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ENTREPRENEURIAL INTENTIONS OF VOCATIONAL COLLEGE STUDENTS: THE ROLE OF INNOVATION EDUCATION AND INITIATIVE PERSONALITY

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Abstract:
The rapid shift toward a knowledge-based economy highlights the importance of entrepreneurship and innovation in higher education. This study investigates how innovation and entrepreneurship education and students' initiative personality influence entrepreneurial intentions, while also examining the role of demographic characteristics such as age, gender, and family income. A quantitative survey was administered to 750 higher vocational college students, and the data were analyzed using descriptive statistics, t-tests, ANOVA, and multiple linear regression. Results indicate that both innovation and entrepreneurship education ($\beta = 0.322$, $p < 0.01$) and initiative personality ($\beta = 0.559$, $p < 0.01$) significantly and positively affect entrepreneurial intentions, with initiative personality having a more substantial effect. Demographic factors, including age, gender, and household income, also significantly differentiate entrepreneurial intentions. This study contributes by integrating educational and personality perspectives to explain entrepreneurial intentions in vocational students. Findings suggest that enhancing entrepreneurship curricula while fostering proactive traits can effectively strengthen students' entrepreneurial motivation and practical readiness.

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INTRODUCTION

Rapid urbanization and the transition to a knowledge-based economy have fundamentally transformed labor-market demands, placing innovation and entrepreneurship at the core of sustainable economic development. Societies increasingly require individuals who are not only job seekers but also job creators, capable of generating economic value and social solutions (Juhari, Ismail, Roslan, & Zaremohzzabieh, 2023; Luo, Huang, & Gao, 2022; Ng, Hung Kee, & Khan, 2021). Innovation-driven entrepreneurship has been widely recognized as a strategic engine for financial resilience, urban competitiveness, and industrial transformation. Empirical evidence shows that entrepreneurial activities contribute significantly to employment creation, technological advancement, and social mobility, particularly among young people (Awwad, 2021; Duong, 2022; Fu et al., 2022). In response, higher education institutions are expected to play a critical role in cultivating entrepreneurial mindsets and innovative capabilities. This expectation is particularly relevant for higher vocational colleges, which are designed to prepare practice-oriented graduates (Cunha, Ferreira, Araújo, & Nunes, 2022; Martins, Shahzad, & Xu, 2023). Therefore, understanding the determinants of entrepreneurial intentions among vocational students is crucial, as it directly affects workforce quality, economic inclusiveness, and long-term societal development.

Despite growing recognition of entrepreneurship as a solution to youth unemployment and economic stagnation, many societies continue to face a gap between educational outcomes and labor-market needs. Higher vocational college graduates, although equipped with technical skills, often exhibit low entrepreneurial intentions and limited readiness to initiate independent ventures (Cao, 2022; Fu et al., 2022). This condition reflects a broader societal problem where education systems emphasize skill acquisition but insufficiently foster innovation, risk-taking, and entrepreneurial initiative. Governments have introduced innovation and entrepreneurship education as a policy response; however, its effectiveness remains inconsistent across institutions. Moreover, personality-related factors, such as initiative, which reflects proactivity, persistence, and self-starting behavior, are often overlooked in educational design (Anjum et al., 2023; Dwi et al., 2022; Gao, 2022). As a result, students may complete entrepreneurship courses without developing genuine entrepreneurial motivation. This mismatch between policy aspirations and actual student outcomes underscores the need to examine how educational interventions and individual characteristics interact to shape entrepreneurial intentions, particularly in vocational education contexts.

In practical settings, higher vocational colleges have actively implemented innovation and entrepreneurship programs through curriculum integration, business simulations, start-up competitions, and incubator-based learning. However, field observations reveal that student participation often remains superficial, with entrepreneurial activities treated as academic requirements rather than personal aspirations. Many students prefer stable employment over entrepreneurial risk, even after completing entrepreneurship-related courses (Ahmid, Chun, & Abdullah, 2023; Maziriri, Nyagadza, & Chuchu, 2023). Interviews and institutional reports indicate that while innovation and entrepreneurship education increase awareness, it does not always translate into entrepreneurial intention at the firm level. This phenomenon suggests that formal instruction alone may be insufficient to stimulate entrepreneurial behavior. Students' psychological readiness, especially their initiative personality, appears to play a decisive role in determining whether educational exposure leads to entrepreneurial intention (Barba-Sánchez et al., 2022; Biswas, 2021; Mohamed et al., 2023). Consequently, the real-world phenomenon highlights a critical disconnect between program implementation and behavioral outcomes, emphasizing the importance of examining both educational factors and individual personality traits in shaping vocational students' entrepreneurial intentions.

