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Factors Affecting Work Readiness of Grade XII Students Program Modelling and Information Design Skills Building (DPIB) SMK Negeri 5 Bandung

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***Abstract*—This study aims to determine dominant factors affecting work readiness of students at Vocational Senior high Schools (SMK). Program Modelling and Information Design Skills Building (DPIB) 5 in Bandung and 109 students of class XII DPIB was selected as case study school and sample, respectively. This study used the ex-post facto research method with a quantitative approach. Data collection was carried out by using online questionnaire survey. Structural Equation Modelling (SEM) with the AMOS 23 test was utilized to analyse the data. The results showed that the factors of "attitude" (0, 379), and "industrial work experience" (0, 203) significantly influence work readiness. While the factors of "knowledge", "skills factors", "work motivation", and "economic conditions of family" do not significantly influence students' work readiness. The most dominant factor influencing student work readiness is factor of "attitude".**

Keywords—work readiness factors, student work readiness, Structural Equation Modeling (SEM)

I. INTRODUCTION

Growth in the era of the fourth industrial revolution and globalization demanded the needs of a knowledgeable and skilled mid-level workforce. That is, the current competition demands quality human resources to be ready to become a professional workforce in their field, one of the steps to prepare quality human resources in education. Education plays an important role in improving the quality of resources.

The school is a formal educational institution that grows and develops in the community. Informal education, there is a level of education, ranging from primary, secondary, to higher education. Based on UU 15 of Law No.20/2003 on the National Education System, vocational education is a secondary education that prepares students specially to work in certain fields [1]. Vocational High School (SMK) is a form of vocational education.

According to Depdiknas [2], Education in vocational schools aims to prepare students to be productive human beings, able to work independently, fill existing jobs in the business world, and industrial world as a mid-level workforce by competencies in their chosen skills program. The existence of the vocational school is required to meet the needs of resources, namely the needs of the workforce in the industrial world. So, students are required to have professional skills and attitudes in working according to their field.

In the current reality, vocational school as a unit of vocational secondary education implementation under the Directorate of Vocational School Construction has not been able to meet the demands of employment by its field. This is evidenced by data released by the Central Bureau of Statistics (BPS), Indonesia's Open Unemployment Rate (TPT) in August 2019 based on its education level, namely elementary, junior high school, high school, vocational school, diploma, and university, the TPT figure for elementary school graduates is the lowest at 2.41%, while the TPT figure for the vocational school level is the highest among other education levels which are reaching 10.42% [3].

This shows that many vocational school graduates are not channelled into the industrial world. Also, based on the assessment report given by the industry as a place of implementation of industrial work practices for vocational school students mentioned that many students do not have the maximum value on some aspects that can support their work readiness, especially the value on the soft skills aspect, so vocational school is considered not to be able to meet the needs of the workforce in the industrial world. Due to the student's lack of job readiness, the company or industry reconsiders hiring high school graduates.

According to Fitriyanto [4], work readiness can simply be interpreted as a condition that shows the harmony between physical, mental, and experience maturity so that the individual has the ability to carry out a particular activity concerning work or activity. Many factors that can affect the work readiness of vocational school students, then there needs to be an analysis of the problem so that there will be some factors that really affect the work for the students at the vocational school graduates. Based on the background above this research is necessary to be able to know what factors affect the work readiness of vocational

school students. So, the authors will research factors that affect the work readiness of Grade XII Students of the Modelling Design and Building Information (DPIB) Skills Program of SMK Negeri 5 Bandung.

This study aims to find out the factors that affect students' work readiness and to find out the factors that affect the most dominant work readiness in grade XII students of SMK Negeri 5 Bandung Modelling and Building Information Design (DPIB) skills program.

II. RESEARCH METHODS

This study uses a quantitative approach, and the research method used in this study is an ex-post-facto correlation. The number of samples in this study was taken from all students of Grade XII SMK Negeri 5 Bandung, which is 168 students and the sampling technique used in this study is the probability sampling technique.

