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RESEARCH ARTICLE

The Influence of Entrepreneurship Education and Entrepreneurial Mindset on Entrepreneurial Intentions of Vocational College Students

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Abstract: This study aims to examine the effect of education and entrepreneurial mindset on entrepreneurial intention, the effect of entrepreneurship education on entrepreneurial mindset, and the role of mediating variables on student entrepreneurial intention. A cross-sectional research method was conducted using a quantitative approach, with data collected through the distribution of Google Forms questionnaires. The research subjects were up to 140 electrical engineering students from Padang State University's engineering faculty. The research subjects were selected using the Slovin sampling technique with a significance level (e = 0.05). Data analysis techniques used partial least squares structural equation modeling (PLS-SEM). The results revealed that entrepreneurship education (H_1) and entrepreneurial mindset (H_3) significantly influenced students' entrepreneurial intentions. Entrepreneurship education significantly affects students' entrepreneurial mindset (H_2). Moreover, the impact of entrepreneurship education on students' intention to pursue entrepreneurship is mediated by entrepreneurial attitude (H_4). These findings indicate that every hypothesis put forth is highly accepted.

Keywords: entrepreneurship education, entrepreneurial mindset, entrepreneurial intention, structural equation modelling

1 Introduction

The study of entrepreneurship has drawn much interest lately, particularly in light of globalization and technological advancement. In the current technological and industrial development era, entrepreneurship is crucial in creating jobs, driving innovation, and increasing economic growth (Kotte et al., 2021; Syed, Singh and Spicer, 2023). Various countries today have realized the importance of entrepreneurship in driving economic and social progress. Furthermore, the quick development of information and technology in today's world has created new chances for business owners to create ground-breaking concepts and break into international markets. Today's rapid development of entrepreneurship is not immune from complex challenges such as intense innovation competition, complex regulations, and changing market trends and technologies that entrepreneurs will face (Ahmed, Khattak and Anwar, 2022; Quintero and León-Serrano, 2023). Thus, an in-depth understanding of entrepreneurial competition, both locally and globally, must be mastered by entrepreneurs.

Developing countries such as Indonesia also feel the development of the entrepreneurial field. However, Indonesia's entrepreneurship is still lagging compared to neighboring countries such as Singapore, Malaysia, and Brunei Darussalam in 2019. Based on rankings by the Global Entrepreneurship Index (GEI) association in 2019, Indonesia was ranked 75th out of 137 countries surveyed with a score of 26.0 (Zoltán, 2019). With this ranking, Indonesia continues to grow in the entrepreneurial sector, whether micro or macro businesses. So in 2,022, the National Entrepreneurial Context Index (NECI) association again conducted a survey of the development of state entrepreneurship, where Indonesia in this survey ranked 7th out of 51 countries surveyed with a value of 5.8 (GEM Global, 2023). These findings demonstrate that Indonesia's entrepreneurial sector expanded rapidly between 2019 and 2022. Even so, the Indonesian population's entrepreneurship percentage is still low at 3.47%, lower than Singapore at 8.76% and Malaysia at 4.75% (Hutasuhut and Aditia, 2022). If Indonesia wants to become a developed country, the percentage of the Indonesian population, with many who

enter the entrepreneurial world, ranges from 12% to 14% (Sudrajat et al., 2023). In order to increase the percentage of entrepreneurial people in Indonesia, the government has carried out various innovative programs starting from the community, such as fostering Micro, Small, and Medium Enterprises (MSMEs) to universities, such as the program pengembangan mahasiswa wirausaha (P2MW). In addition, the government also integrates entrepreneurship learning into the vocational education curriculum, especially in universities, to increase the number of entrepreneurial people (Satriadi et al., 2022).

