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Promoting Students' Entrepreneurial Self-Efficacy in Vocational High School: Scale Development

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Abstract

Students' entrepreneurial self-efficacy (ESE) should be known by school administrators to raise the quality of students in entrepreneurship. Entrepreneurial self-efficacy research in the past was dispersed. As far as this study is concerned, this is what it has to offer and a novel approach that could lead to future research work. Scale development for students in vocational school contexts, as well as a determination of item dimensionality to measure ESE construct, will be pursued by this study. Seven panelists were used for content and face validity, while 100 students in 23 vocational high schools (VHS) were administered questionnaires to measure construct validity using the Exploratory Factor Analysis (EFA). Content Validity Index (CVI), which consists of both I-CVI and S-CVI, was used to assess the initial items' content validity. However, the face validity using Fleiss Kappa Index (FKI). The result for S-CVI is 0.917, FKI is 0.432, the I-CVI met the criteria for 32 items. Four sub-constructs of ESE were identified by the EFA with a total of 78.788 percent of the total variance explained (TVE) in this study. ESE's values can be accurately measured with this instrument, as the researchers discovered during the course of the investigation. Governments, school boards, and other academics may be interested in the study's findings. By doing so, all parties will be able to assess what steps should be taken to raise standards for students in entrepreneurship beyond COVID-19.

Keywords: Entrepreneurial Self-Efficacy, Exploratory Factor Analysis, Modified Delphi Method, Scale Development, Vocational High School.

Introduction

There were many job losses during the Covid-19 period, the company ceased operations, and unemployment was widespread. An entrepreneurial path is becoming more accessible to young people, including graduates of vocational high schools (VHS). Despite the fact that the government has mandated that vocational high students learn entrepreneurship, entrepreneurial self-efficacy (ESE) remains a concern for VHS graduates. As a result, the quality of recent high school graduates must be improved, as well as their mental readiness for life after graduation. Entrepreneurial self-efficacy needs to be assessed and evaluated by school administrators in order to help them make better improvements in order to improve the quality of students who have entrepreneurial self-efficacy or are mentally prepared for a career as a business owner. There has been a steady increase in the last two decades of research into entrepreneurial self-efficacy. However, this research in the past was dispersed among researchers from a variety of academic disciplines (Newman et al., 2019). Entrepreneurial self-efficacy, on the other hand, has emerged as a critical psychological component in entrepreneurial research (Miao et al., 2017).

Newman et al (2019) stated that the results of past studies showed that ESE measurement remain inconsistencies in the measurement and has to be revised, and appropriate with the respondent, especially for students in vocational high school (VHS) context. In evaluating students' entrepreneurial self-efficacy, researchers developed new forms of the instrument. For students at this level, most instruments that have been developed previously are insufficient. Past studies suggested that it is important to look at how ESE develops in the early years of a person's life before they begin their actual work career. In this view, a person's vocational development begins in adolescence and continues through adulthood (Newman et al., 2019). This novel has the potential to serve as a springboard for further investigation in this area. This research focused on the evolution of the ESE scale among students in a VHS environment. In this study, the focus is on determining the ESE and scale development components' dimensionality. The researchers used the acronym ESE for entrepreneurial self-efficacy and VHS for vocational high school in order to make their findings more readable.

As a result of the exploratory factor analysis (EFA) of the ESE construct, researchers are becoming more interested in early measures of construct validity. New instruments for ESE have been created by blending the idea of incorporating and making the operationalization definition from that idea in this work. Students at VHS are a perfect fit for the scale's development.

Literature Review

The first phase is when the researchers discovered the idea through the use of keywords from previous studies, which may subsequently be employed for scale development. According to Nguyen (2020), ESE is a process of developing an individual's entrepreneurial capability so that they have the belief and preparedness to pursue a career as a business owner. In addition, perceived self-capability in identifying and exploring business prospects, the ability to explore and learn about new things, the ability to manage a firm, the ability to build and develop business partners, and mental maturity as an entrepreneur are taken into consideration. Hsu et al (2019) stated that ESE is defined as the belief in one's ability to accomplish entrepreneurial tasks and activities. Added by Yuliatika et

al (2017), ESE refers to a person's confidence in another's ability to complete a task in order to achieve a specific objective. ESE, according to Mcgee et al (2009), refers to a person's belief in their ability to successfully establish a business venture. Furthermore, Wilson et al (2008) emphasized that the core of ESE is individuals' self-perceptions of their skills and abilities, which they defined as follows.

