REVISTA ESPACIOS

Empirical study of the partnership model of vocational schools with business and industrial world in improving students' competency

Estudio empírico del modelo de asociación de escuelas vocacionales con el mundo empresarial e industrial para mejorar la competencia de los estudiantes

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ABSTRACT:

The purpose of this study is to describe the partnership model, the results of the empirical study, and the implications of organizing a partnership between SMK and DUDI (Business and Industrial World). The samples were 192 teachers chosen by employing proportionate stratified sampling technique. This study was an explanatory research. Data were analyzed using Structural Equation Modeling (SEM) analysis with Confirmatory Analysis Factor (CFA) test using Second Order Confirmatory in a form of multidimensional construction. The conclusion is the partnership model at Vocational High Schools is already fit and feasible.
Keywords: Partnership model, competency, business and industrial world, Vocational High Schools

RESUMEN:

El propósito de este estudio es describir el modelo de asociación, los resultados del estudio empírico y las implicaciones de organizar una asociación entre SMK y DUDI (Business and Industrial World). Las muestras fueron 192 maestros elegidos mediante el empleo de técnicas de muestreo estratificado proporcional. Este estudio fue una investigación explicativa. Los datos se analizaron mediante el análisis de modelado de ecuaciones estructurales (SEM) con la prueba del factor de análisis confirmatorio (CFA) utilizando el confirmatorio de segundo orden en una forma de construcción multidimensional. La conclusión es que el modelo de asociación en las escuelas secundarias vocacionales ya está en forma y factible.
Palabras clave: Modelo de asociación, competencia, mundo empresarial e industrial, escuelas secundarias vocacionales

1. Introduction

The current era of the Asean Economic Community requires a competitive and skilled workforce, one of which is born from a good quality vocational education and training that is relevant to the demands of the ever-expanding business and industrial world. Vocational High School, as one of the educational institutions, aims to prepare professional, qualified workforce capable of filling

employment and is expected to play a role as a superior tool for the business and the industrial world in Indonesia (Newhouse & Suryadarma, 2009; Felestin & Triyono, 2015).

Partnership between business and industry with vocational high schools is regulated by the government's policy. Focusing on revitalization of Vocational High Schools mandated in Presidential Instruction No. 9 of 2016, four points emerged. These four points covered curriculum revitalization, educators and education personnel, partnerships, and graduates. The Ministry of Education and Culture continues to encourage cooperation between the business and the industrial world with Vocational High School. Stated in the Strategic Plan of the Directorate of Vocational High School Development 2015-2019 (Ministry of Education and Culture, 2015) states that the disharmony between the world of work and the quality of Vocational High School graduates is one of the factors that encourage the low absorption of Vocational High School graduates in the world of work. One of the strategies for implementing Vocational High School revitalization is the concept of link and match between education and business and industry, with the industry being ideal to form a reciprocal relationship, there will be a link between labor suppliers with its users. Based on the principles and assumptions of the vocational education which is also supported by government policies on the revitalization of vocational education, it is necessary to study empirically about the partnership program of Vocational High Schools with the Business and Industrial World (Davis, 2004; Eichhorst et al., 2012; Retnawati et al., 2016).

Based on the observations at a number of vocational high schools in Makassar regarding the partnership model, it can be concluded that through the revitalization policy of Vocational High Schools, the government has sought to increase school partnerships with business and industry by involving all components related to the learning process by internship, building relations with outside school institutions, channeling, and placing labor according to their fields. But in a real situation, the partnership model implemented between the Vocational High School with the Business and Industrial World is not optimized according to the targeted indicators. Therefore, empirical studies are needed. The purpose of this study was to determine the description of the partnership model between Vocational Schools and DUDI in Vocational Schools, describe the results of the study empirically on the partnership model of Vocational Schools and DUDI, and describe the implications of organizing partnerships between Vocational Schools and DUDI on improving students' competency. Based on the research title, a hypothesis can be formulated that is there is a positive and significant influence of vocational partnership on student competence.

