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Partial Least Square (PLS) Model Investigation for Determining Influencing Factors of Entrepreneurship Collaborative Learning Effectivenessin Indonesia Higher Education

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Abstract: This study is aiming to investigate influencing factor of entrepreneurship collaborative learning performances by using Partial Least Squares Structural Equation Modeling approach (PLS-SEM). A hypothetical conceptual model for improving entrepreneurship learning performance develop based on the previous study, which composed of four enablers called university's vision and mission, entrepreneurial background lecturer, strong culture and rewards system.The methodology used to test the conceptual model was delivering the questionnaire survey to 72 (seventy two) lecturers in business field. The unit analysis of this study is the universities, both public and private universities in South of Tangerang. Sample was selected using simple random sampling. The questionnaires were developed from the past studies in similar area of entrepreneurship in higher education, before distributed to the respondents. The findings from this study provide insight to construction that the relationships of variable vision and mission to effectiveness have path coefficient value 0.195 and the lecture background is 0.040. Meanwhile, reward and culture shows stronger influence to Entrepreneurship collaborative Learning Effectiveness with the patch coefficient values are 0.296 and 0.335.

Keywords: Entrepreneurship, collaborative Learning Effectiveness,Higher Education, PLS (Partial Least Square)

I. INTRODUCTION

As a new concept of international education, entrepreneurship could generate entrepreneurial ideas, knowledge and also skills of entrepreneurial talent as the goal. Those are also includes teaching the basic of entrepreneurship and entrepreneur skill and entrepreneurship culture and entrepreneurial mental health and business practices of training. (Ge, 2015). The existence of the entrepreneurship course is intended to increase students' insight into the world of entrepreneurship as well as motivate them to get involved directly in the business perspective, so that they can contribute in improving the economy of the Indonesian. (Krisnawati, 2017), also stated that the entrepreneurship course designs to help students creating a business, through preparing a business plan including its prototype. Some of universities even more enrich the students in entrepreneurship course with training, doing three months internship in a small and medium enterprise and implement their business plan into a real business. The previous study on entrepreneurship learning model (Krisnawati, 2017) revealed that there are four aspects that could influence effective learning for entrepreneurship as explained below

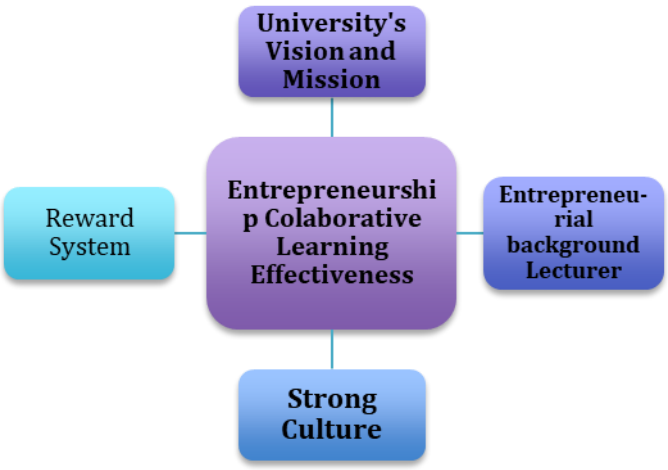


Figure 1. Collaborative Entrepreneurship Learning Model

The above figure describes that the emergent role of each aspect to make the model become effective in the higher education field are university's vision and mission, entrepreneurial background lecturer, strong culture and rewards system. However, the above model has not been measured through quantitative approached yet. The quantitative approaches will determine the influencing factors of each enablers to improve performance of entrepreneurship learning in higher education. However, the strategic implementation in particular circumstances of higher education is highly essential to be formulated too. Profit sharing on the other hand, does not include in the model since it can be done by the tenants. As recommended at the previous research before, It is necessary to examine the model for further applicable model in the real field of education practice. How the university could implement the model to achieve effective learning by integrating current entrepreneurship courses and business incubator.