In this study, the research variables were called latent or unobserved variables that could not be measured directly but formed through observed dimensions or indicators observed on a Likert scale in the form of questionnaires. There are two variables in latent variables, namely: independent variables (exogenous variables) and dependent variables (endogenous variables). The operational definitions of variables in this study are as follows:

- Knowledge (X_1)
  - Knowledge of work,
  - Knowledge of the basic subjects of the skills program
  - Knowledge of productive subjects
- Skills (X_2)
  - Basic skill
  - Technical skill
  - Interpersonal skill
  - Problem solving
- Attitude (X_3)
  - Religious attitudes
  - Honest
  - Discipline
  - Responsibility
  - Tolerance
  - Mutual Cooperation
  - Polite
  - Confident
- Industrial Work Experience (X_4)
  - Training of skills according to the field
  - Gain practical experience
  - Able to solve various problems in the field
  - Get closer to the industrial world
  - Increase confidence
- Work Motivation (X_5)
  - Desire to enter the industrial world
  - Hopes and ideas
  - Self-respect
  - Environmental urgency/encouragement
- Economic Conditions of Family (X_6)
  - Level of education
  - Income level
  - Job rate
- Student Work Readiness (Y)
  - Have logical and objective considerations
  - Have the ability and willingness to work with others
  - Able to control yourself or emotions
  - Have a critical attitude
  - Have the courage to accept responsibility individually
  - Adaptability to the environment and technological developments
  - Have ambitions to progress and try to keep up with the development of expertise

The data collection technique used in this study is to use a questionnaire technique. The data analysis used in this study is data analysis using SEM techniques that use AMOS tools. Structural equation model (SEM) or structural equation model is a combination of two separate statistical methods, namely factor analysis developed in psychology and psychometry and simultaneous equation modelling developed in econometrics [5]. The primary data obtained from the data collection is processed into an excel file first before further analysis. The tools used in this study to enter data in excel format are SPSS. Testing using AMOS proves that if the model is not fit with existing data, a model modification will be made.

III. RESULTS AND DISCUSSION

A. Model Identification

Identification of models needs to be done to determine whether further analysis can be done. As a basis in model identification, the degrees of freedom (df) value is used as a reference. SEM analysis can be performed if the df value is an over-identified model (Table 1). Conversely, if the df value is negative or 0 (just-identified model) the model estimate is not necessary [6].

TABLE I. MODEL IDENTIFICATION RESULTS

Variable	df	Description
Knowledge	0	just-identified model
Skills	2	over-identified model
Attitude	20	over-identified model
Industrial Work Experience	5	over-identified model
Work Motivation	2	over-identified model
Economic Conditions of Family	0	just-identified model
Student Work Readiness	14	over-identified model

B. Confirmatory Factor Analysis (CFA)

This analysis of Confucian factors is a stage of measurement of the dimensions that make up latent variables in the research model. There are two basic tests in the analysis of Confucian factors, namely model due diligence and loading factor significance test of each dimension.

A factor weighing test is used to find out if a variable can be used to confirm that it describes a latent variable. To know these indicators can form latent variables is to look at the standardized loading factor values of each indicator (Table 2 & Table 3). The required value is above 0.50. If a qualified value is obtained, then this indicates that the indicator is good enough to form a latent variable. Conversely, if the loading factor value is not eligible then the indicator is removed from the model.

