

Educate to Activate: A Serial Mediation Approach to Entrepreneurial Intentions among Vocational Students

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ABSTRACT

This study explores how entrepreneurial education shapes students' entrepreneurial intentions through psychological mechanisms. Specifically, it examines the mediating roles of subjective norms, personal attitudes, and perceived behavioral control in this relationship. A survey was conducted involving 366 vocational high school students in Tasikmalaya. The collected data were analyzed using the Serial Multiple Mediation (SMM) model with Hayes' PROCESS macro to test the proposed framework. The results indicate that entrepreneurial education does not have a direct effect on students' entrepreneurial intentions. Instead, its impact is entirely mediated by subjective norms, personal attitudes, and perceived behavioral control, each of which shows a significant positive influence on entrepreneurial intentions. These findings highlight the importance of psychological factors in translating entrepreneurial education into actionable intentions, suggesting that enhancing these factors could improve the effectiveness of entrepreneurship programs.

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Introduction

Entrepreneurship is widely acknowledged as a catalyst for economic growth, employment generation, and innovation across both developed and developing economies (Urbano et al., 2019; Choe & Loo, 2013; Glaeser et al., 2015; Schumpeter, 1983). Entrepreneurial activities not only enhance national productivity but also stimulate the development of productive sectors, thereby contributing to sustainable economic advancement. Despite its strategic role, many developing countries, including Indonesia, continue to face challenges in fostering entrepreneurship. In Indonesia, the proportion of entrepreneurs remains relatively low at 3.1% of the total population, significantly lagging

behind neighboring countries such as Singapore (7%), Malaysia (5%), Thailand (5%), and Vietnam (3.4%). Considering Indonesia's large population and economic potential, increasing the number of entrepreneurs is essential to stimulate inclusive economic development and address persistent unemployment.

In response to this challenge, fostering entrepreneurial intentions, particularly among young individuals, has become a key priority. Entrepreneurial intention has been recognized as the most immediate and reliable predictor of future entrepreneurial behavior (Ozaralli & Rivenburgh, 2016; Ginanjar, 2016; Choo & Wong, 2006; Krueger & Carsrud, 1993). The Theory of Planned Behaviour (TPB) provides a comprehensive framework to explain how entrepreneurial intentions are formed, emphasizing the role of personal attitudes, subjective norms, and perceived behavioral control as key antecedents (Ajzen, 2015; Ajzen, 1991; Wijaya, 2008; Tornikoski & Maal, 2019).

Empirical studies have provided substantial evidence supporting the TPB model in the entrepreneurial context. For example, Van Gelderen et al. (2008) demonstrated that attitudes and perceived behavioral control mediate the influence of entrepreneurial alertness and financial security on entrepreneurial intention. Similarly, Ferreira et al. (2012) highlighted that attitudes significantly affect both perceived behavioral control and entrepreneurial intention, while subjective norms also influence perceived behavioral control. Moreover, Peng et al. (2012) found that subjective norms positively impact entrepreneurial attitudes and self-efficacy, which subsequently influence entrepreneurial intentions.

In addition to these cognitive and social factors, entrepreneurial knowledge has been increasingly recognized as a critical element in shaping entrepreneurial intentions. Jones et al. (2008) and Liñán et al. (2011) emphasized that entrepreneurial knowledge not only fosters entrepreneurial career choices but also influences attitudes, subjective norms, self-efficacy, and ultimately, entrepreneurial intentions. However, contradictory findings remain. For instance, reported that entrepreneurial knowledge does not significantly affect individuals' entrepreneurial intentions, suggesting that further investigation is necessary to clarify these inconsistencies.

Given the strategic role of entrepreneurship in national development and the inconsistencies found in prior studies, especially concerning the role of entrepreneurial knowledge, it is imperative to explore the formation of entrepreneurial intentions within the vocational education context. Vocational students represent a vital target group for entrepreneurial development initiatives due to their proximity to the labor market and practical skill orientation.