II. The Current Implementation Challenges Facing Entrepreneurship Education in Higher Education

The higher education system is necessary to promote and succeed the entrepreneurship program. The Indonesian government themselves have been supporting this program since 2009 through some private universities, polytechnics and state universities such GadjahMada University, Bandung Technology Institute, Indonesia University, Airlangga University, Bogor Agriculture Institute, and Diponegoro University (Ardianti, 2009).In most universities, entrepreneurship program designs to assist students making a business, through preparing a business plan, creating the product including its prototype. Some of universities even provides the students with training, doing three months internship in a small and medium enterprise and implement their business plan into a real business. For those who gained grants from government, they may use the grant to conduct further activities in entrepreneurship including involving experts as facilitators.The initial stage of entrepreneurship implementation is facing many challenges, such as: entrepreneurship education concept behind a narrow range, low-tech entrepreneurship, leading to entrepreneurship education and professional education, learning the basics of touch. (Ge, 2015) It was founded as well that there is a contradiction between the limited and unlimited entrepreneurship education needs of educational resources. The resources are including entrepreneurship lecturer with a practice-based background, infrastructure, teaching equipment and other basic facilities construction and curriculum development, textbook construction and also high-quality teaching resources. The lecturers and culture of entrepreneurs are considered become the most challenging factors in observed universities.

III. Research Method

The study adopts quantitative method using survey questionnaire. There are five main sections in this section: (1) sampling procedure, (2) data collection, (3) questionnaire development, (4) measurement of the variable (4) data analysis and (5) summary of the hypothesis

3.1. Sampling Procedure

The unit analysis of this study is the universities in South of Tangerang. The study sample includes both public universities and private universities. The list of university provided by Indonesia Ministry of Education is used as sampling frame and sample were selected using simple random sampling. The study choose South of Tangerang as the

sample because of it's growing area and the most populated than other areas in the Jabodetabek (Jakarta, Depok, Tangerang and Bekasi). With the most growth population the Jabodetabek, South of Tangerang comprise public and private university spread urban structures from cities, suburban residential areas and rural areas. Regardless of the urban structure, the universities in South of Tangerang implement entrepreneurship subject and/or provide the incubator business for their students.

3.2. Data Collection

Data was collected using survey questionnaire self-administered and mailed. Questionnaires were sent to 72 business lecturers in South of Tangerang. Focus group discussion was conducted to gain the information from the expertise about implementation of entrepreneurship subjects and provide the objectives of the research. In addition, the questionnaire distributed to them. In order to conducted focus group discussion, term of reference (TOR) was made to provide the information about the FGD's content to the respondents.

Each FGD's participant received 10 questionnaires together with cover letter and also addressed to the lecturers who teach entrepreneurship subject and stuffs or employee who involve in the business incubator in their university as they are considered as suitable respondents as they involve directly on the entrepreneurship subject and business incubator activities in their university. To the university that not sent their representative in the focus group discussion, therefore such as, Bina Nusantara University and Pembangunan Jaya University were visited and collected by the researchers while, remaining universities were emailed.

3.3. Questionnaire Development

The questionnaire were initially developed from previous literature and established measurement. Questionnaire's questions is bilingual adopting the English and Indonesian languages in order to avoid misunderstanding on the question, except the background of the respondent that use Indonesian language. The questionnaire is divided into six sections. (1) respondent background, (2) vision and mission the university to the entrepreneurship subject, (3) lecturer background, (4) rewards, (5) effectiveness implementation of entrepreneurship subject, (6) Culture

3.4. Measurement of Variable

3.4.1. Vision and mission the university to the entrepreneurship subject.

Vision and mission the university to the entrepreneurship subject refers to entrepreneurial curriculum, the availability infrastructure and equipment to support entrepreneurship learning and learning and growth. Vision and mission the university to the entrepreneurship subject was measured by Romina Ifeona Asiyai (2013) and Al Nsour (2012). There are six items to measure vision and mission the university to the entrepreneurship subject namely,

1. Establishment of entrepreneurship program in the university
2. University infrastructure to support entrepreneurship learning
3. Curriculum design
4. Providing grants
5. Development learning model
6. Academic growth

Respondent were asked to evaluate agree or disagree that vision and mission of university relate to implementation entrepreneurship subject with five likert scale anchoring from 1 = strongly disagree and 5 = strongly agree

3.4.2. Lecturer Background

Lecturer background represent as the experience of the lecturer to teach entrepreneurship subject in the university and, content of entrepreneurship subject. Lecturer background was measured by Oi Yeng Ket et al., (2011). There are four items to measure lecturer background such as,

1. Lecturer experience
2. Delivery materials which in line with the current practice
3. Ability lecturer to encourage the student
4. Lecturer experiences in the current business practices

Respondent were asked to evaluate agree or disagree that lecturer background relate to implementation entrepreneurship subject with five Likert scale anchoring from 1 = strongly disagree and 5 = strongly agree.