2. Methodology

The study used explanatory research. Data collection techniques in this study were observation, interviews and questionnaires. This research was conducted in Makassar with targets including several vocational schools in the city. Site selection consideration is based on attractiveness, uniqueness, and compatibility with the phenomena in achieving the research objectives. The chosen research locations are SMKN 5 Makassar, SMKN 10 Makassar, SMKS Darussalam Makassar and SMKS Telkom Makassar.

The populations in this study were 94 teachers of SMKN 5 Makassar, 86 teachers of SMKN 10 Makassar, 52 teachers of SMKS Darussalam Makassar and 36 teachers of SMK Telkom Makassar. The total population of this study was 268 people.

This study used proportionate stratified random sampling technique. The sample in this study was part of the 192 teachers from the total population. The number of samples taken in accordance with the sampling techniques listed in the table with an error rate of 1 % was developed by Isaac and Michael.

Data analysis aims to narrow and limit findings to become data that is orderly and organized. Data analysis techniques in this study used Structural Equation Modeling (SEM) analysis with The Second Order Confirmatory Factor Analysis. The data obtained is quantitative data. Quantitative data will be analyzed using SEM analysis with the help of the Analysis of Moment Structure (AMOS) program with the CFA test to test the dimensionality of a construct or research variable. The type of CFA used is Second Order Confirmatory Analysis with a multidimensional construct. The data analysis used Univariate analysis, Bivariate Analysis, and Multivariate analysis.

3. Results

3.1. Overview of the Partnership Model between Vocational High Schools with the Business World and the Industrial World

The primary data of the partnership variable aims to find out the picture of the partnership model between Vocational High Schools and Business and Industrial World analyzed using univariate analysis. Univariate analysis aims to analyze each of the variables examined in this study which will be broken down into a general description in this study. The descriptive univariate analysis of the partnership variable will be presented in respondents distribution table based on the partnership category that departs from the average value. If the average value of the respondent is below the average value, it is included in the unfavorable category, whereas above the average value is included in the good category.

Table 1
Distribution of Respondents
by Partnership Category

Partnership	Total	
	N	**%**
Not good	89	46.4
Well	103	53.6
Total	**192**	**100.0**

Source: Primary Data, 2019.

Table 1. shows that more respondents rated the vocational high school partnership as good as many as 103 (53.6%) while 89 (46.4%) rated it as not good. Based on the univariate analysis in table 1, the results of this study showed that most respondents rated the Vocational High School partnership as good at 53.6%, but there were also respondents who rated the vocational partnership as less at 46.4%. This means that partnership was a program that is good and proper to use. The results of this study are in line with the results of Sabri's (2017) research which states that the Vocational High School partnership model through internship teachers in the Business and Industrial World is effective and feasible to use.

Arifin's research results (2012) states that one of the efforts to raise awareness of the alignment of Vocational High Schools with the industrial world needs to be developed by both educational institutions and the business and community sectors, is to develop a network of mutually beneficial cooperation, especially in achieving common goals. The goal to be achieved is an empirical picture of the partnership or cooperation between Vocational High Schools and the industrial world in strategic planning, implementation, effectiveness, and school development by considering the results and benefits of partnership or cooperation.

3.2. Empirical Study Results Model of Vocational High School Partnership Models

Based on the results of the univariate analysis of partnership variables which show that the partnership model in Vocational High Schools is good and feasible to use, it can be concluded that the process of implementing Vocational High School partnerships with the Business and Industrial World has been well implemented. The results of the interview in this study stated that the partnership process of the Vocational High School with the Business and Industrial World has been carried out in accordance with procedures with various forms of activities. The form of partnership activities of Vocational High Schools with the Business and Industrial World are equipment donations, teacher training, student training, recruitment and skills competency tests.

