey, 2023). This gap between potential and realization underscores structural and individual barriers to transforming entrepreneurial intention into tangible technopreneurial activities.

One group particularly affected by these challenges is non-technical university students, who often face limited technological competence, low self-confidence, and minimal exposure to digital business practices (Putri et al., 2024). Such limitations restrict innovation diversity and hinder the development of an inclusive digital economy (Ferreira et al., 2020). Research indicates that students in technical disciplines generally have higher technopreneurship intention compared to non-technical students, largely due to differences in access to technological knowledge and practical experience (Hanifah et al., 2022).

The Theory of Planned Behavior (TPB) proposed by (Ajzen, 1991) offers a comprehensive framework for explaining technopreneurship intention, in which technopreneurial self-efficacy (TSE) plays a crucial role. TSE reflects the belief in one's ability to overcome challenges in starting and managing technology-based ventures (Ferreira et al., 2020; Zhao et al., 2005). Individuals with high TSE are more likely to pursue technology-based entrepreneurial activities as they feel confident in their skills and adaptability. However, empirical findings on the effect of TSE on technopreneurship intention remain inconsistent (Machmud et al., 2019; Rahim et al., 2023; Soomro & Shah, 2021; Utami, 2019), suggesting the presence of moderating variables.

This study introduces technopreneurial motivation (TM) as a moderating variable. While TM is not a core component of TPB, it can enrich the model's explanatory power (Fishbein & Ajzen, 2010; Linan & Chen, 2009). Motivation, particularly the drive to achieve personal and professional goals, may amplify the influence of TSE on technopreneurship intention (Ferreira et al., 2020; Van de Velde et al., 2017). By focusing on the low participation of non-technical students and addressing the inconsistencies in prior findings, this research aims to provide empirical evidence and practical recommendations for developing an inclusive and innovative technopreneurship ecosystem.

METHOD

This study employed a quantitative research design with a survey approach to examine the relationship between technopreneurial self-efficacy (TSE) and technopreneurship intention (TI), moderated by technopreneurial motivation (TM). The population consisted of non-engineering undergraduate students at Universitas Pendidikan Indonesia (UPI) who had completed at least one entrepreneurship-related course. The sample comprised 224 respondents, determined based on the minimum sample size requirement for Partial Least Squares-Structural Equation Modeling (PLS-SEM) analysis as recommended by (Hair et al., 2017). A random sampling technique was applied to ensure equal selection opportunities for all eligible students.

Three constructs were examined in this study: TI, TSE, and TM as a moderating variable. TI was measured through indicators of commitment, determination, and interest; TSE included indicators of startup ability, technical knowledge, and business planning; while TM encompassed ambition and intrinsic drive. The research was conducted at Universitas Pendidikan Indonesia (UPI), Bandung, Indonesia, with data collection taking place between March and April 2025.

The measurement instrument was adapted from validated scales developed by (Ajzen, 2002) and (Linan & Chen, 2009), consisting of 16 items rated on a 7-point Likert scale ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Specifically, 6 items measured TI, 6 items measured TSE, and 4 items measured TM. A pilot test was conducted with a separate sample of 30 students to evaluate the initial validity and reliability. Cronbach's Alpha values for all constructs exceeded 0.70, meeting the acceptable threshold for internal consistency (Nunnally & Bernstein, 1994). Furthermore, Exploratory Factor Analysis (EFA) confirmed the construct validity of the measurement model (Hair et al., 2019).

Data collection was carried out through an online questionnaire distributed via Google Forms. The link was shared in student WhatsApp groups along with a brief explanation of the research objectives and informed consent. The survey remained open for two weeks, and only complete responses were considered valid.

Data analysis was performed using PLS-SEM with SmartPLS software. The evaluation process consisted of two stages: the measurement model assessment, which examined reliability through Cronbach's Alpha and Composite Reliability, and convergent validity through Average Variance Extracted (AVE) (Fornell & Larcker, 1981; Hair et al., 2019); followed by the structural model assessment, which tested both direct and moderating effects using the bootstrapping procedure (Chin, 1998).

RESULTS

Demographic Profile of Respondents

A total of 224 respondents participated in this study. As shown in *Table 1*, the majority were female (65.63%), while 34.37% were male. Most respondents were undergraduate students (78.13%), with the rest at the master's level (21.87%). In terms of faculty, the largest proportion came from the Faculty of Economics and Business Education (56.25%), followed by the Faculty of Sports and Health Education (21.88%), the Faculty of Language and Literature Education (12.50%), and the Faculty of Mathematics and Natural Sciences Education (9.37%). Furthermore, 71.88% had attended entrepreneurship education, indicating a substantial exposure to entrepreneurial knowledge among participants.