Previous studies have extensively examined entrepreneurship education and entrepreneurial intention. Iddris (2025) and Nunfam et al. (2022) found that entrepreneurship education positively influences students' entrepreneurial attitudes, while Huang (2024) and Jiang et al. (2022) emphasized the mediating role of entrepreneurial self-efficacy. Similarly, Li et al. (2022), Qazi et al. (2020), and Sarwar et al. (2023) demonstrated that curriculum integration enhances entrepreneurial awareness, and Cao et al. highlighted the role of innovation education in shaping vocational students' career choices. Although these studies confirm the importance of educational factors, most focus on general higher education contexts and treat students as homogeneous groups. Few studies integrate personality dimensions, particularly initiative, into the analysis, particularly in higher vocational education. Moreover, prior research often examines education and personality variables separately, neglecting their combined impact. This fragmented approach leaves a critical research gap regarding how

innovation and entrepreneurship education interact with initiative personality to influence entrepreneurial intentions among vocational college students, a gap that remains underexplored both theoretically and empirically.

This study offers a novel contribution by integrating innovation and entrepreneurship education with initiative personality within a unified analytical framework to explain entrepreneurial intentions among higher vocational college students. Unlike prior studies that focus solely on educational content or psychological traits, this research adopts a holistic perspective that captures both institutional and individual determinants. The state-of-the-art contribution lies in positioning initiative personality not merely as a background trait but as a key explanatory variable that moderates the effectiveness of entrepreneurship education. Additionally, by focusing on higher vocational colleges, this study addresses a population that has been underrepresented in entrepreneurship research despite its strategic importance for applied talent Development. The findings are expected to advance theoretical understanding by bridging education policy, personality psychology, and models of entrepreneurial intention, while also offering practical insights for designing more effective entrepreneurship education tailored to the characteristics of vocational students.

Based on the above discussion, this study seeks to address the following research problem: how do innovation and entrepreneurship education and initiative personality influence the entrepreneurial intentions of higher vocational college students? The central argument of this study is that entrepreneurship education alone is insufficient to foster strong entrepreneurial intentions unless supported by students' initiative personality. It is hypothesized that innovation and entrepreneurship education positively affect entrepreneurial intention, and higher levels of initiative personality strengthen this effect. The originality of this research lies in its integrative approach, which combines educational and personality perspectives to explain entrepreneurial intention in vocational education. The study contributes theoretically by extending entrepreneurial intention models to include initiative personality as a key factor, and practically by providing evidence-based recommendations for policymakers and educators to design entrepreneurship education that is both pedagogically effective and psychologically responsive.

RESEARCH METHODS

This study employed a quantitative research design, using a cross-sectional survey, to examine the impact of innovation and entrepreneurship education and initiative personality on the entrepreneurial intentions of higher vocational college students. The quantitative approach was selected because it allows for objective measurement of relationships among variables and enables statistical testing of hypotheses based on empirical data (Nielbo et al., 2024; Waruwu, 2023). This design is appropriate for identifying patterns, strengths, and directions of influence between educational and psychological factors and entrepreneurial intention, thereby supporting generalizable conclusions across a large student population.

The research was conducted at higher vocational colleges in China during the 2023–2024 academic year. China was selected as the research location due to its strong national emphasis on innovation-driven Development and the strategic role of vocational education in cultivating applied entrepreneurial talent. The study population consisted of

students enrolled in higher vocational colleges who had participated in innovation and entrepreneurship-related courses. A simple random sampling technique was employed to ensure equal selection probability for each student. Using the Yamane formula with a 95% confidence level and a 5% margin of error, a total population of approximately 3,750 students yielded a sample of 750 respondents, corresponding to a sampling rate of 20%.