3.4.3. Strong Culture

Strong culture refers to uncertainty avoidance, human orientation, assertiveness, performance orientation and power distance. Basis to measure strong culture was adopted from Raymon (2016) with 5 items such as

1. Social and norms
2. Rewards system
3. Assertive and aggressive
4. Equally treatment among the students
5. Environment influences

Respondent were asked to evaluate least universally desirable and the most universally desirable to implement entrepreneurship subject with five Likert scale anchoring from 1 = the least universally desirable and 5 = most of universally desirable.

3.4.4. Entrepreneurship collaborative Learning Effectiveness

The dependent of this study is Entrepreneurship collaborative Learning Effectiveness.It refers to intention and desire for venture creation, knowledge of venture creation and confidence venture creation. The effective implementation entrepreneurship was measured by M. Lee. Sang et al., (2005). There are 5 items to measure effective implementation of entrepreneurship

1. Intention to lunch start-up business
2. Running start up business is better than find another jobs
3. Changing mindset
4. Knowledge and skills
5. Confidence personality

Respondent were asked to evaluate agree or disagree that lecturer background relate to implementation entrepreneurship subject with five Likert scale anchoring from 1 = strongly disagree and 5 = strongly agree

3.5. Data Analysis

Data was analysed using both SPSS 22 and PLS software. The hypothesis are tested using structural equation model (SEM) using PLS. SEM represents a set multivariate technique that allows simultaneous study of several causal relationships between endogenous and exogenous variables. Due to small sample size, the variables of the study are treated as a manifest variable using summated scores. In addition, PLS-SEM applied. SEM-PLS is used to develop theories in exploratory study. It is focusing on explaining the variance in the dependent variables when examining the model. In addition, it works efficiently with small sizes and complex models and makes practically no assumption about underlying data (Hair and Joseph, 2014). Before proceed to hypothesis testing, SPSS 22 was used to analyse data to suit the assumption of PLS-SEM. Descriptive analysis was conducted to measure the distribution of respondent in the study. Furthermore, it is cleaning process to ensure the reliability of data entering.

IV. EMPIRICAL FINDING

This section discusses the survey results which are divided into five sections. The first section discusses the profile of respondents. The second section describe descriptive analysis of the study.

4.1. Profile Respondent

Respondent profile was formed to observe the characteristic of the study's respondent. Table 1 shows profile of respondent. Respondent are mostly private university with 100% and no respondent from public university with 0%. The position held by respondent is used to determine the reliability of answer provided in the questionnaires. The questionnaires are mostly answered by respondents with position of lecturer (77.8%). This is followed by staff with structural position (13.9%), others (4.2%), staff unit of entrepreneurship (2.8%) and staff incubator (1.4%). Since the lecturer is directly involved to transfer knowledge of the entrepreneurship to the student therefore, the answer provided are considered reliable and representative of the actual transfer knowledge of the entrepreneurship.Most of the respondent (44.47%) have worked 2 to 5 years. Specifically working tenure more than 10 years is 22.2%, less than 2 years is and 6 to 10 years is 15.3%. Respondent who master's graduated 70.8% is highest than respondent Phd's graduate with 25% and undergraduate with 4.2%.