Because entrepreneurship significantly impacts a nation's economic development, the government seeks to establish a robust entrepreneurial ecosystem through entrepreneurship education to foster students' and the community's entrepreneurial ambitions. In higher education, the government has integrated entrepreneurship education into courses. In lectures, students are required to create entrepreneurial projects to understand how to do entrepreneurship well (Sudrajat et al., 2023). In addition, in universities, the government has also opened many entrepreneurship programs such as P2MW, program mahasiswa wirausaha (PMW), and program wirausaha merdeka (PWK) (Hutasuhut & Aditia, 2022). The government's seriousness towards entrepreneurship education opened an entrepreneurship scholarship explicitly aimed at people working in entrepreneurship to continue their studies abroad. However, at this time, there are still many students whose mindset after graduating from school is that they prefer to work for other companies rather than to become entrepreneurs (Rusmardi & Desi, 2023). Based on previous research, which states that entrepreneurship education carried out today is still not optimal, student intention in working in the world of entrepreneurship is still low (Al-Qadasi et al., 2024), so the effectiveness of entrepreneurship learning needs to be improved so that students' entrepreneurial intention and intentions continue to increase (Handayati et al., 2020; Hutasuhut & Aditia, 2022).

Higher education must provide entrepreneurship education to expose students to the field and foster their desire to pursue business ventures. So, research to examine entrepreneurial intention has been carried out in Indonesia. As explained in previous research (Satriadi et al., 2022; Rusmardi & Desi, 2023), entrepreneurial intention can be influenced by student attitudes, parenting, entrepreneurial culture, and entrepreneurship education. The findings of previous studies (Cao, 2022; Malik et al., 2023) also support the idea that entrepreneurship education in higher education significantly impacts students' entrepreneurial mindset and can help them grow and develop solid entrepreneurial intentions. Previous research also added that entrepreneurial intention is not only influenced by educational factors and mindset alone but also by entrepreneurial opportunities owned by students and by the environment of student educational institutions (Zhuang & Sun, 2023). Entrepreneurial intention is also strongly influenced by students' entrepreneurial mindset because a solid and good mindset toward entrepreneurship can effectively increase students' entrepreneurial intention (Anwar et al., 2023). (see in Figure 1)

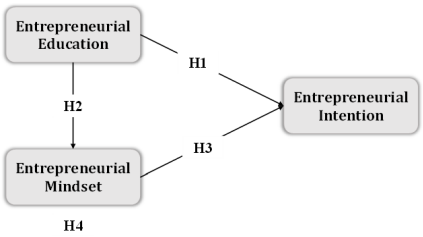

Figure 1 Conceptual framework of research theory

Although research on college students' entrepreneurial intention to start their businesses has been conducted in Indonesia, not all regions in Indonesia have been included. The main objective of this study is to examine entrepreneurial intentions influenced by entrepreneurship education and entrepreneurial mindset. In addition, this study also examines how the entrepreneurial mindset is influenced by entrepreneurship education in vocational colleges. To examine the entrepreneurial intentions of engineering student more deeply, this study also examines the mediating variable, namely the entrepreneurial mindset on entrepreneurial intentions influenced by entrepreneurship education. The results of this study offer a comprehensive understanding of the entrepreneurial intentions of engineering students towards entrepreneurship. This study will also examine more deeply how students' entrepreneurial mindset mediates entrepreneurship education on student's entrepreneurial intention to become entrepreneurs. The results of this study can provide an overview of the entrepreneurial intentions of engineering students, given the low level of entrepreneurial intentions in Indonesian culture. Therefore, the following are the hypotheses proposed in this study, along with the conceptual framework for developing them

depicted in Figure 1, H_1. Entrepreneurship education affects student entrepreneurial intention. H_2. Entrepreneurship education affects the mindset of students. H_3. Entrepreneurial mindset affects student entrepreneurial intention. H_4. Entrepreneurial mindset mediates entrepreneurship education on student entrepreneurial intention.

One course that students attend to acquire the skills, knowledge, and entrepreneurial mindset necessary to succeed as an entrepreneur is entrepreneurship education (Yousaf et al., 2022). Through entrepreneurial learning, educational institutions aim to prepare students to recognize business opportunities, understand the risks and challenges of doing business, and develop innovative ideas for starting a business. Through entrepreneurship learning, students are also prepared to be equipped with leadership and entrepreneurial management skills and how to analyze entrepreneurial opportunities and risks (Wang & Fu, 2023). Entrepreneurship education not only equips students with practical skills such as running a business and business management but also trains mental resilience, creativity, collaboration, and responsibility for their business (Adeel et al., 2023). Thus, entrepreneurship education can develop students' positive mindset toward the benefits of entrepreneurship for their career development. As stated by previous research, entrepreneurship education is the foundation for bringing up mindsets (Handayati et al., 2020). In addition to developing students' entrepreneurial mindsets through entrepreneurship education, it can also increase their entrepreneurial intention. A robust entrepreneurial mindset can also produce high entrepreneurial intentions for students (Zhuang & Sun, 2023). Consequently, the basis of students' entrepreneurial intention and mindset is actively strengthened by entrepreneurship education.