Data were collected using a structured questionnaire based on established, validated measurement scales from previous studies (Wang et al., 2024). The questionnaire consisted of four sections: (1) demographic information (gender, age, place of residence, and annual family income), (2) innovation and entrepreneurship education, (3) initiative personality, and (4) entrepreneurial intention. Items were measured using a five-point Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Before the primary survey, a pilot test was conducted to ensure clarity, reliability, and construct validity of the instrument. The questionnaire was administered to selected students both online and offline with the assistance of academic staff at participating institutions. Respondents were informed about the research objectives, assured of anonymity and confidentiality, and asked to provide voluntary consent before completing the survey. The data collection process lasted two months to ensure sufficient response rates and data completeness. Incomplete or invalid responses were excluded from further analysis to maintain data quality.

Quantitative data were analyzed using the Statistical Package for the Social Sciences (SPSS) (Luoma, 2024). Descriptive statistics were used to summarize respondents' demographic characteristics and the distributions of variables. Reliability was assessed using Cronbach's alpha to evaluate internal consistency. Inferential analyses, including correlation and multiple regression analyses, were employed to examine the effects of innovation and entrepreneurship education, and initiative personality, on entrepreneurial intention. Statistical significance was determined at the 0.05 level. To ensure research validity and reliability, several procedures were implemented. Content validity was established through expert review and alignment with existing literature. Construct validity was assessed using factor analysis. Reliability was confirmed through Cronbach's alpha coefficients exceeding the acceptable threshold of 0.70. These procedures ensured that the research instruments were both valid and reliable, thereby enhancing the credibility and robustness of the study findings.

RESULTS AND DISCUSSION

Results

This section presents the research findings on the entrepreneurial intentions of higher vocational college students. It begins with descriptive statistics summarizing respondents' demographic characteristics, followed by inferential analyses examining differences across gender, age, residence, income, school year, and significance. Finally, the influence of innovation and entrepreneurship education and initiative personality on entrepreneurial intention is analyzed using multiple linear regression.

Descriptive Statistics

This section presents a general overview of respondents' characteristics using descriptive statistics, specifically frequency analysis. The data in Table 1 show that, among the 750 respondents, the gender composition is relatively balanced between men and women, with a predominance of 19–20-year-olds, reflecting a cohort of active students

at the early to middle stages of their careers. The majority of respondents came from urban areas and had middle-income household backgrounds, indicating a fairly representative socioeconomic condition. By year of study, most respondents were in their second or third year; by study program, business/management and engineering/technology accounted for the majority of the research sample. Overall, these respondent characteristics demonstrate adequate demographic diversity and support the feasibility of the data as a basis for quantitative analysis in the next stage.

Table 1. Frequency Analysis Results

1. Gender:	Frequency	Percent
Male	388	51.73
Female	362	48.27
Total	750	100.0
2. Age	**Frequency**	**Percent**
18 years old or below	56	7.47
19 years old	290	38.67
20 years old	232	30.93
21 years old	141	18.80
22 years old or above	31	4.13
Total	750	100.0
3. Place of Residence	**Frequency**	**Percent**
City	513	68.40
Village	237	31.60
Total	750	100.0
4. Annual Household Income	**Frequency**	**Percent**
Low Income	110	14.67
Middle Income	563	75.07
High Income	77	10.27
Total	750	100.0
5. School Year	**Frequency**	**Percent**
First Year	61	8.13
Second Year	378	50.40
Third Year	256	34.13
Fourth Year or Above	55	7.33
Total	750	100.0
6. Major	**Frequency**	**Percent**
Engineering/Technology	253	33.73
Business/Management	322	42.93
Arts/Humanities	139	18.53
Health Sciences	36	4.80
Total	750	100.0

Table 1 shows the frequency distribution of demographic factors. From the Table, it can be seen that the total sample size of this article is 750. Among the 750 respondents who received the questionnaire, 388 were male (51.73%), and 362 were female (48.27%). In terms of age distribution, 7.47% of the respondents are aged 18 and below, 38.67% are aged 19, accounting for the most significant proportion, 30.93% are aged 20, 18.8% are aged 21, and only 4.13% are aged 22 and above; From the distribution of residential areas, 513 respondents came from cities, accounting for 68.4%, and 237 respondents

came from rural areas, accounting for 31.6%; In terms of annual household income, 75.07% of the respondents have a moderate level of household income; From the distribution of academic years, more than half of the respondents are in their second year of college; In terms of professional distribution, 33.73% of respondents come from engineering/technology majors, 42.93% from business/management majors, 18.53% from arts/humanities majors, and the rest from health science majors.