Table 1 Profile Respondent

Type of University	*Frequency*	*Percent*
Public University	0	0
Private University	72	100
Position		
Lecturer	56	77.8
Staff Unit of Entrepreneurship	2	2.8
Staff Incubator	1	1.4
Staff with Structural Position	10	13.9
Others	3	4.2
Working Tenure		
Less than 2 years	13	18.1
2 until 5 Years	32	44.4
6 until 10 Years	11	15.3
More than 10 Years	16	22.2
Education		
Phd	18	25
Master	51	70.8
Undergraduate	3	4.2

4.2. SEM-PLS (Partial Least Square)

The research is used structural equation model (SEM) with partial least square (PLS). According to Byrne (2010), structural equation modelling (SEM) is a statistical method that takes a confirmatory i.e., hypothesis-testing approach to analyses structural theory bearing on some phenomenon. This study used PLS-SEM to find the relationship between exogenous and indigenous and also it predicts the construct variable of the study (Garson, 2016). Partial least square (PLS) enables to analysis simultaneously up to 200 indicator variables and also allowing the examination of extensive interactions among moderator and latent predictor variable indicator (Al-Ghatani, Geoffrey, & Wang, 2007). PLS-SEM be able to handle multicollinearity among the independents; robustness in the face of data noise and missing data; and creating independent latent variables directly on the basis of cross-products involving the response variable(s), making for stronger predictions. Furthermore, PLS-SEM serves prediction purposes better when sample size is small (Garson, 2016). The study measure the effect the entrepreneurship education attributes that lead to effectiveness the implementation of entrepreneurship education.General standard of PLS-SEM must be achieved to access the indicator of good fit. There are parameter to test validity of the variables in the PLS-SEM (Chin, 2010): Convergent validity with factor loading (Outer loading) must be greater than >0.7. Discriminant validity that indicates by AVE (Average Variance Extracted) must be greater than >0.5. Three parameters to measure the reliability i.e., cross loading must be greater than >0.7 in one variable, Cronbach alpha is greater than >0.6 and Composite reliability is greater than >0.6.

4.2.1. Outer model analysis

The outer model is the measurement model consisting of the indicators the paths connecting them to their respective factors. There are two models namely, outer model loading and outer model weights and Both weights and loadings are output for both reflective and formative models (Garson, 2016). Outer model loadings appear in the table below. They may be considered a form of item reliability coefficients for reflective models: the closer the loadings are to 1.0, the more reliable that latent variable. By convention, for a well-fitting reflective model, path loadings should be above .70 (Hair, Hult, Ringle, & Sarstedt, 2014). Note that a loading of .70 is the level at which about half the variance in the indicator is explained by its factor and is also the level at which explained variance must be greater than error variance. On the value 0.70 as a criterion for minimum measurement loadings.Outer loading (factor loading) uses to measure convergent validity of the variable in the research model. According to Chin (2010) the outer loading should exceed than 0.70.

Table 3 – Discriminant validity

Variable	Culture	Effectiveness	Lecturer Background	Reward System	Vision & Mission
Culture 1	0.725				
Culture 2	0.803				
Culture 3	0.728				
Culture 4	0.855				
Culture 5	0.745				
Culture 6	0.789				
Effectiveness 1		0.710			
Effectiveness 2		0.748			
Effectiveness 3		0.731			
Effectiveness 4		0.766			
Effectiveness 5		0.830			
Lect. Background 1			0.885		
Lect. Background 2			0.915		
Lect. Background 3			0.779		
Lect. Background 4			0.820		
Lect. Background 6			0.754		
Reward 1				0.740	
Reward 2				0.827	
Reward 3				0.837	
Reward 4				0.862	
Reward 5				0.815	
Vision & Mission 3					0.829
Vision & Mission 4					0.785
Vision & Mission 6					0.852
Vision & Mission 7					0.765

Table 3 shows result of discriminant validity of the study. The result shows that there was few indicators that not great than 0.70 such as, lecture background 5 and 7, vision and mission 1, 2, 5. That indicators were eliminate because do not correlated with the construct variable while others indicator exceed .70 and proceed to the hypothesis testing. Furthermore, discriminant validity indicates that construct variable should be reflective and representative of the overall underlying construct and it should be different from others indicators. In addition, all variables exceed 0.70. they are representative of the underlying construct variable and also different from others indicators.

