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EDUCATIONAL-PSYCHOLOGICAL DETERMINANTS OF ENTREPRENEURIAL MOTIVATION IN UNIVERSITY-LEVEL INNOVATION TRAINING

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Abstract:
Innovation and entrepreneurship education has been widely promoted in higher education as a means of cultivating students' innovative capabilities; however, the psychological mechanisms through which such education translates into behavioral outcomes remain insufficiently understood. This study examines the relationships between Innovation and Entrepreneurship Education (IEE), Entrepreneurial Knowledge, Entrepreneurial Attitude, and Innovative Behavior. Using survey data collected from 412 university students, this study employs descriptive analysis, correlation analysis, regression analysis, and regression-based mediation analysis to test the proposed relationships. The results indicate that Innovation and Entrepreneurship Education has a significant positive effect on students' entrepreneurial knowledge, entrepreneurial attitude, and innovative behavior. Furthermore, both entrepreneurial knowledge and entrepreneurial attitude partially mediate the relationship between Innovation and Entrepreneurship Education and innovative behavior, suggesting that educational interventions influence students' behavior through both cognitive and attitudinal pathways.
Keywords: Innovation and entrepreneurship education; entrepreneurial knowledge; entrepreneurial attitude; innovative behavior; educational psychology

1. INTRODUCTION

In the academic world, innovation and entrepreneurship education (IEE) has gained a lot of attention lately. Since 2016, entrepreneurship and innovation have emerged as the key components of talent development. Harvard Business School was the birthplace of the idea for IEE, and in 1947 the school launched an entrepreneurship course. Following that, IEE in higher education quickly gained international traction (Nabi et al., 2017). The goal of IEE is to develop students with creative problem-solving skills to satisfy societal demands and to challenge the status quo with a spirit of adventure, independence, and pioneering (Fayolle, 2013). In order to encourage entrepreneurial behaviour and intention, Ferreira and other academics stress the significance of entrepreneurship education (Ferreira and Pinheiro, 2018). According to García-Rodríguez et al. (2017), students' entrepreneurial attitudes and intentions are effectively influenced by entrepreneurship education (Anggadwita et al., 2017; García-Rodríguez et al., 2017). Additionally, studies have demonstrated that students' entrepreneurial mindset and intention are enhanced by innovation and entrepreneurship classes (Muscio et al., 2019; Gielnik et al., 2015).

Bird argued that entrepreneurship was a form of voluntary and planned behaviour, and he was the first to develop the idea of entrepreneurial intention (Bird, 1988). Entrepreneurial ambition is a reflection of people's drive to implement deliberate plans or choices. In order to gauge the level of entrepreneurial traits, Bagheri believed that entrepreneurial intention referred to a prospective entrepreneur's subjective attitude towards the choice to launch a firm (Bagheri and Pihie, 2015). According to Salamzadeh et al. (2013), entrepreneurial intention is merely a motive and may not result in the occurrence of entrepreneurial behaviour.

Nonetheless, entrepreneurial behaviour requires entrepreneurial intention, and those who have previously launched enterprises should use this as a reference (Qiao and Huang, 2019). Numerous studies have shown that entrepreneurial education and entrepreneurial intention are positively correlated (Kariv et al., 2019; Zhang et al., 2020).

According to another study, entrepreneurship education equips students with the knowledge and abilities necessary to launch a business and inspires them to pursue entrepreneurship as a career (Chen, 2019; Marlous et al., 2021). The three key components of this paper's purpose are as follows:

1. This paper's primary goal is to investigate how IEE affects college students' entrepreneurial intention using the planned behaviour theory and the assimilation learning theory of cognitive structure. The impact of IEE on entrepreneurial intention is currently the subject of numerous discussions, with varying outcomes. While some

study indicates that the impact of IEE on students' entrepreneurial intention is negligible or perhaps detrimental, other studies contend that it can encourage students' entrepreneurial intentions. The conclusions are not broadly applicable. This demonstrates that the precise function of IEE has not been well investigated.