Table 2. Descriptive Statistical Analysis Results of Demographic Factors

Items	N	Min	Max	Mean	SD	Medium
Gender	750	1.000	2.000	1.483	0.500	1.000
Age	750	1.000	5.000	2.735	0.985	3.000
Place of Residence	750	1.000	2.000	1.316	0.465	1.000
Family Annual Income	750	1.000	3.000	1.956	0.498	2.000
School Year	750	1.000	4.000	2.407	0.743	2.000
Major	750	1.000	4.000	1.944	0.844	2.000
How do you rate your overall financial knowledge?	750	1.000	5.000	2.420	1.035	2.000
How important do you consider entrepreneurship as a career option?	750	1.000	2.000	1.715	0.452	2.000
How often do you access information related to entrepreneurship or business start-ups?	750	1.000	5.000	3.168	1.068	3.000

Table 2 presents descriptive statistics for demographic factors. The Table shows that the sample size is 750, with a minimum gender value of 1 and a maximum gender value of 2. The mean is 1.483 and the standard deviation is 0.5, indicating that the gender distribution of the respondents is more male than female, and the overall fluctuation of the data is relatively small; The average age is 2.735, indicating that the majority of respondents are aged 20 and above; The average distribution of residential areas is 1.316, with a standard deviation of 0.465, indicating that the majority of respondents come from cities and the data is generally evenly distributed; The average annual household income is 1.956, with a median of 1 and a standard deviation of 0.498, indicating that the majority of respondents' household income levels are above average, and the overall fluctuation of the data is relatively small; The average annual value is 2.407, the standard deviation is 0.743, and the median is 2, indicating that most of the respondents are in their second year of college; The average distribution of majors is 1.944, indicating that the majority of majors are engineering technology or business management; From the perspectives of financial knowledge reserve, attitude towards entrepreneurial choices, and whether to take action for entrepreneurship, the overall attitude of the respondents towards entrepreneurship is positive and willing to take action for it.

Inferential Statistics

This section presents inferential statistics using an independent-samples t-test to analyze differences in entrepreneurial intentions by gender. The analysis shows a significant difference between male and female respondents, with female respondents reporting higher average entrepreneurial intentions than male respondents ($p < 0.01$). This finding indicates that gender differentiates respondents' entrepreneurial intentions in this study.

Table 3. The Independent Samples t-test of the Gender Factor

Item	Gender (Mean ± Standard Deviation)		*t*	*p*
	Male(*n*=388)	Female(*n*=362)		
Entrepreneurial Intention	2.66±0.79	3.73±0.77	-18.927	0.000**

* *p*<0.05 ** *p*<0.01

Table 3 shows significant differences in entrepreneurial intentions across gender groups. Specific analysis shows that gender significantly affects entrepreneurial intentio n at the 0.01 level (t = -18.927, p = 0.000). Specifically, the average value for males (2.6 6) is considerably lower than that for females (3.73). As shown in Table 4, when the t-tes t was significant (p < 0.05), the effect size (Cohen's d = 1.383) exceeded 0.80, indicating a larger difference for the gender variable.

Table 4. Depth Analysis - Effect Size Indicator Table

Item	S2pooled (Joint Variance)	Cohen's *d* Value
Entrepreneurial Intention	0.609	1.383

Based on Table 4, the depth analysis using the effect size indicator shows that for entrepreneurial intention, the pooled variance (S^2pooled) is 0.609 and the Cohen's d value is 1.383. A Cohen's d value greater than 1.0 indicates a substantial effect, meaning that the difference in entrepreneurial intention between male and female groups is not only statistically significant but also has a substantial practical impact.

Table 5. The One-way ANOVA of Age

Item	Age (Mean ± Standard Deviation)					*F*	*p*
	18 years (*n*=56)	19 years (*n*=290)	20 years (*n*=232)	21 years (*n*=141)	22 years (*n*=31)		
Entrepreneurial Intention	2.92±1.03	2.78±0.81	3.28±0.95	3.66±0.79	4.35±0.20	43.252	0.000**

* *p*<0.05 ** *p*<0.01

Table 5 shows that all age groups exhibit significant differences in entrepreneurial intention (p < 0.05), indicating differences across age groups. It can be concluded that there are substantial differences in entrepreneurial intention across age groups. Post-inspection analysis is required.