In general, an entrepreneurial mindset is a mindset that directs individual behavior creatively, innovatively, and proactively toward an entrepreneurial activity. In addition, an entrepreneurial mindset can develop through interactions between individuals, the environment, education, and training that an individual goes through (Cui & Bell, 2022). Another aspect of an entrepreneurial mindset is the capacity to see, respond, and mobilize swiftly in controlled and unpredictable circumstances. People with a robust entrepreneurial mindset view hurdles as chances for learning and personal growth rather than barriers (Dheer & Castrogiovanni, 2023). In addition to seeing opportunities, an excellent entrepreneurial mindset can equip individuals with the courage to take a risk in a business. People who take big chances will quickly see all the opportunities around them. By facing various risks, an individual can produce various decisions and actions to advance their business (Wang & Fu, 2023). Based on dynamic challenges and opportunities in entrepreneurship, an individual will generate investment that continues to grow with the creativity of the latest ideas through the development of markets, technology, and industry. A person with dynamic creativity can solve all challenges with the latest approaches to overcome them. Previous research emphasizes that this mindset is a thought of innovation, collaboration, and sustainable growth to achieve success in the entrepreneurial field (Purusottama & Trilaksono, 2019).

The desire or intention to launch and grow a firm through market development is known as entrepreneurial intention. This will involve business opportunities, creating innovations to produce added value products, courage, and motivation to take challenges so that the entrepreneurial goals that have been set can be adequately achieved. Entrepreneurial intention emphasizes individual commitment to developing creative ideas to produce new innovations per market demands. Self-confidence, social environment, previous experience, perception of challenges, education, and entrepreneurial mindset are essential in generating and developing strong entrepreneurial intention and intention (Anwar et al., 2023; Otache et al., 2024). Previous research (Ahmed et al., 2022; Nguyen & Nguyen, 2024) suggests that training, education, and the entrepreneurial mindset of an individual are the main factors that shape students' entrepreneurial motivation and intention. This is predicated on the education and training of the students; they will receive instruction in all aspects of running a business, from design and management to business development, which will shape the students' solid entrepreneurial ambitions and attitudes.

2 Methodology

This study uses quantitative methodology and cross-sectional research methods. This method thoroughly examines the influence of the variables used in the study: entrepreneurial intention, entrepreneurship education, and entrepreneurial mindset of engineering students. The cross-sectional method is one of the research methods used to collect information systematically and answer problems through descriptive explanations that aim to ensure the accuracy of the information obtained (Handayati et al., 2020).

Research is being conducted on students who have completed entrepreneurship courses at the State University of Padang's Faculty of Engineering, Department of Electrical Engineering and they are registered in batches 2020 and 2021. A total of 266 students from the Electrical Engineering Education, Industrial Electrical Engineering, and Electrical Engineering study programs became the population of this study. To obtain a research sample, the sample drawing technique uses the Slovin analysis technique with the significance level used (e = 0.05) (Yanto et al., 2024). Thus, 140 students became the sample size for this study. The sample was gathered using a probability sampling approach with a primary random sampling type (Mayasari & Usmeldi, 2023). Therefore, Table 1 displays the sample characteristics used in this study.

Table 1 Characteristics of the research sample

Study Program	Number of Sample	Percentage (%)
Electrical engineering education	47	33,57
Industrial electrical engineering	47	33,57
Electrical engineering	46	32,86

This study uses a questionnaire instrument as a tool to collect research data. The questionnaire will be assessed using a Likert scale, which has a rating range from 1 to 5 (Luo et al., 2024). The indicators used to compile this questionnaire were taken from a comprehensive and relevant literature study. The information collected with this instrument will provide a thorough understanding of how the influence between the research variables, namely entrepreneurship education (EE) and entrepreneurial mindset (EM), affects the research focus on entrepreneurial intention (EI). The lattice of collection instruments, as shown in Table 2. Questionnaires that have been made will be distributed via Google Forms to students.