This is in line with the results of Samsudi's research (2016) that shows that aspects of the needs of Vocational High School partnerships with stakeholders in the development of entrepreneurship graduates are directly related to the development of aspects: (a) Curriculum and learning materials; (b) Learning methods and strategies; (c) Utilization of HR (teachers and instructors); (d) Utilization of learning facilities and infrastructure; (e) Implementation of learning evaluations; and (f) Distribution of graduates to develop graduate entrepreneurship.

3.3. Implications of Organizing Partnerships between Vocational High Schools with the Business and Industrial World on Improving Student Competence

The implications of organizing partnerships between Vocational High Schools with the Business World and the Industrial World on improving student competency can be obtained by analyzing primary data on partnership variables and competency variables. This study tries to see the effect of the partnership variable and the competency variable. The analysis used is univariate analysis, bivariate analysis and multivariate analysis.

Table 2
Distribution of Respondents
by Competency Category

Competence	Total
	%
Not good	49.0
Well	51.0
Total	100.0

Source: Primary Data, 2019

The variables that will be described in the competency variables include; students' knowledge, skills and attitudes. Table 2 is the distribution table of respondents based on competency categories that depart from the average value (mean). If the average value of the respondent is below the average value, it is included in the unfavorable category and vice versa. Table 2 shows that more respondents rated the competency of vocational high school students as good as many as 98 (51.0%) and those who categorized it as not good is 94 (49.0%).

Bivariate analysis in this study was used to see the relationship between partnership variables and competency variables. The bivariate analysis used in this study refers to the cross tabulation table and Chi-Square Tests. The cross tabulation tables of partnerships and competencies are made based on the analysis of crosstabs data obtained using the AMOS program while the Chi-Square Tests table is obtained using the SPSS program.

Table 3
Cross Tabulation of Partnership
and Competency Variables

Partnership	Competence				P Value
	Not good		Good		
	N	%	N	%	
Not good	72	80,9	17	19,1	0.000
Good	22	21,4	81	78,6	
Total	94	49,0	98	51,0	

Source: Primary Data, 2019.

Table 3 shows that as many as 81 (78.6%) who rated the partnership and competency were in the good category and there were 72 (80.9%) who rated the partnership and competency as in the poor category. Statistical test results using the chi-square test obtained p value = 0,000 (p <0.05) which means the hypothesis is accepted so that it can be concluded that there is an influence and a relationship between Vocational High School partnerships with student competencies, which means that partnerships have an effect on increasing student competency.

Multivariate analysis used was a Confirmatory Analysis Factor (CFA) analysis to test the dimensionality of a construct or research variable. The type of CFA used is Second Order Confirmatory Analysis with a multidimensional construct.

The first step that must be done is to assess the structural model whether just identified, over identified or under identified by calculating the amount of covariance data and variance compared to the number of parameters estimated. The results of the model identification in this study were obtained with the help of the AMOS program:

Table 4
Computation of degrees
of freedom (Default model)

Number of distinct sample moments:	152
Number of distinct parameters to be estimated:	49
Degrees of freedom (152 - 49):	103
Result (Default model) *Minimum was achieved* *Chi-square = 340.041* *Degrees of freedom = 103* *Probability level = .000*	

The number of samples is 192, the number of covariance data and variants obtained is 152 and the number of parameters to be estimated is 49, then the degree of freedom value is 152-49 = 103 so it can be concluded that this model is over identified with a positive df value.

CFA analysis is necessary before going through the construct and suitability test in order to identify the model beforehand and it is hoped that the test results have a unique or identified value.

