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Navigating the entrepreneurial knowledge and competence among vocational students: the role of economics education

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ABSTRACT

Vocational education in Indonesia is emphasized not only to develop competent workers but also to foster innovative and independent entrepreneurs, aligning with government policies to create more young entrepreneurs amid global competition and evolving job market demands. This study aims to investigating the influence between economic education and entrepreneurial competence (ECOMP), with entrepreneurial knowledge (EK) as a mediator. This study employs a quantitative approach, using surveys conducted at vocational high schools in Jakarta. A sample of 247 students was collected through convenience sampling, and data was processed using structural equation modeling (SEM) with Amos 25. The study found that economics education (EC) significantly enhances EK and competence among vocational high school students, both directly and indirectly. By developing a strong understanding of economic and business concepts, students are better equipped to succeed in the business activities. The findings emphasize the importance of improving EC with a focus on practical applications to help students acquire the essential skills required to achieve success as entrepreneurs.

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1. INTRODUCTION

Global economic development has undergone a significant shift towards a knowledge-based economy, where entrepreneurship is the main driving force [1]. Entrepreneurship is not only vital in creating jobs and innovation, but also as an effective tool in fighting for a country's economic resilience [2]. In this context, education serves an essential role in shaping entrepreneurial readiness and skills, especially among vocational students who are potential human resources to become future entrepreneurs. The increase in Indonesia's micro, small, and medium-sized enterprises (MSMEs), indicates the importance of encouraging entrepreneurship in the national economy [3], [4]. However, the challenges faced by MSME actors, especially those who are just starting out, are often related to the lack of entrepreneurial knowledge (EK) and competency [5], [6]. This highlights the importance of integrating effective economics education (EC) into the vocational curriculum, which not only provides basic economic knowledge but also develops entrepreneurial skills and competency [7].

In many countries, including Indonesia, vocational education is directed not only to prepare students to become competent workers but also as innovative and independent entrepreneurs [8], [9]. This is in line with government policy that expects vocational education to be a catalyst in creating more young entrepreneurs. Vocational education in Indonesia has received significant attention as a medium to strengthen the capacity of human resources who are not only competent in technical skills but also have entrepreneurial abilities. Amid increasing global competition and demands for adaptation to changes in the job market, economic education and entrepreneurial competence (ECOMP) is an essential key that can support individual success in this dynamic economy [10]. Enhancing entrepreneurial skills in vocational education not only increases employment prospects but also bolsters national competitiveness by fostering innovators who can effectively respond to evolving market demands [11].

ECOMP describes the capacity to successfully perform entrepreneurial tasks and functions, by effectively identifying and exploiting business opportunities [12]. In the context of vocational education, this competence becomes important because it equips students with the requisite resources to not only start a business but also to survive and thrive in a highly competitive environment. EC has been acknowledged as an important tool for developing students' understanding of economics and business management [13], [14]. Along with this understanding, many researchers have explored how EC can provide a strong foundation for entrepreneurship development [15]–[17]. Research by Debarliev *et al*. [18] shows that EC serves an crucial function in developing analytical skills and market understanding needed by entrepreneurs. In addition, EC is also often associated with increased creativity and innovation, important aspects needed in running a business [19].

EK is often seen as a bridge between economic theory and practical application in entrepreneurship [14], [20]. EK encompasses not only the technical expertise required to establish and operate a business, but also the capacity to recognize market opportunities and take calculated risks [21]. Several studies have identified that EK acquired through EC can significantly mediate the relationship between formal education and effective entrepreneurial performance [21], [22]. A research conducted by Bauman and Lucy [9] explored how the implementation of education can affect ECOMP through EK. Their results showed that education contributes to increasing EK, which in turn improves students' ability to apply ECOMP. Several studies have also emphasized the importance of integrating EC with entrepreneurial activities to create a learning environment that supports entrepreneurial development [23], [24].

The importance of integrating EC with entrepreneurship is becoming increasingly evident, in the realm of vocational education. Experiences from countries that have adopted this approach show a significant increase in the success of businesses founded by vocational graduates [25], [26]. The emphasis on practical and applied EC can facilitate a better understanding of market needs and effective business strategies, in order to prepare students to become successful entrepreneurs [27]. EC which combines economic principles with business management and entrepreneurship, is becoming more relevant. Although many studies have shown a positive correlation between EC and entrepreneurship, few have examined the mediating role of EK in depth [28], [29]. There is a lack of understanding of how the process of transferring EK might occur between EC and the development of entrepreneurial skills, particularly among vocational students.