However, existing research predominantly focuses on university students, leaving a critical gap in understanding how entrepreneurial knowledge influences intention formation among vocational high school students, particularly in developing economies such as Indonesia. Moreover, limited studies have comprehensively integrated entrepreneurial knowledge with the core psychological mechanisms proposed by the Theory of Planned Behaviour (TPB) within this specific population.

This study addresses these gaps by examining the mediating roles of personal attitudes, subjective norms, and perceived behavioral control in the relationship between entrepreneurial knowledge and entrepreneurial intentions among vocational students as the uniqueness of this research. By doing so, this research offers two key contributions: First, it enriches the entrepreneurial intention literature by extending the TPB framework to include entrepreneurial knowledge as a critical antecedent. Second, the study provides practical insights for policymakers and educators to design more effective entrepreneurship education programs tailored to vocational students, ultimately contributing to Indonesia's efforts in enhancing youth entrepreneurship and economic inclusivity.

Method

The population in this study comprised students from 53 vocational high schools (VHS) located in Tasikmalaya City, West Java, Indonesia with a total student population of 4,364 individuals. A Two-Stage Cluster Random Sampling technique was employed to determine the sample. Based on this procedure, 16 vocational high schools were randomly selected, with a total of 366 students participating as respondents. Data were collected using a structured, self-administered questionnaire consisting of closed-ended questions. The questionnaire items were designed as statements measured using a numerical Likert-type scale 7 points. This choice follows the recommendations of Wu & Leung (2017) and Leung (2011), who emphasize that social science researchers should employ scales with more response points to enhance data normality and better approximate interval properties. The use of a 7-point scale is also grounded in psychological literature, which suggests that humans can process information up to approximately seven levels (Wickens & Carswell, 201; Miller, 1956; Paruolo et al., 2013; Saaty & Ozdemir, 2003; Unsworth, 2007).

For the data analysis, both descriptive statistical techniques and inferential analysis were applied. Specifically, this study utilized a serial multiple mediation analysis following a regression-based approach using the PROCESS Macro for SPSS version 4.1 developed by Hayes (2018). Model 6 of the PROCESS Macro was employed to examine the indirect effect of entrepreneurial knowledge on entrepreneurial intentions through subjective norms, personal attitudes, and perceived behavioral control. The bootstrapping method with 5,000 resamples and a 95% confidence interval was applied to test the significance of the indirect effects. This approach allows for a robust estimation of mediation effects, providing more accurate inferences regarding the relationships among the proposed variables.

Results and Discussion

The findings are presented in Table 1. The total effect of entrepreneurial knowledge on entrepreneurial intentions was found to be significant, with an effect size of 0.297 and a bootstrap confidence interval ranging from 0.249 to 0.345. However, the direct effect of entrepreneurial knowledge on entrepreneurial intentions was not statistically significant, as indicated by the bootstrap confidence interval, which ranged from -0.014 to 0.080, crossing zero. On the other hand, all indirect effects of entrepreneurial knowledge on entrepreneurial intentions, mediated by subjective norms, personal attitudes, and perceived behavioral control, were statistically significant. This is reflected in the bootstrap confidence intervals for each pathway, which did not include zero.

Table 1. Total effect, indirect effect, and total indirect effect

| | Effect | SE | <i>t</i> | BootLLCI | BootULCI |
|---|--------|-------|----------|----------|----------|
| Total effect | 0,297 | 0,024 | 12,167 | 0,249 | 0,345 |
| Dirrect effect | 0,033 | 0,024 | 1,379 | -0,014 | 0,080 |
| Total indirect effect | 0,264 | 0,240 | | 0,217 | 0,316 |
| Indirect effect via subjective norm | 0,034 | 0,089 | | 0,018 | 0,054 |
| Ind. effect via subjective norm and personal attitude | 0,022 | 0,067 | | 0,012 | 0,038 |
| Ind. Effect via subjective norm and perceived behavioral control | 0,015 | 0,005 | | 0,008 | 0,027 |
| Ind. Effect via subjective norm, personal attitude and perceived behavioral control | 0,004 | 0,002 | | 0,001 | 0,008 |
| Indirect effect via personal attitude | 0,070 | 0,015 | | 0,044 | 0,105 |
| Ind. Effect via personal attitude and perceived behavioral control | 0,012 | 0,006 | | 0,001 | 0,023 |
| Ind. Effect via Perceived behavioral control | 0,105 | 0,017 | | 0,074 | 0,143 |