The output results above showed a very unique value (over identified) which is stated "minimum was achieved" with Chi-square 340,041 and degrees of freedom 103 and probability level 0,000. Multivariate variable normality test results using SPSS indicated that the data are normally distributed with the Kolmogrov Smirnov value of 1,394 (p> 0.05) so that it can be concluded that the data can be used for further analysis tests. Measurement model test results obtained Chi-square results in the initial model are very high reaching 2693,673 and the probability level of 0,000. The measurement test results using the AMOS program can be seen in the following image:

Figure 1
Initial Model

chi-square=2693.673
Probability =.000
TLI=.167
CFI=.284
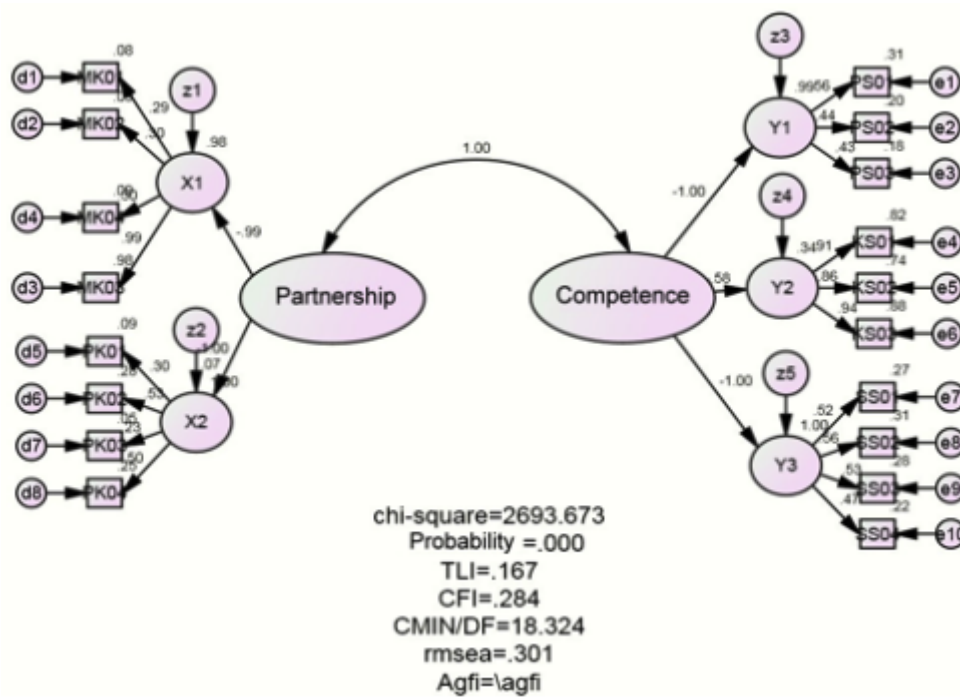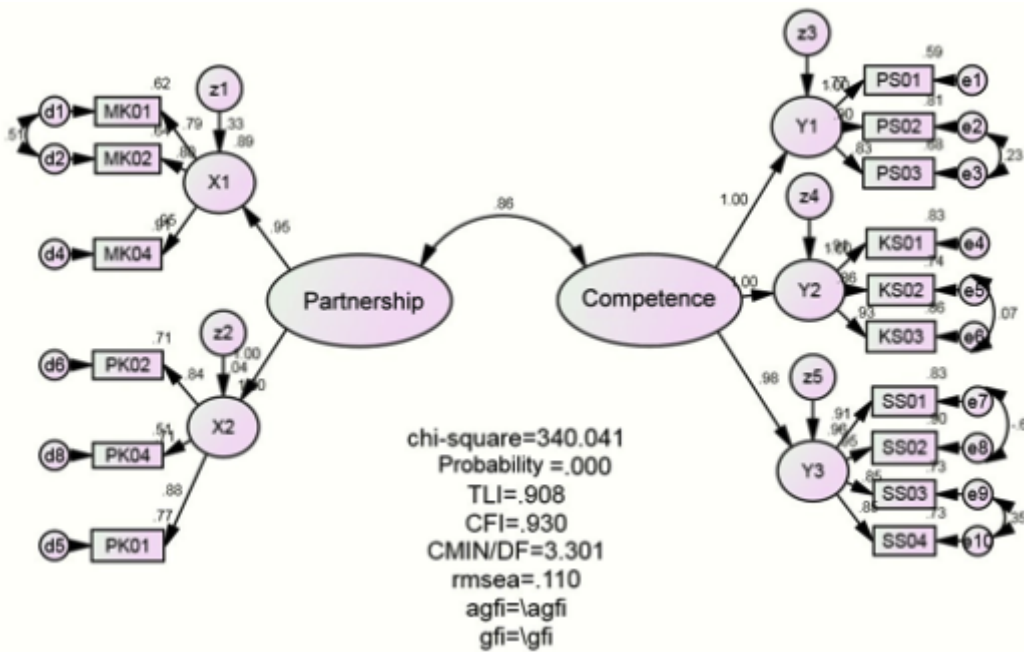CMIN/DF=18.324
rmsea=.301
Agfi=\agfi