2. This paper's second goal is to investigate how entrepreneurial attitude, inventive behaviour, and entrepreneurial knowledge mediate the relationship between students' entrepreneurial intention and IEE. So, is there a logical connection between IEE and the desire to start your own business? Can students' entrepreneurial intentions be effectively enhanced by IEE? Additionally, if there is a logical connection between them, what is the mechanism of action and how does it operate? Thus, it is necessary to confirm how IEE affects entrepreneurial purpose. Consequently, the article aims to demonstrate that specific innovative behaviour, innovation knowledge, and entrepreneurial mindset have a favourable and statistically significant link with the impact of IEE on entrepreneurial intention.

3. Enhancing and broadening the theoretical foundation of IEE and providing helpful recommendations for its development and application constitute the third goal of this research. According to earlier research, education has a significant role in developing innovative skills and an entrepreneurial mindset (Martin et al., 2013). This perspective has resulted in significant international investment in IEE, as evidenced by the sharp rise in university courses on innovation and entrepreneurship. Therefore, how can education best foster college students' entrepreneurial consciousness and innovative character? Following empirical testing, this article attempts to provide unbiased and rational recommendations.

2. METHOD

2.1 Research Design

This study adopted a quantitative, cross-sectional survey design to examine the relationships between educational interventions and students' psychological and behavioral outcomes. Drawing on educational psychology and behavioral intention theories, a structured questionnaire was used to collect self-reported data from university students. The research design aimed to test both direct effects and mediating mechanisms among the key variables through regression-based mediation analysis.

2.2 Participants and Data Collection

The participants were undergraduate and postgraduate students recruited from multiple universities. Prior to the formal data collection, a pilot study was conducted to ensure the clarity, reliability, and contextual appropriateness of the questionnaire items. Feedback from domain experts in education and psychology was incorporated to refine item wording and scale structure.

Data were collected using an online questionnaire distributed through institutional and student communication channels. Participation was voluntary and anonymous. To ensure data quality, responses with missing values, patterned answering, or unrealistically short completion times were excluded from the final dataset. After screening, the remaining valid responses were used for subsequent statistical analyses. Demographic variables such as gender, academic major, year of study, and educational level were collected and treated as control variables to account for potential background effects.

2.3 Measures

All constructs were measured using established scales adapted from prior studies, with minor contextual modifications to fit the educational setting of the present research.

2.3.1 Innovation and Entrepreneurship Education (IEE)

Innovation and entrepreneurship education was measured using a scale adapted from Franke and Lüthje (2003), which assesses students' perceptions of institutional support for innovation and entrepreneurship education. The scale captures multiple dimensions, including curriculum design, teaching resources, entrepreneurial guidance, and the availability of institutional support structures. This measure has been widely used to evaluate educational environments related to entrepreneurial learning.

2.3.2 Entrepreneurial Knowledge

Entrepreneurial knowledge was assessed based on the scale developed by Roxas and colleagues (2008), which focuses on students' perceived acquisition of entrepreneurial-related knowledge and skills. The items evaluate respondents' understanding of entrepreneurial processes, opportunity recognition, practical skills, and social resources required for starting a business. This scale reflects the cognitive dimension of entrepreneurship education outcomes.

2.3.3 Entrepreneurial Attitude

Entrepreneurial attitude was measured using items adapted from Pihie & Bagheri (2011). The scale evaluates individuals' affective and evaluative orientations toward entrepreneurship, including achievement motivation, personal success, social recognition, and perceived value of entrepreneurial activities. This construct represents the attitudinal component influencing behavioral intention.

2.3.4 Innovative Behavior

Innovative behavior was measured using the scale originally developed by Scott and Bruce (1995), which conceptualizes innovation as a multi-stage behavioral process. The items assess individuals' tendencies to generate novel ideas, promote these ideas, seek resources, and actively implement innovative solutions. This scale has been extensively validated in studies examining individual-level innovation behaviors.