This study seeks to address this void by examining the relationship between economic education and entrepreneurial ability, with EK serving as a mediator. The majority of prior research has concentrated on the direct influence of economic education on ECOMP [18], [30], while this study delves deeper into the role of EK as a bridge connecting the two variables. Thus, this study not only tests the direct influence between economic education and ECOMP, but also examines how knowledge gained through economic education can change and improve ECOMP. This study is expected to make significant contributions to the literature on economic education and entrepreneurship in several ways. First, through the identification and analysis of the influence of economic education on EK that can mediate the development of ECOMP. Second, this study offers a theoretical framework that can be used by educators to design more effective curricula that directly support the development of entrepreneurial skills among vocational students. Through this approach, this study not only contributes to the academic literature, but also to the practice of vocational education and policy, with the hope of forming a generation of young entrepreneurs who are more competent and innovative.

2. METHOD

2.1. Research design

This study uses a quantitative approached with data collection through a survey conducted at vocational high schools in Jakarta, Indonesia. Along with the development of the curriculum for economics and entrepreneurship education as compulsory subjects, various facilities and programs have been provided to support student learning, such as laboratories and various entrepreneurial activities in schools. This is to support one of the goals of vocational education in preparing the younger generation as entrepreneurs. The focus of

this study is to identify the role of EC in improving EK and ECOMP of students in vocational schools. The detail of the research framework is provided in Figure 1.

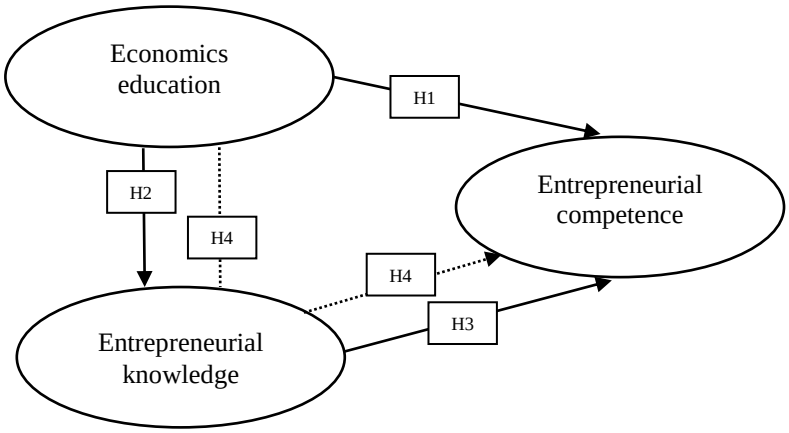

Figure 1. Research framework

2.2. Participants and data collection

The study population consisted of vocational high school students in the Jakarta area. The sample was selected via convenience sampling. Based on recommendation by Loehlin [31] a minimum sample size of 200 is necessary to mitigate bias in all forms of structural equation modeling (SEM) estimates. Thus, 300 questionnaires were distributed to vocational high schools in the Jakarta area, which were collected in the period June-August 2023. A total of 247 of them were returned, and filled out correctly which were then used for data processing. The following is a more comprehensive breakdown of the demographic information of the respondents; i) gender: male 84 (34%) and female 163 (66%); ii) grade level, grade 10: 41 (17%), grade 11: 121 (49%), and grade 12: 85 (34%); and iii) parents' occupation, private employee: 102 (40%), civil servant: 64 (26%), military/police: 36 (15.0%), entrepreneur: 31 (13%), and others: 14 (6%).

After completing a comprehensive evaluation of previous research, a research questionnaire was prepared which will serve as the primary instrument for this study. The EK questionnaire was adopted from research by Roxas [32]. Meanwhile, the ECOMP questionnaire was adopted from research by Ndou *et al*. [33], and the EC measurement scale was adapted based on the indicators set by Zabelina *et al*. [34]. This research utilized a likert scale with five points, and a total of fourteen questionnaire items were translated into Indonesian. These translations were evaluated by specialists to ensure that they were easily understood by the individuals who participated in the study. Following the approval of the school and the teachers, the students were sent an invitation to complete the questionnaire while they were out in the field. The participants were briefed on the objectives of the study as well as the significance of their responses. Those who participated were advised that there was no definitive answer that was either correct or incorrect, and that any and all responses that were provided would be valued and acknowledged. In addition, participation in the survey was entirely voluntary, and the opinions were kept anonymous, such that the researcher was the only one who knew the identities of the respondents [35]. It was determined that an exploratory factor analysis was done with the help of SPSS 24.0 software, in order to guarantee that the questionnaire was both valid and reliable.