Table 2 Research instrument indicators

Variable		Indicator	Theoretical Framework
Entrepreneurial Education	EE1.	Entrepreneurship education in formal settings promotes creative ideas.	Cao, 2022; Malik *et al.*, 2023; Wang and Fu, 2023.
	EE2.	Classroom learning provides the knowledge needed for entrepreneurship.	
	EE3.	On-campus education encourages skills and abilities related to entrepreneurship.	
	EE4.	Educational activities incorporate entrepreneurial material and provide opportunities for students to start businesses.	
	EE5.	I think entrepreneurship opportunities can be enlarged through education activities.	
	EE6.	I believe that entrepreneurship education in schools encourages engineering students to become entrepreneurs.	
Entrepreneurial Mindset	EM1.	I have thought about the opportunities and challenges coupled with entrepreneurial activities.	Handayati *et al.*, 2020; Cao, 2022; Dheer & Castrogiovanni, 2023.
	EM2.	I have seen the time allocation for entrepreneurial affairs	
	EM3.	I have considered financial opportunities to engage in entrepreneurial activities.	
	EM4.	I have evaluated the opportunities and challenges associated with entrepreneurial activities.	
	EM5.	I have decided to look for ideas for business opportunities in entrepreneurial activities.	
	EM6.	I have discussed whether it is beneficial for me to engage in entrepreneurial activities.	
Entrepreneurial Intention	EI1.	I will be ready to do my best to become an entrepreneur in the near future.	Bu, Li and Huang, 2023; Kurata *et al.*, 2023.
	EI2.	I will make every effort to start and manage my own business.	
	EI3.	I will start a business in the near future or after graduating from college.	
	EI4.	I will do my best to achieve my goal of becoming an entrepreneur.	
	EI5.	My ultimate goal is to become an entrepreneur	

The study's theoretical model's ideas are tested using partial least squares structural equation modeling, or PLS-SEM, data analysis technique. In this study, PLS-SEM data analysis was performed utilizing the SmartPLS application's features to guarantee the critical influence amongst the variables under investigation. Before conducting hypothesis testing, validity and reliability tests were also carried out on each indicator of the research variables using the PLS-SEM test (Handayati et al., 2020). In addition, descriptive testing was also carried out in the PLS-SEM test to provide broader information about the relationship between the three variables studied. This test aims to determine the quality of the questionnaire measures used in the study, after which the research hypothesis testing is carried out (Boubker et al., 2021).

3 Results

3.1 Validity and Reliability Analysis

Validity and reliability testing is a test that must be carried out on instrument testing to determine whether the instrument used can measure something that is to be measured and can

show stable measurement results. In this study, two validity analyses were carried out, namely convergent validity and discriminant validity. In addition, reliability analysis was carried out on the instruments used in this study, which included construct reliability analysis and composite reliability. The results of the convergent validity test are displayed in the outer loading and average variance findings from the PLS-SEM study. Table 3 displays the convergent validity testing findings. It is evident from the data that the outer loading value generated falls between 0.716 and 0.893. So, if these results are known to be greater than the outer loading criterion value, which is $\geq$ 0.70, then all items used in the study meet the convergent validity criteria (Al-Qadasi et al., 2024). Strengthening convergent validity results is done by testing the average variance extracted, where the results range from 0.614 to 0.701.

Table 3 Results of outer and construct model testing

Variable	Item	Outer Loading	VIF Value	AVE	CA	CR	Rho_A
Entrepreneurial Education	EE1.	0.800	3.229	0.614	0.876	0.920	0.900
	EE2.	0.776	2.390				
	EE3.	0.773	2.521				
	EE4.	0.740	1.754				
	EE5.	0.817	3.505				
	EE6.	0.792	1.876				
Entrepreneurial Mindset	EM1.	0.716	1.965	0.657	0.894	0.921	0.899
	EM2.	0.766	2.330				
	EM3.	0.822	2.425				
	EM4.	0.810	2.513				
	EM5.	0.877	3.480				
	EM6.	0.860	3.140				
Entrepreneurial Intention	EI1.	0.854	2.686	0.701	0.983	0.905	0.886
	EI2.	0.851	2.571				
	EI3.	0.893	3.215				
	EI4.	0.779	2.036				
	EI5.	0.804	1.894				