Table 6. Multiple Comparisons of Age

Item	(I)Age	(J)Age	(I)Mean	(J)Mean	Difference(I-J)	*p*
Entrepreneurial Intention	18 years old	19 years old	2.915	2.783	0.132	0.290
	18 years old	20 years old	2.915	3.277	-0.362	0.005**
	18 years old	21 years old	2.915	3.664	-0.748	0.000**
	18 years old	22 years old	2.915	4.346	-1.431	0.000**
	19 years old	20 years old	2.783	3.277	-0.494	0.000**
	19 years old	21 years old	2.783	3.664	-0.881	0.000**
	19 years old	22 years old	2.783	4.346	-1.563	0.000**

Item	(I)Age	(J)Age	(I)Mean	(J)Mean	Difference(I-J)	*p*
	20 years old	21 years old	3.277	3.664	-0.387	0.000**
	20 years old	22 years old	3.277	4.346	-1.069	0.000**
	21 years old	22 years old	3.664	4.346	-0.682	0.000**

* $p<0.05$ ** $p<0.01$

Based on Table 6, the multiple-comparison analysis indicates differences in entrepreneurial intentions across age groups. The results suggest that most differences across age groups are statistically significant ($p < 0.01$), particularly between the younger (18–19 years) and older (20–22 years) groups, for which entrepreneurial intentions tend to increase with age. The only non-significant difference is between ages 18 and 19 ($p = 0.290$), indicating that intentions in these two early age groups are relatively similar. This finding confirms that age differentiates levels of entrepreneurial intention among respondents. The above variance analysis revealed significant differences in entrepreneurial intention across age groups. Specifically, LSD method analysis showed that age had a significant effect on entrepreneurial intention at the 0.01 level ($F=43.252$, $p=0.000$).

Table 7. The Independent Samples t-test on the Place of Residence Factor

Item	Place of Residence (Mean ± Standard Deviation)		*t*	*p*
	City(*n*=513)	Rural(*n*=237)		
Entrepreneurial Intention	2.90±0.89	3.77±0.78	-13.584	0.000**

* $p<0.05$ ** $p<0.01$

Table 7 shows that, using a t-test (independent-samples t-test), there are signific ant differences in entrepreneurial intention across residential areas. As shown in Table 8, when the t-test indicated a significant difference ($p < 0.05$), the effect size (Cohen's d = 0.961) exceeded 0.80, indicating that the greater the difference in regional variable ex pression, the larger the effect size.

Table 8. Depth Analysis - Effect Size Indicator Table

Item	S2pooled(Joint Variance)	Cohen's *d* Value
Entrepreneurial Intention	0.733	0.961

Based on Table 8, the depth analysis using the effect size indicator indicates that for entrepreneurial intention, the pooled variance (S^2pooled) is 0.733 and Cohen's d is 0.961. This shows a large effect size, suggesting that the difference in entrepreneurial intention between urban and rural respondents is not only statistically significant but also practically meaningful.

Table 9. The One-way ANOVA of Annual Household Income

Item	Annual Household Income (Mean ± Standard Deviation)			*F*	*p*
	Low(*n*=110)	Middle(*n*=563)	High(*n*=77)		
Entrepreneurial Intention	2.23±0.57	3.23±0.90	4.10±0.43	121.717	0.000**

* $p<0.05$ ** $p<0.01$

Based on Table 9, the one-way ANOVA was conducted to examine differences in entrepreneurial intention across annual household income groups. The results show that respondents from low-income households had a mean entrepreneurial intention of 2.23 (SD = 0.57), middle-income respondents scored 3.23 (SD = 0.90), and high-income respondents scored 4.10 (SD = 0.43). The F-value of 121.717 with p = 0.000 (p < 0.01) indicates that these differences are highly statistically significant. This suggests that household income strongly influences entrepreneurial intention, with higher-income respondents exhibiting greater entrepreneurial intention.

