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The Triangulation Model Distribution of Entrepreneurship Education, Entrepreneurship Knowledge, and Entrepreneurship Mindset

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Abstract

Purpose: This study aims to analyze a triangulation model: 1) the effect of entrepreneurship education (EE) on entrepreneurship knowledge (EK) and entrepreneurship mindset (EM) and 2) the effect of EK on EM. Entrepreneurship education is a medium and pedagogical tool to cultivate EK and EM with the purpose enhancing of students who will be interested in entrepreneurial activities. Knowledge of adequate entrepreneurship is a stimulus strategic tool to develop the entrepreneurial mindset of students. **Research design, data, and methodology:** There were 278 respondents from Business and Non-Business both Indonesian and Malaysian students. The research design was quantitative and evaluated three hypotheses by PLS-SEM using WarpPLS v.7 software. Statistic descriptive for respondent used SPSS IBM v.26. **Results:** The results showed that the three hypotheses had supported with a significant level of p-value < 0.001. It's meant EE enhanced both EK and EM. Furthermore, increasing EM was not only by EE, but also EM could be increased through EK. **Conclusions:** The novelty of this research contributes to filling the knowledge gap in the development of pedagogy in the pursuit of entrepreneurship using a triangulation model of the relationship among EE, EK, and EM.

Keywords : Triangulation Model Distribution, Entrepreneurship Education, Entrepreneurship Knowledge, Entrepreneurship Mindset, PLS SEM

JEL Classification Code : L26, L29, O33, C30

1. Introduction

In the new global economy, entrepreneurship has become a central issue for academics, practitioners, and governments in many countries (Ashari et al., 2022; Fiore & Sansone, 2019; Mousa et al., 2020; Yokoyama & Birchley,

2018). Entrepreneurship has contributed to a short-term or long-term solution for job opportunities and provides welfare to the community, especially as unsung heroes in the Covid 19 pandemic condition (Lee, 2022; Maritz et al., 2020; Rustiana et al., 2021). In addition, entrepreneurship is one of eight competencies essential to be mastered by students

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in promoting personal development and social development, effortlessness to entrance the job market, and building new ventures or scaling existing ones (Colombelli et al., 2022). van Laar et al. (2018) have conducted a systematic literature review (SLR) and indicated that there are seven skills in the 21st-century skills that are essential at least possessed by students. The seven skills are technical, information management, communication, collaboration/social relationship, creativity, critical thinking, and problem-solving. Ghafar (2020) states three skills (social relationships, creativity, and critical thinking) out of the seven 21st-century skills that can be educated and trained through entrepreneurship education. At least these three skills requisites are possessed by students to compete in the world of work in the 21st century and even be able to create independent jobs through entrepreneurship activities. This challenge is relatively complex not only for students but also for higher education institutions. Students are required to cover adequate entrepreneurial knowledge while growing and developing entrepreneurship activities.

Currently, post the Covid 19 pandemic, the development of EE suits appropriate momentum to explore the appropriateness of teaching learning and models for entrepreneurship developing in higher education as a form of participation in supporting government programs (Maritz et al., 2020). Researchers contribute to encounter research variables that encourage EE activities in universities more effectively and attract students to become entrepreneurs. Most studies demonstrate that entrepreneurship develops through good entrepreneurship education (EE). EE drives to increase entrepreneurship knowledge (EK) (Abdullahi et al., 2020; Doan, 2022) and to push fostering an entrepreneurship mindset (EM) (Colombelli et al., 2022).

However, a problem with the previous research is that contradictive results for the relationship linking EE, EK, and EM. The study by Wale-Oshinowo et al. (2018) indicated the influence of EE on EK. Instead, Okeke and Yong (2016) unsuccessfully confirmed the effect of EE on EK. Lack of integration existed research design model that associates the relationship between the three variables EE, EK, and EM into one model. Several researchers linked two of the three relevant variables, namely EE to EM (Mukhtar et al., 2021; Wale-Oshinowo et al., 2018); EE to EK (Okeke & Yong, 2016; Wale-Oshinowo et al., 2018); and EK to EM (Okeke & Yong, 2016; Wale-Oshinowo et al., 2018). Integrating three variables into one model is significant in delineating the relationship among the cause-and-effect relationships of the three variables EE and EK in increasing EM, especially for students in higher education. EE helps students recognize and formally train mindset changes related to entrepreneurship (Larsen, 2022). EE equips students in cognitive, behavioral, and affective aspects to intend and becomes an entrepreneur. The cognitive dimension is known

as entrepreneurship knowledge, and dimensions of behavioral and affective are in the form of an entrepreneurial mindset.