Note: EVA (average variance extracted), CA (cronbach's alpha), CR (composite reliability), VIF (variance inflation factor)

The entrepreneurial education (EE), entrepreneurial mindset (EM), and entrepreneurial intention (MI) variables used in this study meet the criteria for good convergent validity because these results are known to be greater than the average variance extracted criterion value, which is $\geq$ 0.50 (Ronaghi & Forouharfar, 2022). Furthermore, discriminant validity testing used the heterotrait – monotrait ratio (HTMT) testing method. Because this method is more sensitive than other methods to test discriminant validity, the HTMT analysis method was used. The HTMT test results are shown in Table 4. The variables used in this study meet the criteria of discriminant validity because each of the resulting HTMT values is known to be less than 0.90 (Nguyen & Nguyen, 2024).

Table 4 Results of discriminant validity testing using the HTMT method

Variable	MI	EM	EE
Entrepreneurial Intention			
Entrepreneurial Mindset	3.029		
Entrepreneurial Education	3.029	1.000	

The following data analysis will analyze the reliability of the instruments used. It is known that the composite dependability value obtained ranges from 0.905 to 0.921 based on the test results displayed in Table 3. The value obtained is greater than or equal to the composite reliability criterion value ($\geq$ 0.70), which means that the variable instruments used in the study meet the composite reliability criteria (Otache et al., 2024). Furthermore, the results of construct reliability are seen from Cronbach's alpha value obtained. The obtained Cronbach's alpha value falls between 0.876 and 0.983. The results obtained are known to be greater than Cronbach's alpha criterion value ($\geq$ 0.70), which means that the variable instruments used in this study meet the construct reliability criteria (Zhuang & Sun, 2023). It is evident from the reliability test results that the measurement consistency of the instruments used in the study has been determined. These two test results show that the internal consistency reliability standards are also met by the research instruments used to measure the variables in this study (Yanto et al., 2024).

The reliability test instrument analysis is carried out to ensure no measurement error in the study. reliability testing is seen from the results of construct analysis from PLS-SEM testing,

be it Cronbach's alpha, composite reliability, and rho_A with a criterion value ($\geq$ 0.70) (Xin & Ma, 2023). Based on the test results obtained in Table 3, all instrument items were used to assess the variables in the study ($\geq$ 0.70), including Cronbach's alpha, composite reliability, and rho_A tests. So, it can be seen that the instrument used meets the reliability test criteria well. Thus, it can be said that the research instrument used is free from measurement error.

3.2 Instrument Collinearity Analysis

Collinearity testing aims to test whether the variable instruments used in the study have a strong relationship between variables. This relationship will hurt the results of the PLS-SEM calculations performed. This study used the variance inflation factor (VIF) data analysis method for collinearity testing. This test is carried out on each item and variable of the research instrument. The collinearity test results for each instrument item are shown in Table 3. The data shows that the obtained VIF value is less than the VIF threshold value (< 5) (Yanto et al., 2024). So, it can be concluded that the research instrument items are free from collinearity problems of research instruments. Tests were also carried out on each instrument variable used in the study. To support the conclusion of a vital instrument collinearity test, collinearity testing is carried out on each research variable; the test results are shown in Table 5. These results show that the VIF values of the research variables are smaller than the VIF criterion value (< 5). Thus, it is known that the research variables are also accessible from the collinearity problem of the research instrument (Dakung et al., 2022).

Table 5 Results of inner VIF collinearity test

Variable	MI	EM	EE
Entrepreneurial Intention			
Entrepreneurial Mindset	3.029		
Entrepreneurial Education	3.029	1.000	