The largest indirect effect was observed through perceived behavioral control, with an effect size of 0.105 and a bootstrap confidence interval ranging from 0.074 to 0.143. In contrast, the smallest indirect effect, with an effect size of 0.015, occurred through the serial mediation pathway involving subjective norms, personal attitudes, and perceived behavioral control. This finding suggests that the inclusion of subjective norms and personal attitudes in the serial mediation model tends to reduce the overall indirect effect.

This study examined the influence of entrepreneurial knowledge on entrepreneurial intentions and further explored the mediating role of subjective norms, personal attitudes, and perceived behavioral control in this relationship. In the proposed multiple mediation model, it was hypothesized that entrepreneurial knowledge would first enhance subjective norms, which in turn would positively influence personal attitudes and perceived behavioral control, ultimately leading to increased entrepreneurial intentions.

The indirect effects obtained through the PROCESS macro are calculated as the product of the path coefficients, as illustrated in Figure 1.

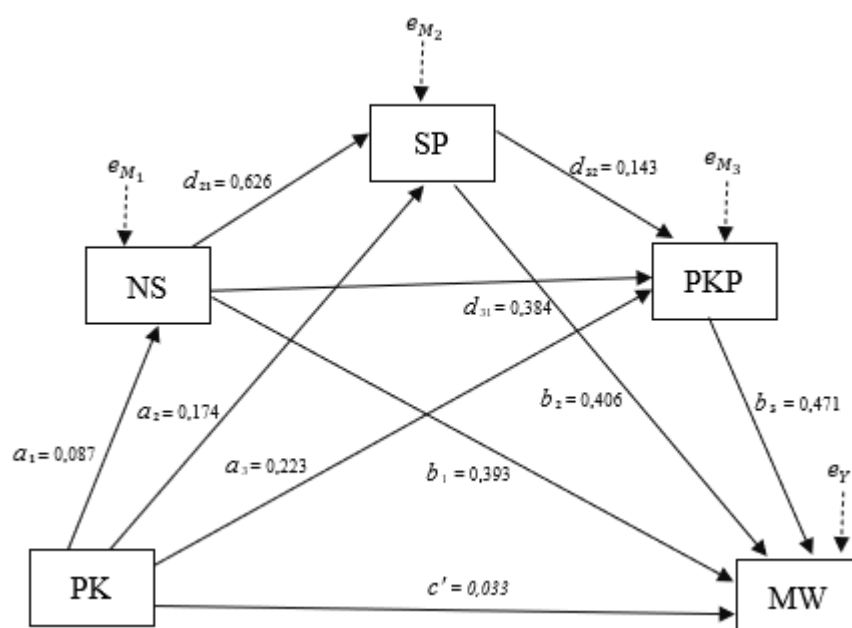


Figure 1. The results of the serial multiple mediation testing subjective norm, personal attitude, perceived behavioral control as mediators of the effect entrepreneurship knowledge on entrepreneurial intentions. N = 366. Standardized regression coefficients are shown. $p < 0,05$

The findings of this study contradict those of Cheng et al. (2009); Hattab (2014); Jones et al. (2008); Scuotto & Morellato (2013); Tshikovihi & Shambare (2015), who reported no significant relationship between entrepreneurial knowledge and entrepreneurial intentions. According to Cheng et al. (2009) and Alkhalaf et al. (2022), the non-significant effect of entrepreneurial knowledge on intentions may be attributed to ineffective teaching methods used in entrepreneurship education.

On the other hand, these findings also reinforce the results of Lorz (2011) and Miralles et al (2016), who demonstrated that entrepreneurial knowledge alone does not directly influence entrepreneurial intentions. Instead, the present study provides evidence that the effect of entrepreneurial knowledge on entrepreneurial intentions is fully mediated by subjective norms, personal attitudes, and perceived behavioral control.