2.3. Data analysis

This study uses the SEM technique as a data analysis technique using the help of Amos 25. SEM enables researchers to examine intricate theoretical models concerning causal relationships among variables [36]. This involves determining a series of structural equations that represent hypothesized relationships between variables and estimating the parameters of these equations using data. SEM can be used to test the direct and indirect effects of multiple predictors on a set of dependent variables, while considering measurement error and other sources of variation. This study chose the SEM technique because it has several advantages over traditional regression analysis, including the ability to model latent variables, test complex mediation effects, and handle missing data more effectively [37]. Prior to conducting further analysis, this study verifies that the data is devoid of normality and outlier issues. To ensure the validity and reliability of the results, confirmatory factor analysis (CFA) is carried out, in CFA, convergent validity is checked by looking at the loading factor value, composite reliability (CR) and average variance extracted (AVE). In CFA,

discriminant validity is also checked by ensuring that the square root of the AVE by the components should not exceed the relationship between them, then a check is carried out on the measurement feasibility model.

3. RESULTS AND DISCUSSION

3.1. Results

In this research, a validity test was conducted with the aim of evaluating how convincing and accurate the variables consisting of EC, EK, and ECOMP are. A factor loading of more than 0.50, an AVE value that exceeds 0.50, and a CR value that is greater than 0.70 are all obtained by each and every variable, as demonstrated by the findings of the validity test [38]–[40]. The outcomes of the convergent validity analysis in this study are presented in Table 1. The results suggest that the measurement model is strong, as each variable accurately represents the desired concept. The robust factor loadings, AVE, and CR values provide strong evidence that the items included in this study effectively capture the latent constructs of EC, EK, and ECOMP, thereby ensuring the trustworthiness of the results.

Table 1. Loading factor, CR, and AVE

Variable	Indicator	Factor loading	AVE	CR
EC	EC1	0.750	0.527	0.846
	EC2	0.746		
	EC3	0.803		
	EC4	0.553		
	EC5	0.752		
EK	EK1	0.799	0.615	0.889
	EK2	0.826		
	EK3	0.787		
	EK4	0.792		
	EK5	0.713		
ECOMP	ECOMP1	0.820	0.646	0.879
	ECOMP2	0.817		
	ECOMP3	0.790		
	ECOMP4	0.780		

According to the findings presented in Table 2, the square root of AVE has a higher value for each and every variable when compared to the correlation coefficient that is related with the variable. According to one interpretation, this demonstrates that the model has achieved discriminant validity. The term "discriminant validity" refers to a measurement concept that evaluates the level of comprehension by taking into account a number of signals that are connected to a number of different concepts [40]. Hair *et al*. [38] assert that The square root of the average variance that one of the structures possesses limits the interaction between its constituent pieces. This implies that each variable in the model exhibits a greater degree of distinctiveness in capturing its own concept in comparison to its association with other variables. Consequently, the model successfully differentiates between several constructs, confirming that each variable accurately measures its intended notion without substantial overlap with other constructs in the model.

Table 2. Discriminant validity

Variable	EC	EK	ECOMP
EC	0.726		
EK	0.143	0.784	
ECOMP	0.308	0.385	0.804

In CFA, researchers determine hypotheses regarding the relationship between latent variables (factors) and their indicators (questions or variables being measured). This hypothesis includes the magnitude and direction of the influence between factors and their indicators. After that, the CFA model is evaluated based on goodness-of-fit measures that include several statistics as shown in Table 3 [36], [41]. If the CFA model obtains good goodness-of-fit measures, it means that the model has a high level of feasibility, and the data collected supports the proposed factor structure. However, if the CFA model obtains poor goodness-of-fit measures, researchers must make some changes to the model, such as modifying the relationship between factors and indicators or removing indicators that do not support it, to achieve a better level of feasibility. By using CFA analysis, the research conducted can ensure that the conceptual model that has been proposed is in

accordance with the empirical data collected, so that the suitability between theory and reality can be strengthened. Based on the model feasibility test using IBM Amos 25, the model can be said to be a good fit as presented in Table 3.