The concept of self-efficacy is used in entrepreneurship to define goals and control beliefs. It reflects a person's perception of their own abilities based on their performance and attentiveness. When people judge their capacity to finish a task or do an activity that is required in order to achieve a specific result, they are said to have "self-efficacy." All of these abilities, including adaptability, intellect, self-confidence, cognitive capacity, and the ability to act in difficult situations, are ones that people place a lot of stock in (Marta & Kurniasari, 2019).

In other terms, based on past expert judgments, the researchers can compare keywords and conclude that ESE refers to a person's belief in their own abilities and capabilities to do entrepreneurial duties and activities in order to attain goals in the most effective manner. The researchers then did a synthesis review of ESE sub-constructs. Additionally, the researchers noticed that some studies employ sub-constructs developed by prior researchers, while others alter existing sub-constructs, and yet others develop their own bespoke sub-constructs. The researchers based their conclusions on a review of the literature.

ESE was conceptually different in many respects. The features of ESE were employed as a distinct conceptual framework. An explanation for how this study fills in the measuring gap for ESE and corresponds to the features of students in VHS level was provided by the researchers in the introductory section. As a result of previous research' ideas being applied differently, there is a conceptual gap. As a consequence, this issue might serve as the basis for the development of a new concept that fills a need. Risk-taking and personality traits, according to previous research, are distinct phenomena (Vemmy, 2013; Lauriola & Levin, 2001). In contrast to earlier research, which found a relationship between risk-taking behavior and personality traits as suggested by FFM models (McGhee et al., 2012), this one found a link between risk-taking behavior and personality features (Aklin et al., 2005). After evaluating prior studies, the researcher noticed a discrepancy in the use of personality traits and risk-taking as constructions and sub-constructs. However, in this study, risk-taking is included as a sub-construct of personality traits in the ESE construct to cover this gap in research. Entrepreneurial self-efficacy and its sub-constructs may be re-examined in light of this research.

ESE sub-constructs based on ESE sub-constructs from previous studies were integrated. ESE's subconstructs include personal traits, skills, establishing a relationship with investors, and knowledge. The conceptual gap we currently face is the outcome of previous research covering a wide variety of concepts. As a result, a new notion might be developed to fill a need in the literature.

Research Methods

Data Collections

Data regarding pandemic covid-19 was gathered over the online for the purposes of this investigation. The information gained in this study will be useful in future studies. Delphi and Exploratory Factor Analysis were employed by the researchers in the development of new scales. As Verhagen et al (1998); Carpenter (2018) discovered that the Delphi method is utilized to produce new items, and EFA is used to analyze the proposed scales after a literature review, conceptual definition, exploratory methodological sub-constructs, and items are created. Added by Custer et al (1999), a literature review synthesis can be included in the modified Delphi technique. When developing new instruments, EFA can also be used (Tavakol & Wetzel, 2020). For the purpose of evaluating the validity of the EFA concept, questions and answers were employed in questionnaires that were sent and collected using Google Form. For content and face validity, researchers used online data from seven panelists.

Population and Sample of The Study

The participants in this study are students in grades 11 and 12 of Jakarta's twenty-three (23) public VHSs that are part of the Entrepreneurship Development School program. Students in the eleventh and twelfth grades were the subject of this study, which had a sample size of 100 participants. The following study will require a sample size of at least 100 EFAs to be conducted (Pearson & Mundfrom, 2010). The samples were chosen by the researchers through the use of multistage sampling. The samples used in the EFA technique, on the other hand, are distinct from those used in the field study.

Modified Delphi Method and Panelists

During this investigation, seven panelists were given the opportunity to check the 36 first initial items. It is critical for panelists to remain anonymous during the Delphi process, which is part of the procedure (Taylor, 2020). During this procedure, it is possible to check for face and content validity. In this updated Delphi technique, there were three rounds, which was the total number of rounds in the method. Three rounds of Delphi, as previously stated by McDonald et al (2009), appear to be quite successful and beneficial. After completing the content validity checks in the first and second rounds, the face validity checks were completed in the third round.