Figure 1 show that it still has a negative variant value, so it must be given a small positive value and make some re-modifications so that the following model is found:
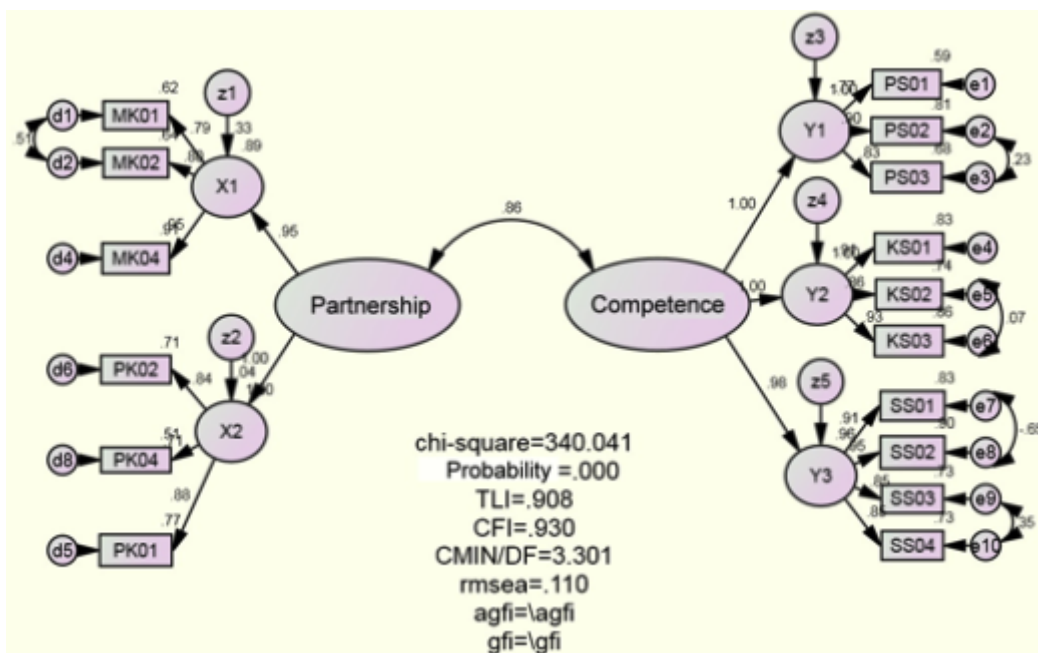
Figure 2
Final Model

chi-square=340.041
Probability =.000
TLI=.908
CFI=.930
CMIN/DF=3.301
rmsea=.110
agfi=\agfi
gfi=\gfi

The test of the model hypothesis shows that this model fits the data or is fit to the data used in this study. Although the Chi-Square value is quite large at 340,041, the Chi-Square value is affected by the degree of freedom. This study has a value of degree of freedom is 103. If the value of degree of freedom is smaller, the value of Chi-Square will decrease.

In Figure 2 the final model shows the results of elimination from the construct variables MK03 and PK03 because they have a loading factor value <0.5 which means the two variables are not suitable to be included as indicator variables in this study, the final model in the figure is found.