Table 3. Goodness of fit index (GFI)

GFI	Cut off value	Results	Information
Chi square	Expected small	65.103	Good
Probability	>0.05	0.089	Good
Root means square error of approximation (RMSEA)	<0.08	0.034	Very Good
Chi-square minimum/degree of freedom (CMIN/DF)	<2.00	1.277	Very Good
Tucker-lewis index (TLI)	>0.90	0.992	Good
GFI	>0.90	0.958	Very Good
Adjusted goodness of fit index (AGFI)	>0.90	0.935	Good
Comparative fit index (CFI)	>0.90	0.983	Good

The last stage in the SEM method is hypothesis testing, where the hypothesis will be accepted (null hypothesis/H0 is rejected) if CR>1.96 critical ratio (CR) in the Amos output is one of the statistics used to assess the significance of the path coefficient or other parameters in structural equation analysis. CR is the ratio between the estimated parameter value and the standard error of the parameter. In structural equation analysis, we are interested in knowing whether the path coefficient between variables is significantly different from zero (null hypothesis). If CR is greater than 1.96 (at a significance level of 0.05), then the path coefficient is considered statistically significant and the null hypothesis can be rejected, meaning that the relationship between the variables is real and different from zero. Data regarding the hypothesis are presented in Table 4.

Table 4. Hypothesis test results

Hypothesis	Path	β	CR	p	Results
H_1	EC → ECOMP	0.197	3.545	0.001	Accepted
H_2	EC → EK	0.201	4.938	0.000	Accepted
H_3	EK → ECOMP	0.131	3.337	0.010	Accepted
H_4	EC → EK → ECOMP	0.030		0.016	Accepted

Referring on Table 4, it can be seen that H1: the influence of EC on ECOMP shows that there is an effect of EC on ECOMP. The p value less than 0.05 and the CR value exceeding 1.96 and indicate that the contribution is statistically significant and positive. Then for H2: the effect of EC on EK the CR value above 1.96 and a p value of less than 0.05 indicates that there is a significant contribution, and the third hypothesis, namely EK on ECOMP has a CR higher than 1.96, which is 3.545, and a small p value of less than 0.05 indicates the significance contribution of the two variables significantly. Referring on Table 4, the results of the analysis using Amos reveal that the p value is known to be <0.05, meaning that H4, namely there is a mediating role of EK on the influence of EC on ECOMP, with a large influence of 0.030. The findings suggest that EC not only has a direct positive impact on ECOMP, but also EK plays a key role in mediating this relationship. This indicates that the influence of EC on ECOMP is enhanced by the presence of extensive EK, emphasizing the crucial significance of comprehensive knowledge in promoting entrepreneurial skills and abilities.

3.2. Discussion

Based on the results, it was found that EC has a positive effect on ECOMP. This discovery aligns with prior research, such as those expressed by Sheidu *et al*. [42], who also found that EC contributed significantly to increasing ECOMP. The results of this study are further strengthened by Sánchez [43] which examined the effect of home EC on ECOMP, showing similar results in different contexts. Research by Heafner *et al*. [44] also supports this finding by showing a significant and positive relationship between the two variables. These results can be explained that EC provides a strong foundation of skills on economic and management principles, which are very important in developing ECOMP. Through economic learning, students not only learn theoretical concepts, but are also taught to apply this knowledge in practical situations, which ultimately strengthens their ECOMP [45], [46]. A deep understanding of economics enables students to identify business opportunities, make data-driven decisions, and manage resources effectively, all of which are important aspects of entrepreneurial competency [7], [30].

This study also shows that EC has a positive effect on EK. This result is in line with the research of Cao and Shi [47], Happ *et al*. [48], and Urbano *et al*. [49], all of which show a positive effect between EC and EK. This shows that EC not only equips students with theoretical knowledge, but also helps them build practical

knowledge that is relevant to the business world. This knowledge includes various aspects such as financial management, marketing, and business strategy, which are very important in the process of establishing and developing a business [25], [50]. Furthermore, students can cultivate the analytical and critical thinking abilities necessary to effectively manage risks and identify business opportunities through the study of economics [51]. Consequently, economic education not only enhances students' understanding of economic theory but also enhances their preparedness to enter the business world with confidence and competence.