2.4 Data Analysis

Pearson correlation analysis was conducted to examine the relationships among Innovation and Entrepreneurship Education, Entrepreneurial Knowledge, Entrepreneurial Attitude, and Innovative Behavior. To further test the relationships among the variables, multiple regression analyses were conducted. Innovation and Entrepreneurship Education (IEE) was entered as the independent variable, while Entrepreneurial Knowledge, Entrepreneurial Attitude, and Innovative Behavior were treated as dependent variables in separate regression models. Gender, academic major, and educational level were included as control variables in all models.

3. RESULTS

3.1 Descriptive Statistics

A total of 412 valid responses were included in the final analysis after data screening. Table 1 presents the demographic characteristics of the sample. Among the participants, 57.0% were female and 43.0% were male. In terms of academic background, students from science and engineering majors accounted for the largest proportion (55.6%), followed by economics and management (22.1%), humanities and social sciences (15.0%), and other majors (7.3%). With regard to educational level, the majority of respondents were undergraduate students (78.4%), while postgraduate students accounted for 21.6%. Overall, the sample demonstrated sufficient diversity in gender, academic background, and educational level, providing an adequate basis for subsequent statistical analyses.

Table 1. Demographic characteristics of the sample

Variable	Category	N/Mean±SD	Percentage (%)
Gender	Male	177	43.0
	Female	235	57.0
Academic major	Humanities & Social Sciences	62	15.0
	Economics & Management	91	22.1
	Science & Engineering	229	55.6
	30	7.3	
Educational level	Undergraduate	323	78.4
	Postgraduate	89	21.6
IEE		3.62	0.68
Entrepreneurial Knowledge		3.78	0.61
Entrepreneurial Attitude		3.55	0.72
Innovative Behavior		3.41	0.74

3.2 Reliability and Validity Analysis

The reliability and validity of the measurement instruments were examined prior to hypothesis testing. Cronbach's alpha coefficients were calculated to assess internal consistency reliability. As shown in Table 3, the Cronbach's alpha values for all constructs ranged from 0.89 to 0.94, exceeding the recommended threshold of 0.70, indicating satisfactory internal consistency. In addition, Kaiser–Meyer–Olkin (KMO) measures and Bartlett's tests of sphericity were conducted to examine sampling adequacy and factorability. The KMO values ranged from 0.86 to 0.92, and Bartlett's tests were all statistically significant ($p < 0.001$), suggesting that the data were suitable for factor analysis and that the constructs demonstrated adequate construct validity.

Table 3. Reliability and validity results

Construct	Cronbach's α	KMO	Bartlett's Test (p)
IEE	0.94	0.92	< 0.001
Entrepreneurial Knowledge	0.91	0.89	< 0.001
Entrepreneurial Attitude	0.89	0.86	< 0.001
Innovative Behavior	0.92	0.90	< 0.001

3.3 Correlation Analysis

Pearson correlation analysis was conducted to examine the bivariate relationships among the main variables. The correlation matrix is presented in Table 4. As shown in Table 4, Innovation and Entrepreneurship Education was positively and significantly correlated with Entrepreneurial Knowledge ($r = 0.67$, $p < 0.01$), Entrepreneurial Attitude ($r = 0.59$, $p < 0.01$), and Innovative Behavior ($r = 0.63$, $p < 0.01$). In addition, Entrepreneurial Knowledge and Entrepreneurial Attitude were both strongly correlated with Innovative Behavior ($r = 0.71$ and $r = 0.68$, respectively, $p < 0.01$). These results provide preliminary support for the hypothesized relationships and indicate that the variables are suitable for regression and mediation analyses.