Table 1. Demographic Data

	Category	Frequency	Percentage
Gender	Male	77	34,37%
	Female	147	65,63%
	Total	224	100%
Level of education	S1	175	78,13%
	S2	49	21,87%
	Total	224	100%
Faculty	FPEB	126	56,25%
	FPOK	49	21,88%
	FPBS	28	12,5%
	FPMIPA	21	9,37%
	Total	224	100%
Entrepreneurship education background	Has attended entrepreneurship education	161	71,88%
	Has not attended entrepreneurship education	63	28,12%
	Total	224	100%

Source: Processed Data, 2025

Measurement Model Results

The measurement model was assessed using *outer loadings*, Average Variance Extracted (AVE), Composite Reliability (CR), and Cronbach's Alpha. All outer loading values exceeded 0.70, indicating strong indicator reliability. AVE values ranged from 0.720 to 0.757, surpassing the 0.50 threshold and confirming convergent validity. CR values ranged from 0.905 to 0.943, with Cronbach's Alpha values above 0.894, indicating good internal consistency. Discriminant validity, assessed using the HTMT criterion, showed all values below 0.85, confirming construct distinctiveness.

Table 2. Measurement Model Results

Variable	Outer Loadings Range	AVE	CR	Cronbach's Alpha
TI	0.754 – 0.911	0.750	0.943	0.932

Variable	Outer Loadings Range	AVE	CR	Cronbach's Alpha
TM	0.859 – 0.887	0.757	0.905	0.894
TSE	0.773 – 0.924	0.720	0.931	0.922

Source: Processed Data, 2025

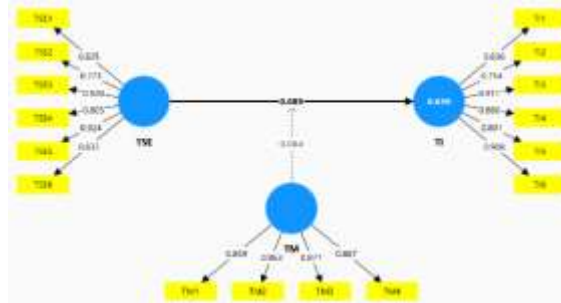


Figure 1. SEM-PLS Model

Source: Processed Data, 2025

Structural Model Results

The structural model evaluation indicated an R^2 value of 0.659 for Technopreneurship Intention (TI), suggesting that Technopreneurial Self-Efficacy (TSE) and Technopreneurial Motivation (TM) explained 65.9% of the variance in TI. Effect size (f^2) analysis showed that TSE had a large effect (1.217), TM had a medium effect (0.170), and the moderating effect of $TM \times TSE$ was small (0.017). Model fit indices yielded SRMR = 0.121 and NFI = 0.609, indicating acceptable predictive relevance despite not meeting strict covariance-based fit thresholds.

Table 3. Structural Model Results

Variable	R^2	f^2	Effect Size Description
TI	0.659	-	-
TM \rightarrow TI	-	0.170	Medium
TSE \rightarrow TI	-	1.217	Large
TM \times TSE \rightarrow TI	-	0.017	Small

Source: Processed Data, 2025

Model Fit

The model fit indices are presented in Table 4. The Standardized Root Mean Square Residual (SRMR) value was 0.121 for both the saturated and estimated models, exceeding the conventional threshold of 0.08. The Normed Fit Index (NFI) value was 0.609, below the commonly accepted cutoff of 0.90. Although these indices suggest a less than optimal fit by covariance-based SEM standards, the model remains acceptable given its adequate predictive power, as indicated by the R^2 value and significant path coefficients.

Table 4. Model Fit

	<i>Saturated Model</i>	<i>Estimated Model</i>
SRMR	0.121	0.121
d_ULS	2.002	2.003
d_G	1.942	1.940
Chi-square	1790.425	1790.867
NFI	0.609	0.609

Source: Processed Data, 2025

Hypothesis Testing

The bootstrapping procedure (Figure 2) confirmed that all hypothesized relationships were significant ($p < 0.05$). TSE had a strong positive effect on TI ($O = 0.689$, $p = 0.000$), TM positively influenced TI ($O = 0.263$, $p = 0.000$), and TM significantly moderated the TSE-TI relationship ($O = 0.084$, $p = 0.014$), albeit with a small effect size.