Furthermore, this study shows that EK has a significant influence on ECOMP. This means that increasing EK directly contributes to increasing students' ECOMP. This discovery aligns with prior research, such as those expressed by Haltiwanger [52] and Al Mamun *et al.* [50], which show that in-depth knowledge of entrepreneurship is an important prerequisite for developing the competencies needed for success in entrepreneurship. By having strong knowledge of entrepreneurship, students are capable of discerning potential commercial prospects, formulating efficient strategy, and confronting obstacles with enhanced assurance [9], [53].

Another important finding of this study is the indirect effcet of EC on ECOMP through EK. This shows that although EC directly contributes to increasing ECOMP, its influence is strengthened through increasing EK. In this case, EK acts as a mediator that strengthens the relationship between EC and ECOMP. In other words, EC provides a strong knowledge base, which is then translated into better competence when the knowledge is applied in an entrepreneurial context [54], [55]. The results of this study can also be seen from the perspective of entrepreneurship education which emphasizes the importance of contextual learning [56], [57]. When students receive a good EC, they not only learn basic concepts, but also how to apply that knowledge in a real business context [48], [58]. This develops more applicable EK, which in turn increases ECOMP [52], [59]. This suggests that EC should be designed not only to convey information, but also to develop skills relevant to the real business world.

4. CONCLUSION

The study examining the effect of EC on the acquisition of EK and competence among vocational high school students found that EC has a positive effect on enhancing students' EK and competence, both directly and indirectly. By receiving a comprehensive EC, students can cultivate a more profound comprehension of economic principles, financial administration, and other pertinent facets within the realm of business. The results of the four hypotheses indicate a strong and statistically significant correlation. This suggests that students who obtain high-quality EC are more likely to possess both EK and ECOMP, which are valuable assets in navigating the corporate environment. This suggests that having a grasp of economic and business principles helps motivate students to cultivate their entrepreneurial skills. Therefore, the findings of this study have significant ramifications for the field of teaching and learning in vocational high schools and other educational establishments. Enhancing the caliber of EC by incorporating a strong emphasis on cultivating EK and skills can equip students to confront the challenges posed by the progressively intricate business environment. Furthermore, it is imperative to offer EC in a manner that integrates theoretical concepts with practical applications in the corporate realm. This approach enables students to cultivate essential abilities that are pertinent to their future success as entrepreneurs.

It is essential to acknowledge the various limitations of this study. The research was carried out on a distinct cohort of vocational high school students in Jakarta, Indonesia. Hence, the generalizability of the findings to all vocational school students may be limited, as the influence of predictor variables can change between locations with distinct socio-economic and cultural contexts. In addition, this study exclusively examines the influence of EC on EK and competence, without considering other variables that may also play a meaning role in improving students' ECOMP. Therefore, it is advisable for future researchers to expand the sample size by incorporating vocational students from different regions in Indonesia. This will improve the comprehensiveness of the study and raise the generalizability of the results. Moreover, it is recommended to include study variables such as entrepreneurial motivation, family support, and company practice experience in order to gain a more comprehensive understanding of the elements that influence the ECOMP of vocational high school students.

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AUTHOR CONTRIBUTIONS STATEMENT

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C : **C**onceptualization
M : **M**ethodology
So : **So**ftware
Va : **Va**lidation
Fo : **Fo**rmal analysis
I : **I**nvestigation
R : **R**esources
D : **D**ata Curation
O : Writing - **O**riginal Draft
E : Writing - Review & **E**diting
Vi : **Vi**sualization
Su : **Su**pervision
P : **P**roject administration
Fu : **Fu**nding acquisition

CONFLICT OF INTEREST STATEMENT

Regarding the research, writing, and/or publication of this paper, the authors declared that there are no potential conflicts of interest that could arise.

INFORMED CONSENT

The authors have obtained informed consent from all individuals included in this study.

ETHICAL APPROVAL

The Ethical Committee of the Faculty of Economics, Universitas Negeri Jakarta, Indonesia, has granted approval for this study on 29 March 2023 (Ref. No 923/UN39/HK.02/2023).

DATA AVAILABILITY

The data that support the findings of this study are available from the corresponding author, [S], upon reasonable request.

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