Table 4 Reliability and Validity

Variable	Cronbach's Alpha	rho_A	Composite reliability	AVE
Culture	0.868	0.885	0.900	0.601
Effectiveness	0.816	0.824	0.871	0.575
Lecture background	0.888	0.888	0.918	0.694
Reward & System	0.877	0.889	0.909	0.668
Vision & Mission	0.827	0.827	0.883	0.654

Table 4 shows that Cronbach Alpha and Composite Reliability scores that measure the reliability of the variables find a good results. It shows cronbach's alpha of construct variable is greater than 0.6 as well as composite reliability.Meanwhile, the average variance extracted (AVE) should be exceed than 0.5 and the results shows that none construct variable below 0.5. Overall, the measurement model of all variables has good reliability.

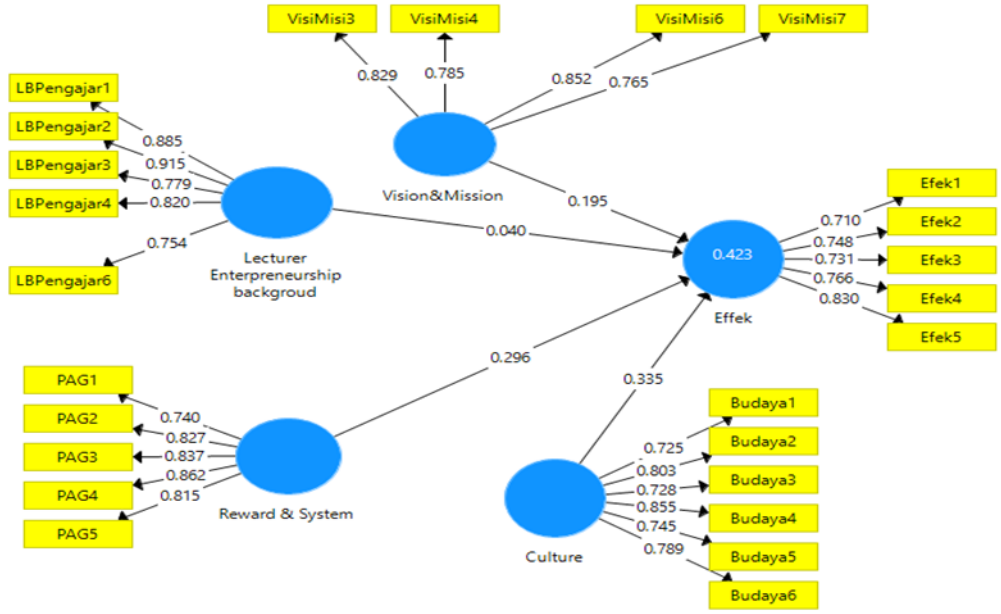
4.2.2. Inner model analysis

Inner model analysis is performed to ensure that structural models are built robust and accurate. Inner model evaluation can be seen from two indicators i.e., determination coefficient (R2) and predictive relevance (Q2). Furthermore, goodness of fit also include in the inner model analysis.

Table 5 – Inner model

Variable	R. Square	R. Square adjusted
Effectiveness Implementation Entrepreneurship study	0.423	0.388

R square explains how much exogenous variables hypothesized in equations are able to explain endogenous variables. The results shows that the model formed has R square value 0.423 (42.3%). It means the ability of independent variable to explain dependent variable effectiveness of entrepreneurship study is about 42.3% and the rest 57.7% explained by other independent variables that are not formulated in the research.



The figure 2 explains the relationship four independent variables to one dependent variable. The relationship of variable vision and mission to effectiveness have path coefficient value 0.195 and the variable of lecture background to effectiveness have path coefficient value 0.040. this can be interpreted that variable vision and mission and lecture background play little effect to increase effectiveness entrepreneurship education in the university. Meanwhile, variable reward to effectiveness with path coefficient 0.296 and variable culture to effectiveness with path coefficient 0.335 play role to improve effectiveness of entrepreneurship education in the university. Because only one dependent determined, therefore, Q-Square predictive relevance not necessary to be examined.

Goodness of fit (GoF) analysis

Goodness of fit or (GoF) is a single measure used to validate the combined performance between measurement models and structural models. GoF values range from 0-1 with interpretation 0.1 (small GoF); 0.25 (moderate GoF); and 0.36 (GoF substantial) (Garson, 2016). Unlike full of equation modeling, goodness of fit in the SEM-PLS should calculate manually with the formula:

$$GoF = \sqrt{\overline{AVE} \; x \; \overline{R^2}}$$

Based on the calculation manually, the GoF obtains 0.337. it shows that the research model indicates as moderate of Gof which about 0.25

4.2.3. Hypothesis Testing

Hypothesis testing is examined by looking at the value of probability with p-value . <0.05. SEM-PLS uses two analysis to test the hypothesis i.e., direct effect and indirect effect.