Table 10. Multiple Comparisons of Annual Household Income

Item	(I)Annual Household Income	(J)Annual Household Income	(I)Mean	(J)Mean	Differences(I-J)	*p*
Entrepreneurial Intention	Low	Middle	2.230	3.235	-1.005	0.000**
	Low	High	2.230	4.096	-1.866	0.000**
	Middle	High	3.235	4.096	-0.861	0.000**

* *p*<0.05 ** *p*<0.01

The analysis of variance in Table 10 shows significant differences in entrepreneurial intention among samples with different annual incomes. Specifically, the LSD method shows a significant correlation (p=0.01) between yearly income and entrepreneurial intention (F=121.717). The comparison results for the average scores, with important differences, are “Middle>Low; High>Low; High>Middle”.

Table 11. The One-way ANOVA of School Year

Item	School Year (Mean ± Standard Deviation)				*F*	*p*
	First Year (*n*=61)	Second Year (*n*=378)	Third Year (*n*=256)	Fourth Year (*n*=55)		
Entrepreneurial Intention	3.01±0.80	2.88±0.92	3.53±0.90	3.74±0.73	35.570	0.000**

* *p*<0.05 ** *p*<0.01

Based on Table 11, the one-way ANOVA was conducted to assess differences in entrepreneurial intention across school years. The mean entrepreneurial intention increases with school level: first-year students scored 3.01 (SD = 0.80), second-year students 2.88 (SD = 0.92), third-year students 3.53 (SD = 0.90), and fourth-year or above students 3.74 (SD = 0.73). The F-value of 35.570 with p = 0.000 (p < 0.01) indicates that these differences are statistically significant. This suggests that students’ entrepreneurial intention tends to increase as they progress through their academic years.

Table 12. Multiple Comparisons of School Year

Item	(I)School Year	(J)School Year	(I)Mean	(J)Mean	Differences(I-J)	*p*
Entrepreneurial Intention	First Year	Second Year	3.008	2.881	0.127	0.302
	First Year	Third Year	3.008	3.530	-0.522	0.000**
	First Year	Fourth Year	3.008	3.742	-0.734	0.000**
	Second Year	Third Year	2.881	3.530	-0.649	0.000**

Item	(I)School Year	(J)School Year	(I)Mean	(J)Mean	Differences(I-J)	*p*
	Second Year	Fourth Year	2.881	3.742	-0.861	0.000**
	Third Year	Fourth Year	3.530	3.742	-0.212	0.109

* $p<0.05$ ** $p<0.01$

Analysis of variance revealed significant differences in entrepreneurial intention across samples from different academic years. Specifically, the LSD method was used to obtain a 0.01 level significance (F=35.570, p=0.000) for entrepreneurial intention in educational years. After comparing the group-average values with significant differences, the results were: "Third Year>First Year; Fourth Year>First Year; Third Year>Second Year; Fourth Year>Second Year."

Table 13. The One-way ANOVA of Major

Item	Major (Mean ± Standard Deviation)				*F*	*p*
	Engineering/ Technology (*n*=253)	Business/ Management (*n*=322)	Arts/ Humanities (*n*=139)	Health Sciences (*n*=36)		
Entrepreneurial Intention	2.65±0.72	3.26±0.98	3.84±0.78	3.54±0.53	65.470	0.000**

* $p<0.05$ ** $p<0.01$

Based on Table 13, the one-way ANOVA shows significant differences in entrepreneurial intention across majors (F = 65.470, p = 0.000). Arts/Humanities and Health Sciences students exhibit a higher intention than Engineering/Technology and Business/Management students.

Table 14. Multiple Comparisons of Major

Item	(I)Major	(J)Major	(I)Mean	(J)Mean	Differences(I-J)	*p*
Entrepreneurial Intention	Engineering/ Technology	Business/ Management	2.646	3.263	-0.616	0.000**
	Engineering/ Technology	Arts/ Humanities	2.646	3.845	-1.198	0.000**
	Engineering/ Technology	Health Sciences	2.646	3.543	-0.896	0.000**
	Business/ Management	Arts/ Humanities	3.263	3.845	-0.582	0.000**
	Business/ Management	Health Sciences	3.263	3.543	-0.280	0.060
	Arts/ Humanities	Health Sciences	3.845	3.543	0.302	0.056

* $p<0.05$ ** $p<0.01$

Post hoc comparisons revealed significant differences in entrepreneurial intention across majors (see Table 14). Specifically, the LSD method was used to show that the majors showed a 0.01 level significance (F=65.470, p=0.000) in entrepreneurial intention. The average scores of groups with significant differences were compared as "Business/Management > Engineering/Technology; Arts/Humanities> Engineering/Technology; Health Sciences > Engineering/Technology; Arts/Humanities> Business/Management".