The observed mediation effect may be explained by the process through which students integrate the entrepreneurial knowledge acquired at school with external experiences beyond the academic environment. These experiences may strengthen their

subjective norms, shape personal attitudes, and enhance perceived behavioral control, which collectively contribute to fostering entrepreneurial intentions among students.

From a theoretical standpoint, the mediation pathway involving subjective norms and personal attitudes suggests a sequential process in which entrepreneurial knowledge acquired by students initially fosters a mental drive conceptualized as subjective norms. This is reflected in the significant positive effect of entrepreneurial knowledge on subjective norms (path coefficient $a_1 = 0.087$).

Subsequently, the established subjective norms influence the formation of personal attitudes toward entrepreneurship. Liñán & Chen (2009) and Mohammed et al. (2017) posited that subjective norms emerge as a precursor to both personal attitudes and perceived behavioral control, as these constructs are often shaped by the internalized social expectations and normative beliefs held by the individual. Empirical findings from this study support this proposition, as subjective norms demonstrated a strong positive effect on personal attitudes ($b_{21} = 0.626$).

Perceived behavioral control, meanwhile, is theorized to develop through accumulated experiences, either via direct personal engagement or through observing others' entrepreneurial behaviors. These experiences contribute to the formation of individuals' beliefs regarding the ease or difficulty of performing entrepreneurial activities, thereby shaping their perceived behavioral control.

When the three mediating variables subjective norms, personal attitudes, and perceived behavioral control, were tested simultaneously in a serial mediation model, the overall mediation effect decreased, producing the smallest coefficient among all indirect effect pathways. This finding suggests that the serial mediation pathway provides a weaker explanatory mechanism compared to the individual, partial mediation effects of each variable.

One plausible explanation for this lies in the theoretical assumption that subjective norms serve as a foundational factor for shaping personal attitudes and perceived behavioral control (Liñán & Chen, 2009; Bazan, 2022). However, entrepreneurial knowledge may not directly reconstruct all three mediating variables simultaneously, as additional external factors, beyond the scope of this study, likely influence their development.

Interestingly, when the model isolated personal attitudes as the sole mediator, the indirect effect increased substantially. This indicates that entrepreneurial knowledge indirectly shapes individuals' evaluative judgments toward entrepreneurial activities. In line with (Liñán, 2004) and Emami, A., & Khajeheian (2018), entrepreneurial knowledge enhances individuals' understanding of prevailing social norms and value systems, thereby equipping them to better navigate potential environmental constraints or social pressures.

A subsequent model incorporating both personal attitudes and perceived behavioral control as mediators revealed that these variables jointly mediate the relationship between entrepreneurial knowledge and entrepreneurial intentions. This suggests that students' entrepreneurial knowledge unconsciously fosters more favorable evaluative judgments toward entrepreneurial behavior. The significant positive path coefficient from entrepreneurial knowledge to personal attitudes ($a_2 = 0.174$) further supports this interpretation.

Moreover, the positive influence of personal attitudes on perceived behavioral control aligns with the attitude theory proposed by Fishbein & Ajzen (1975) and Ajzen et al. (2018), which posits that favorable evaluations of a behavior (attitude toward behavior) contribute to individuals' confidence in their ability to perform that behavior, thereby shaping perceived behavioral control.

Finally, when perceived behavioral control was examined as the sole mediator, the model produced the largest indirect effect. This finding underscores the prominent role of entrepreneurial knowledge in shaping perceived behavioral control, as also indicated by (Peng et al., 2012). In practical terms, students who possess entrepreneurial knowledge, particularly knowledge related to entrepreneurial activities and instrumental steps required to start a business, are better equipped to assess whether such activities are perceived as easy or difficult to perform.

Conclusion

The results of the analysis indicate that entrepreneurial knowledge does not have a direct effect on entrepreneurial intentions. Instead, the influence of entrepreneurial knowledge on entrepreneurial intentions occurs indirectly through subjective norms, personal attitudes, and perceived behavioral control. Furthermore, among the mediating pathways examined, the largest indirect effect was observed through perceived behavioral control. In contrast, the smallest mediation effect was produced by the serial mediation pathway involving all three mediators simultaneously.

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