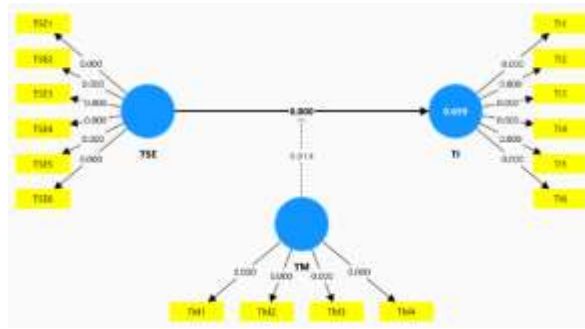


Figure 2. Bootstrapping Results

Source: Processed Data, 2025

Table 5. Hypothesis Testing Results (Path Coefficient)

	Original sample (O)	Sample mean (M)	Standard deviation (STDEV)	T Statistics (O/STDEV)	P Values	Decision
TM→TI	0.263	0.267	0.043	6.091	0.000	Significant
TSE→TI	0.689	0.688	0.040	17.105	0.000	Significant
TM x TSE →TI	0.084	0.084	0.034	2.446	0.014	Significant

Source: Processed Data, 2025

DISCUSSION

The analysis confirmed that the measurement model exhibited satisfactory validity and reliability, ensuring that subsequent hypothesis testing was grounded on a robust foundation. The results demonstrated that technopreneurial self-efficacy (TSE) and technopreneurial motivation (TM) both exert significant positive effects on technopreneurship intention (TI), with TM further strengthening the relationship between TSE and TI. These findings are consistent with the Theory of Planned Behavior (TPB) (Ajzen, 1991), which positions perceived behavioral control and motivational drivers as critical determinants of behavioral intention. In this context, TSE reflects perceived behavioral control by capturing individuals' confidence in managing both technical and managerial challenges inherent in technology-based ventures (Ajzen, 2002; Chen et al., 1998).

The positive association between TSE and TI aligns with prior studies indicating that self-efficacy is a significant predictor of entrepreneurial intentions in technological contexts (Agung, 2023; Alamsyahri & Ie, 2022; Belmonte et al., 2022; Koe et al., 2021; Salhieh & Al-Abdallat, 2022). However, this outcome contradicts previous research reporting no significant effect of TSE on TI (Hoque et al., 2017; Machmud et al., 2019; Utami, 2019). Such inconsistencies suggest that contextual and demographic variables, such as academic background or exposure to entrepreneurial ecosystems, may influence the strength of this relationship.

Similarly, TM was found to significantly and positively influence TI. While TM is not explicitly incorporated within TPB's original constructs, it can be interpreted as an antecedent shaping attitudes and reinforcing the motivational basis of intention (Utami, 2018). This finding is consistent with earlier research affirming the positive role of TM in fostering entrepreneurial intentions (Utami, 2019; Waspada et al., 2024), yet diverges from studies that observed inconsistent motivational effects when not supported by other factors (Koe et al., 2021).

Furthermore, TM significantly moderated the relationship between TSE and TI, indicating that higher levels of motivation amplify the influence of self-efficacy on entrepreneurial intentions. This result aligns with TPB's proposition that motivational factors enhance the predictive power of perceived behavioral control and is consistent with (Utami, 2018) findings that motivation in technological entrepreneurship strengthens the effect of self-efficacy on intention.

CONCLUSION

This study confirms that technopreneurial self-efficacy (TSE) and technopreneurial motivation (TM) significantly and positively influence technopreneurship intention (TI) among non-engineering students, with TM strengthening the TSE–TI relationship. Within the Theory of Planned Behavior (TPB) framework, TSE reflects perceived behavioral control, while TM acts as a motivational enhancer.

The novelty lies in integrating motivational constructs into TPB in the underexplored context of non-technical technopreneurship, offering a theoretical extension that demonstrates motivation's moderating role in amplifying self-efficacy's impact on intention.

It is recommended that universities implement programs that simultaneously build entrepreneurial confidence and foster intrinsic motivation, particularly through experiential learning, mentoring, and digital business simulations. Future research should incorporate additional psychological and environmental variables to further explain technopreneurial intentions.

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