TABLE II. CFA MODEL DUE DILIGENCE RESULTS

Skills (X_2)			
Goodness of Fit Index	***Cut-off Value***	***Analysis Results***	***Model Evaluation***
Chi-square	Expected to be small	8,794	Good fit
Probability	≥ 0,05	0,003	Good fit
RMSEA	≤ 0,08	0,269	Poor fit
GFI	≥ 0,90	0,962	Good fit
AGFI	≥ 0,90	0,624	Poor fit
CMIN/DF	≤ 2,00	8,794	Poor fit
TLI	≥ 0,90	0,653	Poor fit
CFI	≥ 0,90	0,942	Good fit
Attitude (X_3)			
Goodness of Fit Index	***Cut-off Value***	***Analysis Results***	***Model Evaluation***
Chi-square	Expected to be small	33,224	Good fit
Probability	≥ 0,05	0,023	Good fit
RMSEA	≤ 0,08	0,083	Marginal
GFI	≥ 0,90	0,933	Good fit
AGFI	≥ 0,90	0,872	Marginal
CMIN/DF	≤ 2,00	1,749	Good fit
TLI	≥ 0,90	0,888	Good fit
CFI	≥ 0,90	0,924	Good fit
Industrial Work Experience (X_4)			
Goodness of Fit Index	***Cut-off Value***	***Analysis Results***	***Model Evaluation***
Chi-square	Expected to be small	4,300	Good fit
Probability	≥ 0,05	0,367	Good fit
Goodness of Fit Index	***Cut-off Value***	***Analysis Results***	***Model Evaluation***
RMSEA	≤ 0,08	0,026	Good fit
GFI	≥ 0,90	0,984	Good fit
AGFI	≥ 0,90	0,941	Good fit
CMIN/DF	≤ 2,00	1,075	Good fit
TLI	≥ 0,90	0,977	Good fit
CFI	≥ 0,90	0,999	Good fit
Work Motivation (X_5)			
Goodness of Fit Index	***Cut-off Value***	***Analysis Results***	***Model Evaluation***
Chi-square	Expected to be small	1,589	Good fit
Probability	≥ 0,05	0,452	Good fit
RMSEA	≤ 0,08	0,000	Good fit
GFI	≥ 0,90	0,993	Good fit
AGFI	≥ 0,90	0,965	Good fit
CMIN/DF	≤ 2,00	0,795	Good fit
TLI	≥ 0,90	1,016	Good fit
CFI	≥ 0,90	1,000	Good fit
Student Work Readiness (Y)			
Goodness of Fit Index	***Cut-off Value***	***Analysis Results***	***Model Evaluation***
Chi-square	Expected to be small	21,876	Good fit
Probability	≥ 0,05	0,039	Good fit
RMSEA	≤ 0,08	0,087	Marginal
GFI	≥ 0,90	0,944	Good fit
AGFI	≥ 0,90	0,869	Marginal
CMIN/DF	≤ 2,00	1 ,823	Good fit
TLI	≥ 0,90	0,955	Good fit
CFI	≥ 0,90	0,974	Good fit

TABLE III. RESULTS OF STANDARDIZED REGRESSION WEIGHTS

Skills (X_2)		
Indicators	***Estimate***	***Description***
X2.IND1	,716	Accepted
X2.IND2	,908	Accepted
X2.IND3	,533	Accepted
X2.IND4	,301	Rejected
Attitude (X_3)		
Indicators	***Estimate***	***Description***
X3.IND8	,403	Rejected
X3.IND7	,711	Accepted
X3.IND6	,678	Accepted
X3.IND5	,700	Accepted
X3.IND4	,657	Accepted
X3.IND3	,210	Rejected
X3.IND2	,533	Accepted
X3.IND1	,371	Rejected
Industrial Work Experience (X_4)		
Indicators	***Estimate***	***Description***
X4.IND5	,838	Accepted
X4.IND4	,843	Accepted
X4.IND3	,657	Accepted
X4.IND2	,772	Accepted
X4.IND1	,816	Accepted
Work Motivation (X_5)		
Indicators	***Estimate***	***Description***
X5.IND4	,568	Accepted
X5.IND3	,441	Rejected
X5.IND2	,812	Accepted
X5.IND1	,649	Accepted
Student Work Readiness (Y)		
Indicators	***Estimate***	***Description***
Y.IND1	,740	Accepted
Y.IND2	,696	Accepted
Y.IND3	,785	Accepted
Y.IND4	,737	Accepted
Y.IND5	,669	Accepted
Y.IND6	,641	Accepted
Y.IND7	,834	Accepted

C. Assumption Test

1) Univariate and mutivariate outliers: Testing of the absence of univariate outliers is carried out by analyzing standardized values (Z-scores) from the research data used. If there is a Z score in the range ≤ -3 or ≥ 3, it will be categorized as an outlier.

The test results showed that none of the dimensions had an outlier, this was because previously z scores that had values ranging ≤ -3 or ≥ 3 were said to be outliers and issued, the data released from the analysis were data numbers 17, 43, 84, and 93. After that, the Z score testing is done again.