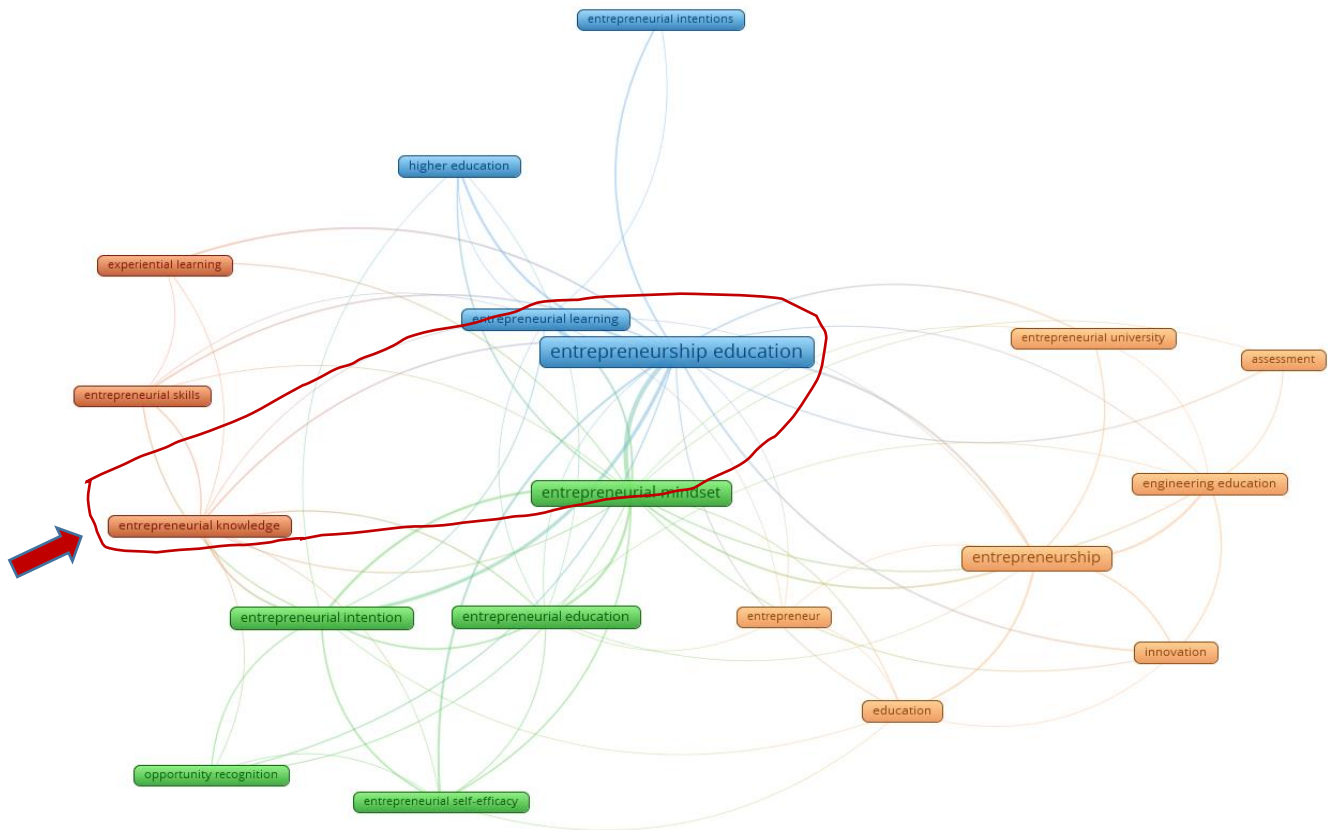
Additionally, based on a previous review of 270 articles published on Scopus from the 1987 – 2022-year periods, figure 1 showed that researchers frequently used the relationship between two variables, such as EE and EM; EE and EK; or EM and EK. A combination of research variables using three variables together (EE, EK, and EM) integrated into one model had not yet been applied.

Okeke and Yong (2016) proposed a conceptual research design involving the variables "entrepreneurship pedagogic structure (EPS)", "entrepreneurship pedagogy assessment outcome (EPSO)", and "institutional connectedness (IC)". There are two dimensions of EPS, namely, first, curriculum structure and second, the form of entrepreneurship pedagogies. Furthermore, EPSO consists of three variables, namely 1) student growth mindset, 2) entrepreneurship knowledge creation, and 3) entrepreneurial human capital assets. While the IC aspect consists of variables 1) education teacher support and 2) career ambition. EPS has a positive effect on student growth mindset and entrepreneurship knowledge creation. Research that combines variables EE, EK, EM, and entrepreneurial preparation (EP) into one model has been carried out by Saptono et al. (2020) by taking 450 Indonesian vocational school students samples in Jakarta city. The results showed that all the hypotheses were supported.

In Figure 1, the three main variables, namely EE, EK, and EM, symbolized all three clusters (blue, orange, and green colors). The model that associated three main variables (this study proposed the term as the triangulation model) (see figure 1 on the red color line) had not yet been elaborated on by researchers in context to deep understand the relationship among the three main relevant variables in entrepreneurial. Consequently, connecting the three key variables in one model is an opportunity for future research in studying entrepreneurship.

The aim is to evaluate 1) the influence of the EE variable on EK and EM and 2) the influence of EK on EM. The contribution of the article introduces triangulation models in the study of entrepreneurship, namely EE, EK, and EM. The significance of the study as an article's novelty is to fill the knowledge gap in the relationship among EE, EK, and EM in one model.

The rest of the paper organizes as follows: literature review in section 2 which discusses the theory of human capital, the definition of knowledge, the mindset theory, and the triangulation distribution model of EE, EK, and EM. Furthermore, section 3 deliberates the research methodology. Section 4 discusses the results of the research and discussion. Finally, section 5 contains conclusions, implications, and suggestions for future research.