3.3 Structural Model Analysis

Two structural testing models are carried out in this study, namely R square (R^2) testing and Q square (Q^2) testing. R2 testing determines the extent to which exogenous variables can explain endogenous variables. Three criteria were established to categorize the level of R^2 test findings: 0.19 (small), 0.33 (medium), and 0.67 (large) (Handayati et al., 2020). In the meantime, the predictive relevance of the model employed in this investigation is evaluated using Q^2 testing. If the exogenous variables' Q^2 value exceeds zero, the model is said to have strong predictive relevance. The Q^2 test results will be grouped into three categories to determine the level of predictive relevance of the variables in the study. These categories are separated into three groups: $Q^2 \geq$ 0.35 (large), $0.15 \leq Q^2 < 0.35$ (medium), and $0.02 \leq Q^2 < 0.15$ (small) (Dalimunthe et al., 2024). The findings of the R^2 and Q^2 tests are shown in Table 6. Based on the results obtained, the student entrepreneurial intention variable can be explained or has a relationship with an entrepreneurial mindset and entrepreneurship education of 53%, which is included in the moderate category. This is based on the R^2 value of the entrepreneurial intention variable of 0.530. In addition, the student entrepreneurial mindset variable can also be explained or has a relationship with entrepreneurship education by 67%, which is included in the large category. This is also based on the R^2 value of the student entrepreneurial mindset variable of 0.670.

Table 6 Results of R-square and Q-square analysis

Variable	R-square	Criteria	Q-square	Criteria
Entrepreneurial Intention	0.530	Medium	0.355	Large
Entrepreneurial Mindset	0.670	Large	0.430	Large

Furthermore, it is evident from the Q2 test results that every Q2 value produced is greater than 0, demonstrating the solid predictive significance of the employed research model. Entrepreneurship education and mindset variables are important enough to describe the entrepreneurial intention variable with broad criteria, as evidenced by the specific value of 0.355 obtained by the entrepreneurial intention variable. The entrepreneurial education variable is crucial to characterize the entrepreneurial mindset variable in a large category, as indicated by the entrepreneurial mindset variable's value of 0.430. Thus, it can be seen that both the R2 and Q2 tests show positive results, and the model used in the study can be used and accepted correctly.

3.4 Research hypothesis analysis

The PLS-SEM bootstrapping method is used to analyze the path coefficient value, t-statistic/t-value, and p-value to test the hypotheses formulated in this study. Through bootstrapping, results will present stable and accurate data in PLS-SEM analysis (Handayati et al., 2020). Table 7 displays the results of the PLS-SEM bootstrapping test. All hypotheses formulated in this study are well accepted, and the resulting p-value is smaller than 0.05 (Liu et al., 2022). The analysis results revealed a significant relationship between students' entrepreneurial intentions and entrepreneurship education, as indicated by the p-value of the first hypothesis (H_1) of 0.000 $<$ 0.05. The result of analyzing the second hypothesis (H_2), the p-value obtained is 0.000 $<$ 0.05, which indicates a strong relationship between the entrepreneurial mindset of engineering students influenced by entrepreneurship education. The analysis results of the third hypothesis (H_3) get a p-value of 0.001 $<$ 0.05, revealing that the entrepreneurial mindset significantly affects entrepreneurial intention. In addition to analyzing hypotheses that affect directly, this study also reveals indirect effects between research variables. This is stated in the fourth hypothesis (H_4), which has a statistical p-value of 0.001 $<$ 0.05. Thus, students' entrepreneurial mindset significantly mediates the relationship between entrepreneurship education's effect on engineering students' entrepreneurial intention. Thus, it is clear from the data that there is a substantial relationship between the variables studied. Modelling of the variables in testing the research hypothesis, as shown in Figure 2.

Table 7 Results of direct and indirect hypothesis analysis

Hypothesis	Variable Influence	Path Coefficienst	Mean	STD	T-value	P-value	Hypothesis Result
H_1	EE $\rightarrow$ EI	0.462	0.471	0.084	5.362	0.000	Hypothesis accepted
H_2	EE $\rightarrow$ EM	0.818	0.821	0.028	28.236	0.000	Hypothesis accepted
H_3	EM $\rightarrow$ EI	0.300	0.298	0.087	3.370	0.001	Hypothesis accepted
H_4	EE $\rightarrow$ EM $\rightarrow$ EI	-	0.246	0.076	3.226	0.001	Hypothesis accepted

Note: STD (standard deviation)