2) Data normality: Normality evaluation is carried out using critical ratio skewness value and kurtosis value criteria, where the value of both ratios that have a value greater than the absolute value of 2.58 means the data is distributed abnormally.

The analysis shows that there is no C.R. value for skewness that is outside the range of ±2.58. Thus, the data used has met the requirements of data normality, or it can be said that the research data has been distributed normally.

3) Multicholinearity: The evaluation of multicollinearity assumptions aims to test whether regression is found to be a correlation between independent variables. To know the absence of symptoms of multicollinearity can be seen from the amount of value tolerance and VIF (Variance Inflation Factor) through the SPSS program. The commonly used value is the Value Tolerance > 1 or if the value of < 5, then there is no multicollinearity in the data (Table 4).

TABLE IV. MULTICHOLINEARITY TEST RESULTS

Variable	Tolerance	VIF
Skills (X_2)	,511	1,958
Attitude (X_3)	,593	1,687
Industrial Work Experience (X_4)	,621	1,611
Work Motivation (X_5)	,709	1,410

D. Structural Equation Modeling (SEM)

Analysis of data processing results at the full stage of the SEM model is done by conducting model due diligence (Figure 1 & Figure 2). The overall model due diligence was conducted to see if the model used in the study met the goodness of fit using the AMOS 24 program.

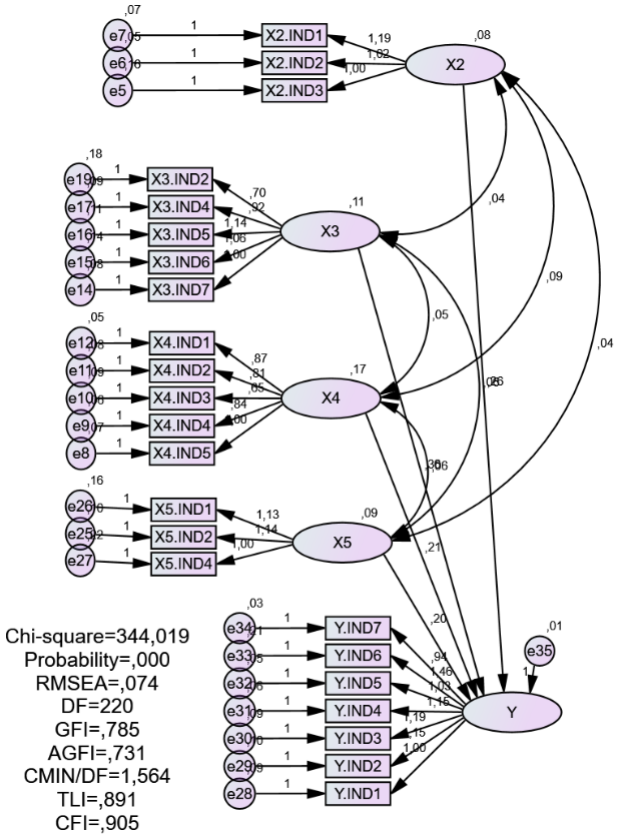

Fig. 1. First stage SEM model.