Source: Scopus database (keywords: “entrepreneurship education” OR “entrepreneurial education” AND “entrepreneurship mindset” OR “entrepreneurial mindset” OR “entrepreneurship knowledge” OR “entrepreneurial knowledge”)

Figure 1: VOS Viewer Output (n = 270, occurrences = 5 times, and year periods = 1987-2022)

2. Literature Review and Hypotheses Development

2.1. Theory of Human Capital and Entrepreneurship Education

In the year 1964, Becker first introduced the Theory of Human Capital (THC). Referring to the THC, individuals acquire a set of skills and knowledge after bearing through training, school, or other modes of learning. Initially, the THC had intended to estimate employees' income distribution concerning the investment in human capital. Subsequent, entrepreneurship researchers have enforced the THC in predicting models of entrepreneurial success (Østergaard & Marinova, 2018). Therefore, THC describes the relationship between entrepreneurship education and increasing knowledge, skill, and ability to conduct entrepreneurial activities (Debarliev et al., 2022).

There is no standard definition of entrepreneurship education and pivoting on the curriculum used by each

higher learning education. Neck and Corbett (2018) affirm that no one best way to define EE exists. The definition of EE utilized in this article refers to Li and Wu (2019) quoting Linan, 2004. EE definition is “a whole education and training activity that effort to foster participants entrepreneurial intention or some factors that affect the intention, such as knowledge, desirability, and feasibility of the entrepreneurial activity.” EE has the drive to enlighten students on how to run a venture, create, and sustain a business (Ababtain & Akinwale, 2019).

Formal EE is considered one of the components of human capital that supports the improvement of entrepreneurial competence (Debarliev et al., 2022). The role of EE is to transfer knowledge, skills, and abilities related to entrepreneurship from higher education institutions to students.

2.2. Knowledge and Entrepreneurship Knowledge

Knowledge is defined as “A fluid mix of framed experiences, values, contextual information, and expert

insight that proves a framework for evaluating and incorporating new experiences and information. It originates and applies in the mind of the knowers. It often becomes embedded not only in documents or repositories but also in organizational routines, processes, practices, and norms” (Danvenport & Prusak, 1998). Knowledge is a part of a continuous hierarchy of data, information, and knowledge. Information is raw data processed. Then, the information had converted into knowledge in the final order. Furthermore, knowledge complemented with experience, insight, and expertise will yield benefits in the decision-making process (Kabir, 2019).

Malerba and McKelvey (2019) cited Polanyi, 1962, who described “knowledge as an explicit or it can be tacit”, where “explicit knowledge” has founded by way of extracting information from data which had explained in scientific terms as “patents and database”. Whereas “tacit knowledge embedded within individuals or collective experiences, skills, and know-how.” The knowledge distribution usually happens inside and in classroom sessions with students, mentors, and faculties.

Entrepreneurship knowledge is all the necessary knowledge that is beneficial for entrepreneurs about entrepreneurial activities. This knowledge includes business-general knowledge, venture-general knowledge, opportunity-specific knowledge, and venture-specific knowledge (Israel & Johnmark, 2014).

2.3. The Mindset Theory and Entrepreneurship Mindset

Mindset theory is a continuation of motivation theory focused on the concept of the pliability of abilities (Kapasi & Pei, 2022). Based on mindset theory, belief consists of a fixed mindset and a growth mindset. Fixed mindset (the theory of intelligence, believes that a person's intelligence does not change and is not in someone's control. In this belief system, a person's ability is stable and unchanged. The growth mindset or theory of incremental intelligence explains that intelligence is malleable and can be educated and fostered with effort and experience, regardless of differences in talent, concern, or character of the individual (Kapasi & Pei, 2022).

In entrepreneurship research, mindset, and entrepreneur mixes into one term, called entrepreneurship mindset. The entrepreneurial mindset is a character that is inherent in an entrepreneur. An entrepreneur has abilities that reflect entrepreneurs’ characteristics such as a thinker (Naumann & Naumann, 2017), risk taker (Chukwuma-Nwuba, 2018), a person who overcomes challenges (Barnes & de Villiers Scheepers, 2018), and actor according to the main characteristic of an entrepreneur (Adewale Tony et al., 2018), and acceptor responsibility for the outcomes (de Villiers et

al., 2018).

2.4. The Triangulation Model Distribution of EE, EK, and EM

EE concerns enhancing skill-based knowledge, methods, attitudes, and values (Pandit et al., 2018). Entrepreneurship education educates and prepares students with the motivation, knowledge, and skills for becoming an entrepreneur (Shah et al., 2020).

Taking part in improving student entrepreneurial skills, Abdullahi et al. (2020) conducted a two-round Delphi interview with experts in Nigeria regarding the most popular teaching methods. These methods link with matters to enhance entrepreneurship skills as a presence of mindset and knowledge. The results obtained nineteen entrepreneurial skills that developed through EE. These skills consist of problem-solving, financial management, critical thinking, emotional, research/information retrieval, creativity/innovation, active learning, reasoning, organizational skills, interpersonal, leadership, self-directed thinking, life-long learning, time management, resource management, public presentation, critical evaluation of literature, respect for colleagues' views.