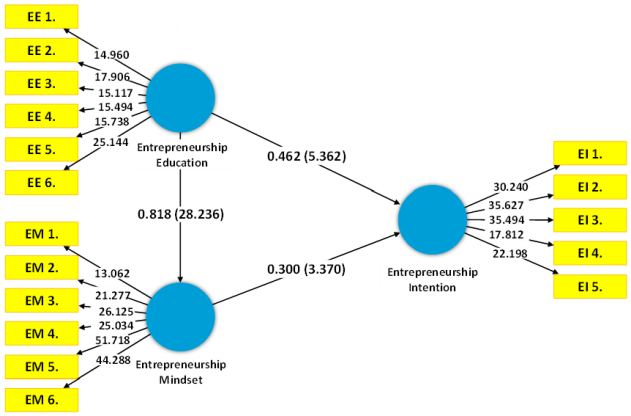

Figure 2 PLS-SEM path analysis bootstrapping results

In this study, the F-square (F^2) test was used to determine the level of influence between variables. Three criteria were used to classify the level of influence between these variables, namely, $F^2 \geq$ 0.35 (large), 0.15 $\leq$ F^2 $<$ 0.35 (medium), and 0.02 $\leq$ F^2 $<$ 0.15 (small) (Fernández-López et al., 2022). The F^2 test results obtained are shown in Table 7. The F^2 value of the entrepreneurial mindset variable is 0.063 with entrepreneurial intention. So, this result can be interpreted as an entrepreneurial mindset affecting students' entrepreneurial intention with minor criteria. The F^2 value between entrepreneurship education and entrepreneurial ambitions is 0.150, indicating that entrepreneurship education can influence students' entrepreneurial intentions in the medium category. Furthermore, the F^2 value of 2.029, which reveals entrepreneurship education and entrepreneurial mindset, indicates that entrepreneurship education can affect students' entrepreneurial mindset in a large category. This clearly shows that entrepreneurial mindset and entrepreneurship education variables can strongly influence engineering students' entrepreneurial intentions for entrepreneurship.

4 Discussion

This study examines the effect of an entrepreneurial mindset and entrepreneurship education on the entrepreneurial intentions of engineering students. To learn more about the relationship

between these variables, this research proposes up to four hypotheses, all of which significantly influence the entrepreneurial intention of electrical engineering students. The results of testing the first hypothesis show that entrepreneurship education significantly affects the entrepreneurial intention of engineering students to pursue entrepreneurship. Through entrepreneurship education, students will gain the information and skills needed to manage the business they will run (Joensuu-Salo et al., 2023; Al-Qadasi et al., 2024). Through entrepreneurship education, students can develop positive attitudes and intention in entrepreneurship. Through entrepreneurial tasks that often exist in entrepreneurship education, it can generate motivation and confidence to pursue business opportunities by being able to face the problems faced. Through entrepreneurship education, students often investigate and experience entrepreneurial practices through simulations, internships, and projects. Through this experience, students will understand the realities and demands of entrepreneurship to increase their entrepreneurial intention (Santana-Domínguez et al., 2022; Kim & Park, 2023).

Entrepreneurship education can also increase student entrepreneurial intention through network learning and support between businesses. Thus, in entrepreneurship education, students can build and develop networks or relationships with fellow entrepreneurs, professional entrepreneurs, and institutions or organizations that support student businesses. This network can foster motivation and intention and provide information for students to do entrepreneurship (Adeel et al., 2023). Based on the literature review analysis conducted by Ronaghi and Forouharfar (2022) and Waluyohadi et al. (2023), overall entrepreneurship education can increase knowledge and skills in students' attitudes, intentions and intentions for entrepreneurship in their respective fields. This fuels the influence between entrepreneurship education with students' entrepreneurship intentions to become entrepreneurs.

Entrepreneurship education influences the entrepreneurial intention of engineering students through entrepreneurship education variables and also affects their entrepreneurial mindset. The results of this study's second hypothesis testing demonstrate that entrepreneurship education significantly impacts engineering students' entrepreneurial mindsets. Through entrepreneurship education, students will be trained to think creatively and innovatively to find entrepreneurial ideas that can become business opportunities for students. Through this approach, students always think critically to create solutions and new ideas to see business opportunities in the conditions they face (Wang & Fu, 2023). Research (Handayati et al., 2020) revealed that entrepreneurship education can strengthen proactive attitudes and take initiative in students to face their challenges and opportunities. This mindset will make students more active, where students do not just wait for opportunities to come but create and pursue these opportunities.