Following that, the study proceeded on to the consensus phase, which included the content validity index (CVI) and the Fleiss Kappa Index (FKI). The items on the list that fit the criteria would not be removed from consideration. A high level of credibility, according to Polit et al (2007), is demonstrated by an item with an I-CVI of 0.78 or higher and an S-CVI of greater than 0.800. One of the seven panelists, on the other hand, was not in agreement with this study since it utilized a CVI value of at least 0.857. This study employed FKI in the third round to ensure that the consensus outcome seemed to be accurate. When the agreement is less than 0.40, the FKI is considered "poor," when the agreement is between 0.40 and 0.75, it is considered "good," and when the agreement is greater than 0.75, it is considered "excellent." The Fleiss Kappa Index (FKI) is calculated according to the following formula:

$$\hat{\kappa} = \frac{p_o - p_e}{1 - p_e} \qquad p_0 = \frac{1}{N}\sum_{i=1}^{N}\left(\frac{1}{n(n-1)}\sum_{j=1}^{k}\left(n_{ij}^2 - n_{ij}\right)\right) \qquad p_e = \sum_{j=1}^{k} p_j^2$$

As a result, once the Delphi process had updated the 36 initial items, there were 32 items in EFA for ESE while the procedure was in operation.

Exploratory Factor Analysis (EFA)

The first stage of this inquiry should involve using factor analysis to determine whether or not the discrepancies are responsible for the concept. The second stage involves determining the stability and consistency of the queries. EFA is a new factor that was introduced by Hoque & Awang (2016). It explores the relationships between items in each sub-construct, looking for clusters of items with sufficient ordinary variation to qualify as factors.

For the purposes of determining sample adequacy prior to estimating the specific scenario ratio, the KMO and Bartlett's test of sphericity were utilized in the current study. If the sphericity test yields a P value less than 0.05 in this situation, factor analysis should be performed. TVE was suggested as an item extraction approach by Awang (2015) in order to lower the quantity of items to a manageable level before additional research could be undertaken on them. Following an examination of a rotational component matrix, only components with factor loadings larger than 0.5 were chosen for further consideration.

Research Instrument for EFA

The originality of this work is the development of ESE on a greater scale, namely ESEQ. It was discovered that the seven-point interval scale, which is more forceful than some other scales used in social and educational research, was a good match for the thirty-two (32) items studied in this current research. The seven-option scale, according to Preston & Colman (2000), may outperform the five-point scale when it comes to consistency of participant replies in a survey, owing to the wide range of responses available on the survey's idea. Because it provides more possibilities, the seven-point scale will better serve people's objective reality because it will provide them with more options. ESE sub-constructs are specified in terms of operational terminology, as well as the keywords that were used to generate them, as shown in Table 1. For the items, the operational definitions of the four sub-constructs of ESE were utilized as the basis for their development.

Table 1. Operational Definitions and Distribution of 32 Items after Modified Delphi for Four Sub-constructs of ESE

Operational Definition of ESE sub-constructs	Items Label
Own skills refers to individual ideas to produce new things as a consequence of self-exploitation.	ESE1
	ESE2
	ESE3
	ESE4
	ESE5
	ESE6
	ESE7
	ESE8
	ESE9
	ESE10

Operational Definition of ESE sub-constructs	Items Label
Personal traits are inner and exterior characteristics of an individual that are related to confidence and risk-taking in the context of business.	ES11
	ESE12
	ESE13
	ESE14
	ESE15
	ESE16
	ESE17
	ESE18
Initiating investor relationships refers to individuals who feel that they can create opportunities, relationships, and sources of funding from investors.	ESE19
	ESE20
	ESE21
	ESE22
	ESE23
	ESE24
	ESE25
In order to remove barriers to entrepreneurship, **gained knowledge** refers to the utilization of all available knowledge resources, educational background, and life experiences.	ESE26
	ESE27
	ESE28
	ESE29
	ESE30
	ESE31
	ESE32

Results

Demographic Profile of Samples

This part presents the demographic profile such as gender, level of class, parents' occupations, and expereince in running business.