Table 4. Correlation matrix

Variables	1	2	3	4
IEE	1			

Entrepreneurial Knowledge	0.67**	1		
Entrepreneurial Attitude	0.59**	0.64**	1	
Innovative Behavior	0.63**	0.71**	0.68**	1

3.4 Regression Analysis

Multiple regression analyses were conducted to examine the effects of Innovation and Entrepreneurship Education on Entrepreneurial Knowledge, Entrepreneurial Attitude, and Innovative Behavior. The results are summarized in Table 5. Innovation and Entrepreneurship Education showed a significant positive effect on Entrepreneurial Knowledge ($\beta = 0.69$, $p < 0.001$) and Entrepreneurial Attitude ($\beta = 0.58$, $p < 0.001$). In addition, Innovation and Entrepreneurship Education significantly predicted Innovative Behavior ($\beta = 0.62$, $p < 0.001$). When Entrepreneurial Knowledge was included in the regression model predicting Innovative Behavior, the coefficient of Innovation and Entrepreneurship Education decreased but remained statistically significant, indicating a partial mediating effect of Entrepreneurial Knowledge. A similar pattern was observed when Entrepreneurial Attitude was introduced as a mediator. These results suggest that Innovation and Entrepreneurship Education influences students' innovative behavior both directly and indirectly through cognitive and attitudinal pathways.

Table 5. Regression and mediation analysis results

Predictor	**Dependent variable: Knowledge**	**Attitude**	**Innovative Behavior**	**Innovative Behavior (with Knowledge)**	**Innovative Behavior (with Attitude)**
IEE	0.69***	0.58***	0.62***	0.31***	0.38***
Entrepreneurial Knowledge	—	—	—	0.45***	—
Entrepreneurial Attitude	—	—	—	—	0.32***
R^2	0.48	0.37	0.42	0.56	0.51

4. DISCUSSION

The results indicate that Innovation and Entrepreneurship Education has a significant positive effect on Entrepreneurial Knowledge, Entrepreneurial Attitude, and Innovative Behavior. This finding is consistent with prior research suggesting that entrepreneurship-oriented education enhances students' innovation-related competencies and behavioral engagement. From an educational psychology perspective, structured educational interventions provide students with opportunities to integrate new knowledge with existing cognitive frameworks, thereby facilitating meaningful learning and behavioral transformation.

Furthermore, the results show that Entrepreneurial Knowledge and Entrepreneurial Attitude are both positively associated with Innovative Behavior. Students who possess higher levels of entrepreneurship-related knowledge and hold more positive attitudes toward innovation are more likely to engage in proactive and creative behaviors. This finding supports the view that innovative behavior is not solely driven by external educational input, but also depends on internal cognitive and attitudinal factors ((Ljumović et al., 2019).

More importantly, the mediation analyses reveal that Entrepreneurial Knowledge and Entrepreneurial Attitude partially mediate the relationship between Innovation and Entrepreneurship Education and Innovative Behavior. This suggests that innovation and entrepreneurship education influences students' innovative behavior through multiple pathways. On the one hand, education enhances students' cognitive understanding of entrepreneurship, which in turn promotes innovative action (Palalic et al., 2016; Halvari et al., 2019). On the other hand, education shapes students' evaluative orientations toward innovation, thereby increasing their willingness to engage in innovative activities. The persistence of a direct effect of Innovation and Entrepreneurship Education further indicates that educational environments may exert additional influences beyond individual psychological mechanisms.

5. CONCLUSION

This study investigated the role of Innovation and Entrepreneurship Education in shaping students' innovative behavior by examining the cognitive and attitudinal mechanisms underlying this relationship. Drawing on perspectives from educational psychology, the findings demonstrate that innovation and entrepreneurship education not only directly promotes innovative behavior, but also exerts indirect effects through the enhancement of entrepreneurial knowledge and the development of positive entrepreneurial attitudes.

By identifying these dual pathways, this study contributes to a more nuanced understanding of how educational interventions translate into behavioral outcomes. The results underscore the importance of designing innovation-oriented educational programs that integrate knowledge acquisition with attitudinal development, while also fostering supportive learning environments that encourage active engagement.

This study provides empirical evidence supporting the effectiveness of innovation and entrepreneurship education in higher education and offers practical insights for educators and policymakers seeking to cultivate students' innovative capacities through psychologically informed educational practices.

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