Direct Effect

Table 6 – Direct effect

	Original sample	Sample Mean	Standard deviation	T-Statistic	P-Value
Culture → Effectiveness	0.335	0.362	0.112	2.989	0.003
Lecture Background → Effectiveness	0.040	0.049	0.126	0.315	0.753
Reward system → Effectiveness	0.296	0.294	0.129	2.290	0.022
Vision & Mission → Effectiveness	0.195	0.184	0.146	1.340	0.181

Table 6 shows that variable culture to Effectiveness has p-value < 0.05 (0.003) and also variable reward system to effectiveness has p-value 0.05 (0.022). it means that two variables i.e., Culture and Reward system have significant effect to the effectiveness implementation entrepreneurship education in the university. On the other hand, variable lecture background to effectiveness has p-value >0.05 (0.753) as well as variable vision and mission to effectiveness has p-value >0.05 (0.181). it means both variables i.e., Lecture background and experience and vision and mission the university does not effect to the effectiveness implementation entrepreneurship education in the university

Indirect Effect

Table 7 – Indirect effect

	Original sample	Sample Mean	Standard deviation	T-Statistic	P-Value
Culture → Effectiveness	-	-	-	--	-
Lecture Background → Effectiveness	-	-	-	-	-
Reward system → Effectiveness	-	-	-	-	-
Vision & Mission → Effectiveness	-	-	-	-	-

Table 7 shows indirect effect of the variable. Although the variable culture and reward system have significant effect to the effectiveness implementation of the entrepreneurship education, it shows no result provided. It is also applied for the variable culture and variable vision and mission that do not have significant effect to the effectiveness implementation of the entrepreneurship education which no result provided. It indicates that there is another variable should be determined to find indirect effect result.

Summary of Hypothesis Testing

Hypothesis	Assumption	Results
H1. There is relationship between culture with effectiveness implementation entrepreneurship education in the university	+	Supported
H2. There is relationship between lecture background with effectiveness implementation entrepreneurship education in the university	+	Rejected
H3. There is relationship between reward system with effectiveness implementation entrepreneurship education in the university	+	Supported
H4. There is relationship between vision and mission university with effectiveness implementation entrepreneurship education in the university	+	Rejected

V. CONCLUSION

Based on the previous studies there are four aspects influencing the entrepreneurship collaborative learning effectiveness. The four aspect are culture, lecturer background, reward system and vision and mission. Those four aspects describe the emergent role of effective entrepreneurship learning model in the university. In order to find the

most influencing factors that improve the performance of entrepreneurship learning in higher education, the study conducts quantitatively. The quantitative approaches will determine the influencing factors of each enablers to improve performance of entrepreneurship learning in higher education. Through the SEM-PLS model investigation, it is obviously stated that the two aspects has strong relationships with the entrepreneurship collaborative learning effectiveness such as, culture and reward system. It indicates that culture is being developed by higher institution motivate the students to continue the entrepreneurship project until they graduate from the university. Therefore, it influence other students to follow their senior path be success entrepreneur. Meanwhile, reward system that provided by higher education institution motivates the students to improve their performance, produce branded of the product and lead to success of entrepreneur. On the other hand, lecturer or coaching background does not play role to encourage the student be entrepreneur, even though, they have many experiences to educate the student be entrepreneur. Many millennial students do not look their lecturer as their role to be success entrepreneur, instead they believe success in the entrepreneur its depends on their own capabilities. Vision and mission the higher education institution does not also influence the student be entrepreneur. This is because many universities put entrepreneurship as small portion of the university's objective and lack to focus on the entrepreneurship. This finding is necessary required for further strategic development on how higher education institution are going to develop entrepreneurship collaborative learning to achieve its effectiveness.the study conducted in the higher institution in South of Tangerang, Indonesia, in addition, it cannot be generalized to other higher education institution in another state since each higher education institution have their own character.

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