Table 2 Demographic Profile of Respondents (n=100)

Variables	Categorized	Frequency	Percent
Gender	Male	31	31%
	Female	69	69%
Class	11	53	53%
	12	47	47%
Parents' occupation	Entrepreneur	25	25%
	Non-entrepreneur	75	75%
Running Business	Ever	33	33%
	Yes	5	5%
	No	62	62%
	Total		**100%**

The Modified Delphi Results

Since items did not fit the criteria of I-CVI and because panelists had recommended adjustments to the ESEQ, four items (ESE3, ESE25, ESE29, and ESE30) were eliminated from the 36 original items of the ESEQ, according to the agreement reached during round 1. At this moment in round one, the S-CVI was 0.917>0.800, indicating a significant difference. In the first round, all of the panelists agreed and accepted the agreement reached throughout the discussion.

Before starting Round 2, questions that had been altered were presented to the panelists for their responses. Though everyone agreed that certain components needed to be altered in Round 2, the CVI was achieved. The panelists unanimously agreed that the second round of consensus was the best option. In the third round, the FKI was used, and the results were 0.432 percent. It indicated that a good agreement or a satisfying conclusion had been reached in the third round.

Exploratory Factor Analysis Results

An EFA was conducted with one hundred (100) students in order to identify the underlying sub-constructs and items of the ESE as well as to confirm the instrument's quality and reliability. Within the ESE construct, there were four sub-constructs and 32 newly developed items, which were all examined in this study. To sum it up, there are 32 separate sub-constructs items, consisting of 9 personal traits items, 9 own skills items, 7 initiating investor relationship items, and 7 gained knowledge items. This is demonstrated in Table 3 by the results of the KMO and Bartlett's tests.

Table 3. KMO and Bartlett's Test for the items of ESE

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.894
Bartlett's Test of Sphericity	Approx. Chi-Square	4324.014
	df	496
	Sig.	.000

According to the data in Table 3, the KMO score is 0.894, which is higher than the ideal threshold of 0.06. A significant portion of this study's findings were based on Bartlett's Test, which was used to establish the relevance and validity of the respondents' responses to the subject at hand. If the findings of Bartlett's Test are less than 0.05, factor analysis is considered acceptable. Table 3 shows that the significant value for Bartlett's Test is 0.000, which is less than the necessary value of 0.05. As explained by Zainudin Awang (2015), if the KMO and Bartlett's significance are near to zero, it indicates that the data is sufficient and appropriate to proceed with the reduction operation. At its most basic level, TVE is a method of condensing a large number of objects into a manageable amount. It is in this manner that eigenvalues larger than 1.0 are divided into various sub-constructs (Zainudin Hj Awang, 2012).

Table 4. TVE for ESE

Total Variance Explained									
	Component			Component			Component		
Component	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	15.538	48.556	48.556	15.538	48.556	48.556	7.997	24.989	24.989
2	4.120	12.876	61.432	4.120	12.876	61.432	6.680	20.875	45.864
3	3.507	10.960	72.392	3.507	10.960	72.392	5.944	18.576	64.440
4	2.047	6.396	78.788	2.047	6.396	78.788	4.591	14.348	78.788
5	.929	2.904	81.692						
6	.817	2.553	84.244						
7	.561	1.753	85.998						
8	.518	1.618	87.616						
9	.446	1.395	89.011						
10	.385	1.204	90.215						
11	.365	1.141	91.356						
12	.331	1.033	92.390						
13	.313	.978	93.368						
14	.268	.836	94.204						
15	.241	.753	94.957						
16	.228	.713	95.670						
17	.190	.595	96.265						
18	.168	.526	96.791						
19	.160	.501	97.291						
20	.151	.472	97.763						
21	.135	.422	98.185						
22	.116	.363	98.548						
23	.092	.288	98.836						
24	.088	.275	99.111						
25	.077	.240	99.351						
26	.062	.195	99.546						
27	.053	.165	99.711						
28	.031	.096	99.807						
29	.023	.071	99.878						
30	.017	.052	99.930						
31	.013	.040	99.970						
32	.009	.030	100.000						

Extraction Method: Principal Component Analysis.

There were four sub-constructs of the ESE construct that had eigenvalues of 15.538, 4.120, 3.507 and 2.047, as indicated in table 4, as shown by the EFA results. Subsequent research will focus on the four sub-constructs that have been identified. Table 4 above shows that TVE is also 78.788 percent.