Figure 3
Structural Model

The structural model above shows a chi-square of 340,041 and a degree of freedom of 103. In figure 3 it can be seen that the TLI (≥ 0.9) and CFI (≥ 0.9) values are in accordance with the criteria. Even though the RMSEA, and CMIN / DF values are at marginal values, according to Hair et al. (1998) the value of the GOF criteria is close to the recommended value, the model is still feasible to proceed. This means that the model is quite fit and suitable for use.

Testing using the CFA model is done in stages. If the right model is not yet obtained, then the model proposed originally needs to be revised. The need for revision of the CFA model arises from the problems that arise from the analysis. The problem that may arise is the problem of the inability of the model developed to produce unique estimates. If these problems arise in the CFA analysis, it indicates that the research does not support the structural model that is formed. Models need to be revised by developing existing theories to form new models. The value of goodness of fit from this study will be displayed in table 4 obtained with the help of the AMOS program.

Table 5
Goodness of fit Test Results

Index	Fit criteria	Results	Information
RMSEA	≤ 0.08	0.110	*Marginal Fit*
CMIN/DF	≤2	3.301	*Not Fit*
CFI	≥ 0.90	0.930	*Good Fit*
TLI	≥ 0.90	0.908	*Good Fit*

GOF test results show that the model used is acceptable. CFI values of 0.930 and TLI of 0.908 were accepted with fit criteria 90 0.90. Chi-Square value in this study was 340,041. Sobron in Haryono and Parwoto (2012) said that Chi-Square cannot be used as the sole measure of overall model fit; one of the reasons is because chi-square is sensitive to sample size. When the sample size increases, the chi-square value will also increase and lead to the rejection of the model even though the value of the difference between the sample covariance matrix and the model covariance matrix has been minimized or small. Chi square is also closely related to the value of degree of freedom, if the degree of freedom is greater than it will affect the value of chi square.

The relationship between constructs in the hypothesis is shown by the regression weights value which aims to analyze that the indicator variable is a significant variable to the latent variable. The results show that the model in this study has a value of "good fit" which means that the exogenous construct model can be used in SEM analysis at the full model stage (full SEM model) and then the partnership variable and the competency variable being on the fit and feasible

criteria. The influence between variables found that the partnership variable and the competency variable give direct influence.

The results of this study indicate that the partnership and competency variables can influence each other in accordance with the results of the Goodness-of-fit-Model test in table 4 showing a CFI value of 0.930 and TLI of 0.908 accepted with the fit criteria ≥ 0.90. In the bivariate analysis tabulation of partnership and competency variables using the chi-square statistical test in table 4.5 obtained p = 0,000 (p <0.05) which means the hypothesis is accepted, so it can be concluded that there is an influence and a relationship between Vocational High School partnerships with student competencies which means that partnerships have an effect on increasing student competency.

The results of the study indicate that the three latent variables both knowledge, attitudes and skills deserve to be the latent variable of the variable "Competency" seen with good fit values. In line with the results of research by Okoye & Chijioke (2013) that training in vocational education organized by the industry and the private sector helps the industrial sector obtain a skilled, knowledgeable and professional career workforce.

The results of the interview showed that the goal of the SMK partnership is to ensure graduates have competencies in accordance with the competencies required by DUDI. This is consistent with the results of Wicaksono's research (2017) that the curriculum required for schools to collaborate with industry by forming industrial classes in an effort to improve the quality of vocational education. Implementation of the industrial class curriculum in vocational high schools can improve knowledge, skills and work attitudes that are very good for dealing with the world of work.

4. Conclusions

The description of the existing partnership model in the Vocational School is good and feasible to use, so it can be concluded that the partnership model between the Vocational High School with the Business and the Industrial World is good and feasible to use. The process of implementing the partnership between the Vocational High School with the Business and the Industrial World has been carried out well and has proceeded according to the procedure. Partnerships and competencies can influence each other, meaning that the partnership between Vocational High Schools and the Business and Industrial World can influence the improvement of student competencies

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