Innovation and Entrepreneurship Education Influenced by Entrepreneurial Intention

This section examines how innovation and entrepreneurship education affect entrepreneurial intention, to understand the extent to which educational exposure and learning experiences can shape students' motivation and readiness to engage in entrepreneurial activities.

Multiple linear regression analysis is applied in this study

This study employs multiple linear regression to examine the effects of innovation and entrepreneurship education on entrepreneurial intention. This method enables the precise, measurable assessment of the strength and direction of the relationship between students' exposure to such education and their entrepreneurial intention.

$$Y = \beta_0 + \beta_1 X$$

Where Y = Entrepreneurial Intention

X = Innovation and Entrepreneurship Education

Table 15. Multiple Linear Regression Analysis of Innovation and Entrepreneurship Education Influencing Entrepreneurial Intention (n=750)

	Unstandardized Coefficients		Standardized Coefficients Beta	*t*	*p*	Collinearity Diagnosis	
	B	Standard Error	*Beta*			VIF	Tolerance
Constant	1.971	0.124	-	15.920	0.000**	-	-
Innovation and Entrepreneurship Education	0.322	0.032	0.346	10.092	0.000**	1.000	1.000
R^2				0.120			
Adjust R^2				0.119			
F				*F* (1,748)=101.847,*p*=0.000			
D-W Value				1.909			

Dependent Variable： Entrepreneurial Intention

* $p<0.05$ ** $p<0.01$

Table 15 shows that, in a linear regression analysis with entrepreneurship and innovation education as the independent variables and entrepreneurship intention as the dependent variable, the model formula is: Entrepreneurship Intention = 1.971 + 0.322* Entrepreneurship and Innovation Education. The R-squared value for the model is 0.120, indicating that entrepreneurship and innovation education account for 12.0% of the variance in entrepreneurial intention. Summary analysis shows that all entrepreneurship and innovation education will have a significant positive impact on entrepreneurial intention. This proves the H1 of this article.

Initiative Personality Influenced on Entrepreneurial Intention

This section examines how initiative personality influences entrepreneurial intention, focusing on the role of proactive and self-starting traits in shaping students' motivation toward entrepreneurship.

The Multiple Linear Regression Analysis is applied in this study

This study uses multiple linear regression to examine the relationship between the

independent and dependent variables, enabling a precise assessment of how changes in the predictor variable affect entrepreneurial intention.

$$Y = \beta_0 + \beta_1 X$$

Y = Entrepreneurial Intention

X = Initiative Personality

Table 16. Multiple Linear Regression Analysis of Initiative Personality Influencing Entrepreneurial Intention (n=750)

	Unstandardized Coefficients		Standardized Coefficients Beta	*t*	*p*	Collinearity Diagnosis	
	B	Standard Error	*Beta*			VIF	Tolerance
Constant	1.124	0.117	-	9.632	0.000**	-	-
Initiative Personality	0.559	0.031	0.553	18.142	0.000**	1.000	1.000
R^2			0.306				
Adjust R^2			0.305				
F			*F* (1,748) =329.125, *p*=0.000				
D-W Value			1.515				

Dependent Variable： Entrepreneurial Intention

* *p*<0.05 ** *p*<0.01

Table 16 shows that, in a linear regression analysis with proactive personality as the independent variable and entrepreneurial intention as the dependent variable, the model formula is entrepreneurial intention = 1.124 + 0.559 * proactive personality. The R-squared value of the model is 0.306, indicating that proactive personality accounts for 30.6% of the variance in entrepreneurial intention: a one-percentage-point change in proactive personality corresponds to a 30.6-percentage-point change in entrepreneurial intention. A summary analysis indicates that a proactive personality has a significant positive effect on entrepreneurial intention, thereby supporting the second research hypothesis of this article.

DISCUSSION

The Influence of Demographic Variables on Entrepreneurial Intention: Demographic factors such as age, gender, and socioeconomic background influence entrepreneurial intention, though to varying degrees. Students from certain demographic groups showed higher entrepreneurial intentions due to access to resources or exposure to entrepreneurial environments. Research on demographic factors has found that female students are more likely to be stimulated by their entrepreneurial awareness (Al-Ghazali, Shah, & Sohail, 2022; Gupta, 2021). Older students, students in rural areas, students with higher annual family incomes, students in their junior and senior years, and students majoring in arts/humanities have higher entrepreneurial awareness.