Yokoyama and Birchley (2018) cite The Ministry of Trade and Industry Study by the Japanese government, stating that EE aims to grow and train students in developing entrepreneurship and entrepreneurial skills of Japanese entrepreneurs. Three essential entrepreneurial skills are maintained. The first is the ability to dream. Second is the ability to explain a dream (communication skills, logical thinking, presentation skills, personality, and honesty). Finally, it is the ability to realize a dream (skill to collect information, problem-solving, ability to make plans, vitality, judgment/decisiveness, patience).

2.4.1. The Relationship between EE and EK

Students’ entrepreneurship knowledge proceeds through formal education that students take entrepreneurship education. Designing entrepreneurship education aims to foster students’ entrepreneurial knowledge and skills (Gieure et al., 2019). Ashraf et al. (2020) conducted an experimental study on four Pakistani entrepreneur participants. The results showed there a positive correlation between prior entrepreneurial knowledge and education. Secundo et al. (2019) through literature review has shown the creation of knowledge through entrepreneurship education by equipping students through processes and strategies.

Kumar et al. (2020) have conducted an SLR on the impact of entrepreneurship and business education. The results of the elaboration of the article expose that EE triggers knowledge creation and develops throughout

business plans, activities, and entrepreneurial actions. Students strengthen knowledge and skills-based entrepreneurial education through various learning methods, such as experiential learning, problem-solving, and theory-based-practical (Abdullahi et al., 2020). The detailed content of entrepreneurship knowledge consists of 1) answers to the questions “about” and “for” entrepreneurship, 2) general entrepreneurship, 3) business plans, and 4) fundamental startup (Ndou et al., 2018).

Thus, the hypothesis of the study is as follows:

H1: EE has a positive effect on EK students’

2.4.2. The Relationship between EE and EM

Entrepreneurship education urges students to develop self-confidence, optimism, and persistence to become entrepreneurs. In addition, EE imparts students to risk acceptance and the ability to manage risk. Creating an entrepreneurial mindset among students through entrepreneurship education is substantial (Jena, 2020) because entrepreneurship education preserves to catalyze an entrepreneurial mindset (Taşdemir, 2019). Lindner (2020) argues that an entrepreneurial mindset can educate from generation to generation. EE shows a business role in boosting entrepreneurial mindsets by supporting students to develop capacity, competence, and the right attitude to transform innovative ideas, technologies, and inventions into commercially viable products and services to create economic and social value (Ndou et al., 2019). Entrepreneurship education has a substantial role in enlightening an entrepreneurial mindset (Blankesteyn et al., 2021).

Ndou et al. (2019) conducted a literature study to find more specific linkages between EE development and innovation to improve EM, use technology as a tool, and become one of the content materials of the EE curriculum. Entrepreneurship education drives entrepreneurial inspiration for students and enhances entrepreneurial mindset (Lindner, 2020). Entrepreneurial is a mental mindset that leads people frequently call up entrepreneurship anywhere and actively participate in social life. According to Lindner (2020), entrepreneurship is divided into three phases. The first phase is a beginner learning to become an entrepreneurial phase. This phase is the awareness and development phase of EM. The main goal of EE in this phase is to strengthen the entrepreneurial mindset. The second phase is the independent phase. The third phase is the competent learner’s phase.

A lack of entrepreneurial mindsets causes business breakdowns for many reasons (Camillo, 2020). Therefore, Tessier and Dalkir (2016) propose a conceptual model that

curriculum context knowledge positively impacts enhanced students' growth mindset. EE consists of creating opportunities and resources, risk-taking, coping with change, committing to goals, and acting with mindset innovativeness. Phrakhuopatnontakitti (2019) studied 267 students from various campuses in Thailand. The study verified that entrepreneurship education affects the mindset and entrepreneurial skills of a person undergoing entrepreneurship. The other study conducted by Gorlewicz and Jayaram (2020) that had developed an EE module to increase student EM. They conduct initial research based on sixty students in the USA related to EE having a positive effect on EM. EE is an intervention program to nurture students towards developing a job-creating mindset more than trying to find a job-seeking mindset (Wale-Oshinowo et al., 2019). Therefore, the research hypothesis states as follows:

H2: EE has a positive effect on EM students’

2.4.3. The Relationship between EK and EM

Tessier and Dalkir (2016) indicate that entrepreneurial knowledge (EK) which is proxied by curriculum structure (context knowledge, content knowledge, and content delivery) has a direct impact on improving students' growth and development mindset. The higher the student's EK, the better the entrepreneurial mindset (EM) they have. Igwe et al. (2021) conducted qualitative research by identifying six steps in a pedagogic model of entrepreneurial learning. The six steps are knowledge and cognitive, innovativeness in teaching pedagogy, thinking changing, network and social learning, action changing, and attitude changing. Entrepreneurship knowledge encourages an attitude of a new mindset that creates a positive association between entrepreneurship, individual success, and the creation of wealth through creative actions. Hence, the statement of hypothesis is as follows:

H3: EK has a positive effect on EM students’

2.5. The Summarize of the Previous Studies

Table 1 contains a summary of the main theory, research design and main issue. The theory/concept used by the researchers is first, HCT to describe the relationship between EE and EK and EM. Second, the critical thinking framework, which is used to explain the relationship between EK and EM. Furthermore, the research design is steamy quantifiable, qualitative, and systematic literature review.