Table 5. Rotated Component Matrix of ESE

Rotated Component Matrix[a]				
	Component			
	1	2	3	4
ESE1		.898		
ESE2		.757		
ESE3		.913		
ESE4		Deleted		
ESE5		.723		
ESE6		.884		
ESE7	.755			
ESE8	.713			
ESE9		Deleted		
ESE10		Deleted		
ESE11	.704			
ESE12	.732			
ESE13	.792			
ESE14	.778			
ESE15	.766			
ESE16		.855		
ESE17		.862		
ESE18		.829		
ESE19			.839	
ESE20			.791	
ESE21		Deleted		
ESE22			.749	
ESE23		Deleted		
ESE24			.832	
ESE25			.782	
ESE26				.948
ESE27		Deleted		
ESE28				.885
ESE29		Deleted		
ESE30				.930
ESE31				.912
ESE32				.861

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.[a]
a. Rotation converged in 6 iterations.

As indicated in Table 5, four sub-constructs were obtained using the EFA technique, and they are as follows: A factor loading has been applied to each of the components of each sub-construct. The items in this study will be restricted to those with factor loadings larger than 0.5 for newly produced items as a result of this decision (Zainudin Awang, 2015). Item numbers 4, 9, 10, 21, 23, 27, and 29 (seven items) will not be studied further because of their high factor loadings or because they were discovered to be most highly loaded on the

incorrect factor. Zainudin Hj Awang (2012) determined that factor loadings larger than 0.5 should be kept for future research and that items with the greatest loading on the incorrect factor should be removed from consideration (Churchill and Bygrave, 1989). Items having a loading greater than 0.50 will be considered for further examination within the ESE's four sub-constructs, of which there are twenty-five (25) in total (see table 5).

Reliability Analysis

The reliability analysis of a set of measuring instruments is one way for assessing the accuracy of a set of measuring instruments. Cronbach's Alpha is a well-known statistic that is used to evaluate the trustworthiness of a product. According to Taber (2018), the instrument should be taken into consideration in this study because of its high Cronbach's Alpha of 0.70.

Table 6. Reliability Statistics for the four sub-constructs of ESE

Sub-construct	Number of items in a sub-construct	Cronbach's Alpha
Personal traits	8	0.960
Own skills	7	0.940
Initiating investor relationships	5	0.946
Gained knowledge	5	0.961

As shown in Table 6, the Cronbach's Alpha for each sub-construct is calculated and has a high level of reliability: 0.960 for personal traits, 0.940 for own skills, 0.946 for initiating investor relationships, and 0.961 for gained knowledge. It is clear from these data that all four of ESE's sub-constructs have met their dependability requirements. Consequently, Table 6 shows that the extracted components and their corresponding items are accurate and adequate for measuring the ESE construct. As a result, the field research may use these items to collect data.

Conclusions

A new scale of entrepreneurial self-efficacy (ESE) was constructed in this study, it was discovered. The updated Delphi method findings showed that the S-CVI is 0.917, the FKI is 0.432, and the I-CVI meets the requirements for 32 items, 4 items did not achieve the requirement. The EFA results of this study were used to develop a framework that yielded four ESE sub-constructs. ESE encompasses a wide range of factors, including an individual's personal traits, own skills, initiating investor relationships, and gained knowledge. This study's 25 new items after EFA can be used to measure these subconstructs. It's safe to say that the new ESE scale is accurate because all of the samples have the same results. Then, the EFA found four sub-constructs of ESE accounting for 78.788 percent of the TVE. The researchers determined during their examination that this equipment can correctly assess ESE's values. In our opinion, this study contributes to the expansion of ESE assessment, particularly at the high school vocational level. It is also important to note that all of the study's results and conclusions are the result of the researchers' own observations and theories. Past researches using a variety of theories resulted in gaps in the research, which were uncovered throughout the assessment phase. However, there are considerable differences of opinion as to how to go about standardizing the instruments used to assess ESE. By starting with this condition, researchers may build a new concept that fills a gap in the existing body of knowledge and then scaling it up. The conclusions of this study may be of interest to governments, school

boards, and other academics. As a beginning point, however, this research might lead to further studies on the scale of ESE and its sub-constructs.

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