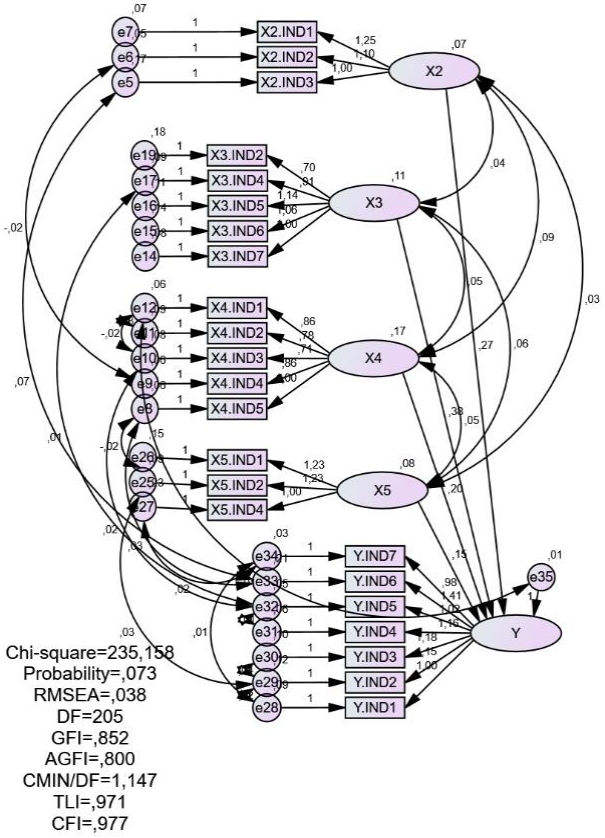

Fig. 2. Final stage SEM model (after modification).

TABLE V. MODEL DUE DILIGENCE RESULTS

Goodness of Fit Index	Cut-off Value	Analysis Results	Model Evaluation
Chi-square	Expected to be small	235,158	Good Fit
Probability	≥ 0,05	0,073	Good Fit
RMSEA	≤ 0,08	0,038	Good fit
GFI	≥ 0,90	0,852	Marginal
AGFI	≥ 0,90	0,800	Marginal
CMIN/DF	≤ 2,00	1,147	Good fit
TLI	≥ 0,90	0,971	Good fit
CFI	≥ 0,90	0,977	Good fit

Based on the results of the goodness of fit index (Table 5) already qualified specified. Model conformity indices such as RMSEA (0.038), GFI (0.852), AGFI (0.800), CMIN/DF (1.147), TLI (0.971), CFI (0.977) are sufficient to meet the model's suitability. Therefore, this model is feasible and acceptable.

Once all assumptions can be fulfilled, further hypothesis testing will be conducted. Hypothetical testing of this study was conducted based on the Critical Ratio (C.R.) value of a causality relationship of SEM processing results (Table 6).

TABLE VI. REGRESSION WEIGHTS STRUCTURAL EQUATION MODEL TEST RESULT

Variable	Estimate	C.R.	P	Conclusion
Skills (X_2)	,274	1,854	,064	Insignificant
Attitude (X_3)	,379	3,806	***	Significant
Industrial Work Experience (X_4)	,203	2,099	,036	Significant
Work Motivation (X_5)	,153	1,405	,160	Insignificant

Hypothetical test results show that:

- The skill factor directly affects student work readiness by 0.274. The value of C.R. is 1,854 and with a probability of 0.064. Both values are not eligible for hypothetical acceptance, as the value of C.R. 1,854 is smaller than 1.96 and the probability of 0.064 is greater than 0.05. Based on these results it can be concluded that students' skills have no significant effect on the student's work readiness.
- The attitude factor directly affects student work readiness by 0.379. The C.R. value is 3,806 and with a probability of 0.000. Both values are already eligible for hypothetical acceptance, as the value of C.R. 3,806 is greater than 1.96 and a very significant probability. Based on these results it can be concluded that students' attitudes have a significant effect on students' work readiness.
- The industrial work experience factor (prakerin) directly affects student work readiness by 0.203. The value of C.R. is 2,099 and with a probability of 0.036. Both values are already eligible for hypothetical acceptance, as the value of C.R. 2,099 is greater than 1.96 and the probability of 0.036 is smaller than 0.05. Based on these results, it can be concluded that the influence of students' industrial work experience (prakerin) has a significant effect on students' work readiness.
- The work motivation factor directly affects the student's work readiness of 0.153. The value of C.R. is 1,405 and with a probability of 0.160. Both values are not eligible for hypothetical acceptance, as the value of C.R. 1,405 is smaller than 1.96 and the probability of 0.160 is greater than 0.05. Based on these results it can be concluded that the motivation of the student does not have a significant effect on the student's work readiness.

IV. CONCLUSION

Based on the results of research conducted on grade XII DPIB SMK Negeri 5 Bandung students, the following conclusions were obtained:

- Attitude factors and industry work practice experience factors (prakerin) have a significant influence on students' work readiness.
- Knowledge factors, skills, motivation, and economic circumstances of the family do not have a significant influence on student work readiness.
- The most dominant factor that affects students' work readiness is the attitude factor.

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