Table 1: Summary of Main Theory, Research Design and Main Issue from Previous Studies

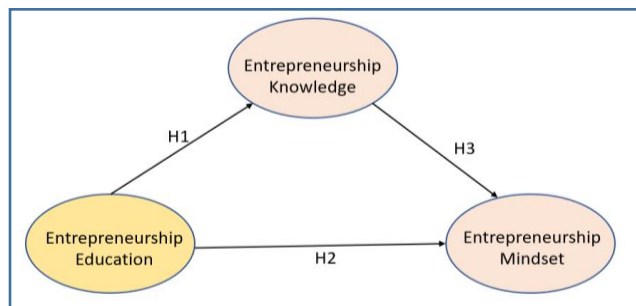
Path	Authors, year	Main theories/ research design	Main issue
EE → EK	Ashraf et al. (2020)	Qualitative exploratory	EE is substantial factors to improve EK students becoming an entrepreneur.
	Debarliev et al. (2022)	Human capital theory (HCT); quantitative	EE highlight to improve EK students.
	Gieure et al. (2019)	Quantitative	EE give students practical knowledge from real-world scenarios and theoretical knowledge on business creation.
	Kumar et al. (2020)	SLR	EE support EK with entrepreneurial activity to create new Ventura.
	Secundo et al. (2019)	SLR	In one of some clusters, EE creates students' EK with new methods based on trend, tools, and dynamics of entrepreneurship.
	Østergaard & Marinova (2018)	HCT; qualitative	EE helps supply four types of material EK that adapt to the needs of forth types of entrepreneurs (the local entrepreneur, the global entrepreneur, the incremental entrepreneur, and the radical entrepreneur.
EE → EM	Debarliev et al. (2022)	HCT; quantitative	EE support to increase growth mindset of students
	Hrakhruropatnontakitti (2019)	Quantitative	EE enriched the entrepreneurial inspiration of students and supported the creation of learners' entrepreneurial mindset.
	Wale-Oshinowo et al. (2018)	Quantitative	EE has a significant encouragement on students' entrepreneurial mindset.
	Østergaard & Marinova (2018)	HCT; qualitative	EE provides basic innate and learned skills for students to cultivate a common mindset such as: courage, determination, diligence, explorative, intelligence, intuition, and self-confidence.
EK → EM	Igwe et al. (2021)	Critical thinking framework from Hilsdon (2010); quantitative	Critical thinking as an ability to do knowledge-transforming is more than just knowledge telling. Knowledge-transforming boasts a positive impact on the type of growth mindset, because the transfer of knowledge drives mindset of individual growing and developing.

3. Methodology

3.1. Research Design

The study provided work for a quantitative approach to assess the triangulation model of relationships between entrepreneurship education, entrepreneurship knowledge, and the entrepreneurship mindset. The relationship among these variables explains in Figure 2 (conceptual framework).

3.2. Participant and Data Collection

**Figure 2:** Conceptual Framework

Students had filled out an online questionnaire survey on Microsoft Form that was taken from a link <https://forms.office.com/r/SsnJurvevT>. The respondents who had taken entrepreneurship classes or similar courses from Universiti Teknikal Malaysia, Melaka and Universitas Atma Jaya Yogyakarta, Indonesia. A total of 69.5% or 278

students of 400 students who participated submitted incomplete questionnaires. The students' demographic data were presented in Table 2.

Most respondents were from Indonesia, 76.3%, and Malaysian 23.7%. The male gender dominated, 56.5%, compared to the female gender 43.5%. A total of 127 respondents were from families that owned businesses and 151 respondents from non-business families had a family background in business, which was 59.7%.

Table 2: Respondent Demographics Data

Demographic data	Male	Female	n total
Country:			
• Indonesia	127 (45.7%)	85 (30.6%)	212 (76.3%)
• Malaysia	30 (10.8%)	36 (12.9%)	66 (23.7%)
	157 (56.5%)	121 (43.5%)	278 (100%)
Education major:			
• Business	79 (28.4%)	48 (17.3%)	127 (45.7%)
• Nonbusiness	78 (28.1%)	73 (26.3%)	151 (54.3%)
	157 (56.5%)	121 (43.5%)	278 (100%)
Family background			
• Entrepreneurship experience	88 (31.7%)	78 (28.1%)	166 (59.7%)
• Non-entrepreneurship experience	69 (24.8%)	43 (15.5%)	112 (40.3%)
	157 (56.5%)	121 (43.5%)	278 (100%)

3.3. Measures

A five-point Likert scale, ranging from one (strongly disagree) to five (strongly agree), was utilized to measure three latent variables. In measuring entrepreneurship education, the researcher used fourteen items extracted from Jena (2020) which included three dimensions: cognitive, behavioral, and attitude. Then, the entrepreneurship knowledge measurement used five items (Roxas, 2014). Furthermore, the entrepreneurship mindset was measured using three items taken from Davis et al. (2016). The selection of indicator items of all latent variables in this study was based on Hair et al. (2014) items with loading factors above 0.7