The Impact of Innovation and Entrepreneurship Education on Entrepreneurial Intention: The results revealed that structured innovation and entrepreneurship education positively impacted entrepreneurial intention. Vocational college students who received formal training in entrepreneurship were more likely to have a strong entrepreneurial mindset and were more motivated to start their ventures (Pinto Borges,

Lopes, Carvalho, Vieira, & Lopes, 2021; Ratnamiasih, Nusantara, & Dewi, 2024). The Effect of Proactive Personality Traits on Entrepreneurial Intention: Proactive personality traits, including initiative, risk-taking, and persistence, significantly influence entrepreneurial intention. Students with proactive personalities were likelier to engage in entrepreneurial activities, suggesting that personality plays a crucial role in shaping entrepreneurial aspirations (Adnan et al., 2025; Biswas, 2022). The final choice of major is closely related to entrepreneurial awareness. Art and humanities students typically possess strong innovative thinking, cultural understanding, and communication skills, which enable them to address challenges in the entrepreneurial process more effectively and to identify entrepreneurial opportunities in the creative and cultural industries more readily (Amofah, 2022; Ojeleye et al., 2023). Therefore, students in these majors have a strong sense of entrepreneurship.

In relation to existing literature, these findings support previous research emphasizing the importance of personal traits and educational influences on entrepreneurial intention. Specifically, the positive correlation between innovation education and entrepreneurial intention aligns with the work of scholars such as García-Uceda et al. (2022) and Perez et al. (2024), who highlighted the importance of entrepreneurship training in fostering entrepreneurial intentions. Similarly, the impact of proactive personality traits on entrepreneurial intention is consistent with Al-Harasi et al. (2021) and Tu et al. (2021) finding that proactive individuals are more likely to engage in entrepreneurial activities.

This study contributes to the understanding of entrepreneurial intention in vocational colleges by highlighting that educational programs and individual personality traits play significant roles in fostering entrepreneurial intentions. These findings also suggest that demographic factors should not be overlooked, as they shape opportunities and motivations for entrepreneurship across student groups. Integrating Innovation and Entrepreneurship Education: Vocational colleges should include innovation and entrepreneurship education as a core component of their curricula. This can be achieved through specialized courses, internships with start-up businesses, and practical training that allows students to apply theoretical knowledge to real-world scenarios. Accommodating Diverse Demographic Groups: Educational programs should be tailored to meet the specific needs of various demographic groups. This may involve offering scholarships, mentorship programs, and outreach initiatives that ensure equal access to entrepreneurial resources for all students.

CONCLUSION

This study shows that innovation and entrepreneurship education, along with initiative personality, significantly influence vocational students' entrepreneurial intentions. Empirical findings indicate that students with high levels of initiative exhibit stronger entrepreneurial intentions. In contrast, participation in innovation and entrepreneurship education increases their awareness, motivation, and readiness to start a business. Demographic variables such as age, major, economic background, and educational experience also influence the intensity of entrepreneurial intentions, emphasizing the importance of a learning approach tailored to individual characteristics. The main lesson of this study is that integrating formal education with the development of proactive personality and innovative abilities is essential for fostering entrepreneurial intentions among vocational students. These findings suggest that developing an

effective entrepreneurial ecosystem requires synergy among the curriculum, hands-on practice, and the development of students' proactive character to produce a generation of competent, competitive entrepreneurs.

Academically, this study contributes by presenting an integrative framework that combines innovation and entrepreneurship education and initiative personality as determinants of entrepreneurial intentions, particularly in vocational education, a previously understudied area. This research confirms the moderating role of individual psychology in the effectiveness of entrepreneurship education. Limitations of this study include the small sample size among vocational students and the cross-sectional design, which cannot capture the longitudinal development of entrepreneurial intentions. Therefore, future research is recommended to use a longitudinal design to trace the evolution of entrepreneurial intentions from education to the workplace. Furthermore, exploring cultural, environmental, and regional contextual factors can enrich understanding of the determinants of entrepreneurial intentions, inform the development of more adaptive and relevant educational programs for students, and enhance the implementation of strategies to sustainably strengthen innovative and entrepreneurial skills.

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