Through entrepreneurship education, students will be equipped to adapt to changes, failures, and obstacles that they may face. With this provision, students will become resilient and brave in facing challenges (Blimpo & Pugatch, 2021; Yousaf et al., 2022). In addition, entrepreneurship education will also build students' business orientation, where students will learn and understand business aspects such as management, marketing, finance and business operations. This learning will shape students' mindset to run a business efficiently and get good results (Purusottama & Trilaksono, 2019). Through entrepreneurship education, students are also equipped with the knowledge and skills to adapt to market, technology, and business environment changes. So that students will be equipped with a dynamic mindset that fits the needs of the market and the industrial world (Kowang et al., 2021). Thus, there is a direct influence between students' entrepreneurial mindset and entrepreneurship education. Students' mindsets will be shaped through entrepreneurship education to become successful entrepreneurs.

In addition to entrepreneurship education, entrepreneurial mindset also affects student entrepreneurial intention. This is evidenced by the third hypothesis in this study, which revealed that entrepreneurial mindset significantly affects student entrepreneurial intention. This result is supported by previous research (Cui & Bell, 2022; Dheer & Castrogiovanni, 2023), which reveals that if students have a strong mindset in the field of entrepreneurship, they will tend to have a higher intention to run a business. This is because they see challenges as opportunities and have confidence that they can overcome them with their abilities. Equipping students with an entrepreneurial mindset will result in an open attitude, confidence, and independence towards learning and self-development. This will encourage their intention in entrepreneurship because they believe that their competencies can manage the business well (Cui et al., 2021; Saptono et al., 2021). Entrepreneurial mindset not only affects students' entrepreneurial attitudes and behaviours but will also affect students' entrepreneurial intentions. The typical mindset of students will produce a solid psychological foundation to generate and maintain entrepreneurial intentions.

In addition, this study found an indirect relationship (mediation) between the research variables formulated in the fourth hypothesis. This study shows that the entrepreneurial mindset variable mediates the relationship between the influence of entrepreneurship education and the entrepreneurial intentions of engineering students for entrepreneurship. This finding leads to the understanding that an entrepreneurial mindset connects entrepreneurship education with students' entrepreneurial intentions. This is also explained in previous research, which explains that the entrepreneurial learning experience possessed by students can affect students' skills, intention, motivation, and intention to do entrepreneurship (Cao, 2022; Adeel et al., 2023). Thus, it is known that entrepreneurship education influences entrepreneurial mindset, which can strengthen students' entrepreneurial mindset. These two variables can significantly affect student entrepreneurial intentions (Handayati et al., 2020; Anwar et al., 2023). This result is based on the research results that have been obtained and strengthened by previous research conducted.

5 Conclusion

The findings of this study provide empirical evidence supporting the positive influence between entrepreneurship education and entrepreneurial mindset on students' entrepreneurial intention. Based on the data collected and analyzed using PLS-SEM data analysis methodology, students' entrepreneurial intentions are significantly influenced by entrepreneurship education. Second, students' entrepreneurial mindset is strongly influenced by entrepreneurship education. Third, students' entrepreneurial mindset significantly influences their' entrepreneurial intention to pursue entrepreneurship. Fourth, additional mediation analysis shows that an entrepreneurial mindset mediates students' entrepreneurial intention to pursue entrepreneurship through entrepreneurship education. So, the research conclusions put forward all significant support for H_1, H_2, H_3, and H_4 proposed in this study. The findings of this study suggest that entrepreneurship education is essential to stimulate and enhance engineering students' entrepreneurial intentions to start their businesses.

Therefore, entrepreneurship education should synergise with business and industry to provide students with a deep understanding of entrepreneurship. This will give students hands-on experience in the world of entrepreneurship. In the entrepreneurship learning process, students should be directly assigned to entrepreneurial projects that students can run. Through this project, students will gain knowledge, skills, and experience in entrepreneurial planning, running a business, and managing a business so that it can run according to its goals. The study's limitations include that it only looked at the impact of entrepreneurship education and entrepreneurial mindset on engineering students' intention to launch their enterprises. It only included research participants from one university in Sumatera Barat. Further research will likely explore more research subjects from various vocational campuses in West Sumatra or Indonesia. In addition, further research is expected to examine the knowledge (cognitive) and skill (psychomotor) factors students possess to foster and increase student entrepreneurial intention.

Conflicts of interest

The authors have agreed to publish the results of this study and there are no conflicts of interest.

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