3.4. Statistical Methods

Data analysis was done by 1) SPSS IBM v.26 for descriptive analysis and 2) PLS-SEM (partial least square structural equation modeling) with the SmartPLS v. 7.0. This software had several advantages (Janib et al., 2022; Kock, 2020). First, it had appropriate for studies with small sample size. Second, it is used pervasively in a wide variety of fields, Third, this software posed classic PLS algorithms and factors based PLS algorithms for SEM. Four, this software explicitly identified nonlinear functions connecting pairs of latent variables in the SEM model and calculate multivariate coefficients of association accordingly. Finally, the PLS-SEM method offered additional analysis, such as moderating effects (Hair et al., 2014). Sarstedt et al. (2022) reveal several rational reasons to utilize PLS-SEM: 1) small sample size, 2) non-normal data, 3) theory development and exploratory research, 4) formative measure, 5) high model complexity, and 6) predictive study focus

4. Results and Discussion

4.1. Model Fit and Quality Indices

Referring to Hair et al. (2014), WarpPLS does not provide a single goodness-of-criterion fit to evaluate PLS-SEM estimations. Instead, nonparametric evaluation criteria based on bootstrapping and blindfolding are used. Therefore, WarpPLS has provided ten quality indicators to assess the fit or absence of a research model (Kock, 2020). The quality indicator and result score were in Appendix 1.

4.2. Measurement Model Assessment (Outer Model)

After assessing the reflective model in the outer model, we evaluated the reliability and validity of the construct measurement. This reliability used composite reliability and Cronbach alpha, each value was above 0.7 (Hair et al., 2014). The next step assessed convergent validity and discriminant validity. Convergent validity each item had an outer loading factor above 0.7 dan each construct's average variance extracted (AVE) was 0.5 or higher (Hair et al., 2014a). Means of AVE above 0.50 that the construct describes more than half of the variance of its indicators.

Discriminant validity is a construct that measures what it is intended to measure. This validity characterizes the extent to which the construct is empirically distinct from other constructs. In this study, discriminant validity is based on Fornell and Larcker's (1981) criterion. To test this requirement, the AVE of each construct should be higher than the highest squared correlation with any other construct (see Table 4).

Table 3 showed the reliability results for CR and CA ranging from 0.8 – 0.9 while for convergent validity each AVE above 0.5, namely for EE (0.580), EK (0.736), and EM (0.630). The loading factor for 22 items of the three constructs all exceeded 0.7.

Table 3: Reliability and Convergent Validity Results

No	Code	items	Convergent validity		reliability	
			Loading factor***	AVE	CR	CA
1	EEB1	Increasing interest in an entrepreneurial career	0.726	0.598	0.954	0.948
2	EEB2	Giving information on entrepreneurship career	0.744			
3	EEB3	Happy in taking entrepreneurship education	0.806			
4	EEB4	Entrepreneurship as a desired career option	0.726			
5	EEB5	Encouraging to start Ventura after graduation	0.784			
6	EEC1	Able to identify a business opportunity	0.773			
7	EEC2	Able to create services and/or products that satisfy the needs of customers	0.744			
8	EEC3	Able to develop a business plan	0.782			
9	EEC4	Have the skill to create a new business	0.781			
10	EEC5	Success to identify the source of business change	0.789			
11	EEC6	Stimulate university interest in entrepreneurship	0.813			

12	EEC7	Skill, knowledge, and interest in entrepreneurship have improved	0.828	0.744	0.935	0.913
13	EEC8	Overall, satisfied with entrepreneurship education	0.747			
14	EEA1	Supporting from university to prepare for an entrepreneurship career	0.774			
15	EK1	Knowing how to find financial resources	0.768			
16	EK2	Knowing how to organize the business	0.909			
17	EK3	Knowing how to market a product/service	0.854	0.682	0.865	0.767
18	EK4	Knowing how to commercialize a business idea	0.877			
19	EK5	Knowing how to manage business	0.898			
20	EM1	Passion	0.813			
21	EM2	Self-confidence	0.818			
22	EM3	Persistence	0.846			

Note: reflective, *** P-value < 0.001

EEB = entrepreneurship education – behavioral; EEC = entrepreneurship education – cognitive; EEA = entrepreneurship education – attitude; EK = entrepreneurship knowledge; EM = entrepreneurship mindset; AVE = average variance extracted, CR = composite reliability; CA = Cronbach Alpha

Table 4: Discriminant Validity for Reflective Constructs (Fornell-Larker method)

Construct	Correlations among independent variables with square roots of averages			Full collinearity variance inflation factors (VIF) < 3.30 ^a
	EE	EK	EM	
Entrepreneurship education (EE)	0.773	0.540***	0.497***	1.582
Entrepreneurship knowledge (EK)		0.863	0.467***	1.520
Entrepreneurship mindset (EM)			0.826	1.434

Note: reflective,*** p-value < 0.001; ^a according to Kock, (2020)

Based on Table 4, the three latent variables met the discriminant validity either by Fornell-Larker or by utilizing full collinearity VIF < 3.3 (Kock, 2020). EE correlated with the variables EK and EM at the significance level of p-value <0.001.

4.3. Structural Model Assessment (Inner Model)

PLS-SEM does not have a standard goodness-of-fit statistic. Instead, the assessment of the model’s quality is based on its ability to predict the endogenous constructs (Kock, 2020). The following criteria facilitate this assessment: Coefficient of determination (R²), cross-validated redundancy (Q²), path coefficients, and the effect size (f²)(Hair et al., 2014). The R² is a measure of the model’s predictive accuracy. The Q² purpose is to assess the inner model’s predictive relevance. Path coefficients characterize the hypothesized relationships linking the constructs (Hair et al., 2014).

Based on Table 4, this research indicated the R² value for

EK and EM tended weak in predicting the accuracy of endogenous variables.

Table 5: The Predictive Relevancy and Effect Size

Const ructs	R ²	Significance of Endogenous Latent Variables	Q ²	Effect Size
EK	0.302	Weak	0.301	Medium
EM	0.326	Weak	0.301	Medium

Note: R² significance of endogenous latent variables. ≥ 0.75 = substantial, ≥ 0.50 = moderate; and ≥ 0.25 = weak Q² value size effect: 0.02 ≤ small; 0.15 ≤ medium; 0.35 ≤ large

Despite this, based on the value of R², one exogenous variable, namely EE, explained 30.2% of its impact on EK. While the remaining 69.8% came from other exogenous variables. Likewise, one exogenous variable EE was able to explain 32.6 of its impact on EM and the remaining 67.4% came from another exogenous variable. As for the Q² value in reflecting predictive relevance, EE predicted the variables EK and EM, including medium.

Table 6: The Result of Hypothesis Testing

H	Variables Path	Path Coefficient	Standard Error	P-Value	Result
H1	EE to EK	0.549	0.043	<0.001***	supported
H2	EE to EM	0.330	0.043	<0.001***	supported
H3	EK to EM	0.307	0.043	<0.001***	supported

Note: one tail, p-value < 0.001

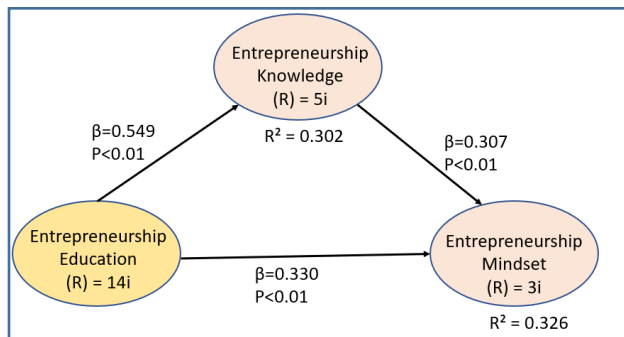


Figure 3: Structural Model for The Research

The results of hypothesis testing (tabulated in Table 6) showed that all hypotheses (H1, H2, and H3) were supported with a significance level of $p\text{-value} < 0.001$. Figure 3 displayed the results of WarpPLS 7.0 with path relationships (β and $p\text{-value}$) between exogenous and endogenous variables in the research model.

4.4. The Effect of EE to EK

Based on Table 6, H1 was supported and confirmed that EE affects EK by 0.549 with a $p\text{-value}$ of < 0.001 . Influencing of EE on EM by 33% was greater than the influence of EK on EM by 30.7%. According to the system concept, EE is input and processed in producing knowledge as an output form of a system. The results of this study confirm the research of Saptono et al. (2020) and Wale-Oshinowo et al. (2018). Yet, this research did not confirm Okeke and Yong (2016). Their study involved 378 Malaysian students and showed that EE had not affected EK.

This study's EE dimension associated with EK was on the cognitive dimension. The more EE students demonstrated the cognitive dimensions of EE (such as students' skills to identify business opportunities; the ability to provide excellent service for consumers; students exercising to develop business plans; and create new businesses), the more EK students had. EK had amplified in terms of finding financial resources, organizing businesses, entering markets, commercializing ideas, and managing businesses. EE aims to prepare individuals who want to be a person who works for themselves, but also enormously valuable for those who work directly for an entrepreneur and or in large corporations that have entrepreneurs as clients, suppliers, or partners (Maritz et al., 2020). The basic EK includes basic knowledge about establishing or managing a business (such as production, funding, marketing, human resources, accounting, and information technology). This knowledge is crucial for a prospective entrepreneur.

EE drives students to increase their understanding of EK with entrepreneur characteristics, various entrepreneurial aspects, knowledge of business, and various resources used

in building a business and influencing students' entrepreneurial capacities and competencies (Wale-Oshinowo et al., 2018). EE suit an efficient mechanism for transferring EK to students (Belitski & Heron, 2017); enhances students' abilities and skills to connect and improve creativity, knowledge acquisition and independence, decision, and self-responsibility (Lindner, 2020). EE focuses more on the codification of knowledge through formal education (Blankesteyn et al., 2020; Wale-Oshinowo et al., 2018).

4.5. The Effect of EE to EM

Based on Table 6, the effect of EE on EM was 33% with a $p\text{-value}<0.001$, so H2 was supported. This study showed that EE had a positive impact on EM, this confirmed the results of Mukhtar et al. (2021) with the following explanation: 1) Bandura's social cognitive theory, which states that the pedagogical approach in education has a positive impression on students' cognitive ability to disclose activities in class, 2) Social cognitive theory provides a coherent perspective for students' understanding of entrepreneurship activities from a cognitive psychology point of view so that they benefit from genuine experience related to entrepreneurship. This study also confirmed the study Wale-Oshinowo et al. (2019) conducted studied on 250 students in Nigeria to examine the extent to which entrepreneurship education influences the entrepreneurial mindset of students in tertiary institutions. The result showed that entrepreneurship education significantly successfully increased the EM of students in Nigeria.

The results showed that the more students who took part in EE, the interest in pursuing a career as an entrepreneur increased because they had received information and education. Students were encouraged to start a business after graduation, and the universities supported to practice students in starting entrepreneurial careers. The EE obtained by students will boost passion, self-confidence, and persistence as their EM representation will increase. Thus, the more EE that students acquired, the more students' EM increased. Moreover, the impact of EE on growth mindset development through embedded heuristic strategies, such as reviewing the EE program, assessment of pedagogic entrepreneurship, and evaluating the curriculum (Tessier & Tessier, 2016).

Meanwhile, the results of this research are not in line with the research of Cui et al. (2019) found that the influence of EE is heterogeneous on the EM of students in China with a negative sign. Learning was more intense on learning "about" entrepreneurship before Covid 19. Then in a pandemic COVID 19 situation, entrepreneurship education finds its impetus (a moment in time) to upgrade into learning "for" and "through" entrepreneurship.

4.6. The Effect of EK to EM

This research showed there was an effect of EK on EM by 30.7%, p -value $<0,001$. It meant that H3 supported and confirmed the research of Handayati et al. (2020); Mukhtar et al. (2021); Okeke and Yong (2017). A nascent entrepreneur knows about finding resources used for business, including introducing and marketing products or services. This had an impact on the entrepreneurship mindset manifested in the dimensions of passion, self-confidence, risk acceptance, execution, persistence, future focus, and optimism. The individual's initial knowledge influences the entrepreneurial mindset (Mukhtar et al., 2021). However, the results of this study did not confirm the study of Karyaningsih et al. (2020).

This study showed that students at both universities who knew entrepreneurship knowledge (for example how to find financial resources, organize the business, market a product/service, commercialize a business idea, and manage the business) drive to increase student EM in passion, self-confidence, and persistence in carrying out entrepreneurial activities.

5. Conclusion

This study delivers empirical evidence that H1, H2, and H3 were supported. Entrepreneurship education had a significant positive effect on both entrepreneurship knowledge (H1) and entrepreneurship mindset (H2). This confirmation that entrepreneurship education has succeeded in increasing the entrepreneurship knowledge and the entrepreneurship mindset of students in both universities. The amount of β value of EE to EK is the largest compared to the two variables path (EE to EM and EK to EM). Thus, this research can be said to indicate that the EE variable is most effective at increasing EK compared to the effect of EE on EM. Entrepreneurship knowledge had a significant positive effect on entrepreneurship mindset (H3). This congruently means that EE affected EM both directly and indirectly through EK to EM. It proposed that EK served as an intervening variable. Furthermore, when considering the magnitude of the value of β variables that is capable of increasing EM more is through EE ($\beta = 0.330$) compared to EK ($\beta = 0.307$).

This research provides two contributions. First, the academic contribution form of novelty research is to fill the knowledge gap by practicing the triangulation distribution model of entrepreneurship education, entrepreneurship knowledge, and the entrepreneurship mindset. Second, contribution to education in the entrepreneurship class to foster student entrepreneurship interests through an appropriate combination the entrepreneurship education,

entrepreneurship knowledge, and entrepreneurship mindset.

This study has several limitations and at the same time provides suggestions for future research. First, the results of this research cannot be generalized because the sample of respondents is only from two universities. The sample should be extended beyond both universities as highly recommended for future research. Second, the design of this research is in the form of a quantitative design although all hypotheses were supported. It will be even better in the future if the research design can be a hybrid by combining quantitative and qualitative research designs. Due to hybrid design, researchers preserve a deep understanding of more specific information. For example, what kind of EE design to improve EK, and EM more effectively adapted to bold the characteristics of students. Finally, this triangulation distribution model of EE, EK, and EM can be retested using entrepreneurs' samples to seek the model's robustness.

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Appendix

Appendix 1: Model Quality Indicator from WarpPLS 7.0

No.	Fit Model	Quality Indices	Result
1	Average path coefficient (APC)	$p < 0.005$	APC = 0.396, $p < 0.001$
2	Average R-squared (ARS)	$p < 0.005$	ARS = 0.314, $p < 0.001$
3	Average adjusted R-squared (AARS)	$p < 0.005$	AARS = 0.312, $p < 0.001$
4	Average block VIF (AVIF)	acceptable if ≤ 5 , ideally ≤ 3.3	AVIF = 1.580 (ideally)
5	Average full collinearity VIF (AFVIF)	acceptable if ≤ 5 , ideally ≤ 3.3	AFVIF = 1.513 (ideally)
6	Tenenhaus GoF (GoF)	small ≥ 0.1 , medium ≥ 0.25 , large ≥ 0.36	GoF = 0.460 (large)
7	Sympson's paradox ratio (SPR)	acceptable if ≥ 0.7 , ideally = 1	SPR = 1.000 (ideally)
8	R-squared contribution ratio (RSCR)	acceptable if ≥ 0.9 , ideally = 1	RSCR = 1.000 (ideally)
9	statistical suppression ratio (SSR)	acceptable if ≥ 0.7	SSR = 1,000 (ideally)
10	nonlinear bivariate causality direction ratio (NLBCDR)	acceptable if ≥ 0.7	NLBCDR = 1.000 (acceptable)