The Competence of Machining Engineering Skills of SMK Negeri 6 Batam and Its Relevance to the Implementation of PKL (Field Work Practices) on Readiness to Enter the Workforce

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Abstract. This research was conducted in order to find out how the process of implementing PKL (Field Work Practice) students at SMK Negeri 6 Batam and the effect on existing skills at school to be applied during the Implementation of PKL (Field Work Practices) in order to prepare themselves to enter the world of work. This study uses a quantitative approach to the correlation method. Collecting data by distributing questionnaires to students of SMK Negeri 6 Batam and the Industry Party with sampling technique using saturated sampling technique. The results of the distribution of questionnaires show that the implementation of PKL (Field Work Practice) students of SMK Negeri 6 Batam is carried out to hone students' competency skills. The results of the study prove that Machining Engineering Expertise Competence with the implementation of PKL (Field Work Practice) has a significant and significant influence on readiness to enter the world of work.

Keywords: Skill Competency, Relevance, Field Work Practice, Working World.

1 Introduction

Vocational High School (SMK) according to the Law of the Republic of Indonesia No. 20 of 2003 concerning the National Education System is "Vocational Education is one of the educations that prepares students to be able to work in certain sectors."

Government Regulation No. 19 of 2005 concerning National Education Standards, states about "Vocational Secondary Education is education at the secondary level that specializes in developing students' abilities in certain types of work."

SMK Negeri 6 Batam is an institution engaged in the technology-based vocational education sector which is tasked with preparing students to be able to work appropriately with their field of expertise. SMK Negeri 6 Batam was established based on the Decree of the Mayor of Batam Number: KPTS.367/HK/IX/2014 concerning the Establishment of New School Units and the Naming of State Schools for Elementary, Middle, High and Vocational High Schools in Batam City in 2010 in Batam City. 72 Educators and Education Personnel and 1,400 Students. SMK Negeri 6 Batam has 5 Skill Competencies, namely: Welding Engineering, Machining

Engineering, Heavy Equipment Engineering, Light Vehicle Engineering, and Computer and Network Engineering.

It is expected that the achievement of machining engineering expertise competence must be of Industry standard with a Significant Relevance Level. The greater the level of influence, the deeper or higher the achievement of Expert Competence in Industry through the Field Work Practice Program (PKL) and vice versa. According to research conducted by (W, W. C., Sutikno, T.A., & Herwanto, H. W. 2019) there is an influence between the suitability of field work practices and competency skills with readiness for employment. **The purpose** of the investigation is to find out what are the effects of graduates of Mechanical Engineering Skills Competence with the implementation of Field Work Practices (PKL) and readiness to go to work.

2 Literature Review

2.1 Competence

Competence is the condition of the appearance of certain abilities which are a complete combination of knowledge and abilities that can be measured or observed. These competencies include cognitive, affective and psychomotor abilities. Meanwhile, according to Spencer (2014) in research conducted by Hidayat & Zainuddin (2017), states that competence can be interpreted as a special trait or characteristic that underlies a person related to individual performance efficiency or personal nature that has a causal influence with reference criteria, build or work excellently in the field or work site.

2.2 SMK (Vocational High School)

Government Regulation No.29 of 1990 concerning Secondary Education Chapter I Article 1 Paragraph 3, that Vocational Secondary Education is education at the secondary level that has qualifications for developing the ability of students to apply certain types of work assignments

2.3 Machining Engineering Skill Competence

In each vocational school there are many skill competency programs, the expertise competencies contained in SMK Negeri 6 Batam include: Light Vehicle Engineering, Heavy Equipment Engineering, Computer and Network Engineering, Machining Engineering, and Welding Engineering. But in this research only focused on Machining Engineering Skills Competence.

In the Machining Engineering Skills Competence, there are Hard Skill and Soft Skill competencies needed in the World of Work. Hard Skill Competencies are competencies that include foreign language skills, technical skills (Mechanical Engineering, Design, Architects, Manufacturing, Maintenance of a Mechanical system), General knowledge of mechanical engineering, motion engineering, machine modelling, basic thermodynamics, numerical methods and so on. Meanwhile, Soft Skill Competencies are competencies that include communication skills, critical thinking, leadership, good behaviour, work ethic, teamwork and collaboration.

2.4 Field Work Practice

Field Work Practice is a form of training program held outside of school/class, which is part of an integrated training program. Meanwhile, in the Regulation of the Minister of Industry of the Republic of Indonesia, 2017 Number 03/M-IND/PER/1/2017 concerning "Guidelines for Guidance and Development of Competency Vocational High Schools that Link and Match with Industry" it is explained that PKL (Field Work Practice) is a work practice in industry or industrial estate companies that are part of the vocational education curriculum in order to master knowledge or skills in the industrial world. Each education unit takes over the preparation of learning programs carried out in schools and in the world of work/DUDI in order to achieve an effective and efficient learning process. So Learning that is specifically programmed to be held in the world of work is called PKL (Field Work Practice).

2.5 Relevance

According to the Ministry of National Education in the Big Indonesian Dictionary (KBBI), Relevance means Relevant, which means to be relevant, is directly useful. Meanwhile, according to Sukmadinata (2007), Relevance is divided into Internal Relevance and External Relevance. Internal relevance is the suitability between elements such as objectives, content, learning and evaluation processes, or in other terms, internal relevance concerning the integration between existing elements. External relevance is the fit between demands, needs, and changes in society. Relevance contains two dimensions of life, namely the world of school/university and the world of work/society. Therefore, the relevance of an educational program contains elements: Objectives, Inputs, Processes, Outputs and Outcomes (Impacts), and the relationship and meaning between one element and other elements in a system..

2.6 Working World

The world of work is an opportunity for graduates to get a job after completing their studies at university. The world of work is shown through the type of work currently being undertaken by graduates, along with the income/salary obtained from their work. Human resources in Indonesia are divided into 2 groups, namely the non-labor force group and the labor force group. According to Barthos (2009), employment is an activity of a business/institution or company where an individual works. Then the world of work is things related to work. This investigation of the world of work is viewed from the type of graduate work and income/salary.

3 Methods

The approach used in the investigation is quantitative with a descriptive method. Data collection was obtained from the distribution of questionnaires for 105 students of Machining Engineering Skills Competence at SMK Negeri 6 Batam and several Industrial Parties, then the results were tabulated and will be processed and analyzed to obtain conclusions from each problem.

This study uses three variables, namely Expertise Competence, Implementation of PKL (Field Work Practices) and the World of Work. The research was conducted using the correlation analysis method to process the data from the questionnaires obtained from the respondents. The formula used in this investigation is the multiple Linear Regression Analysis formula as follows:

$$Y = +1X1 + 2X2 \qquad (1)$$

Information:

Y = World of Work

X1 = Skill Competence

X2 = Implementation of street vendors

A = Constant

β   = Regression Coefficient

4 Result and Discussion

Based on the results of distributing questionnaires What researchers do is that every student who carries out street vendors will get additional knowledge and skills apart from what they have started to learn and practice at school so that they can apply it again in the Industrial World when they work later. In the implementation of street vendors the role of a company supervisor is also very important, including guiding students during practice in industry, supervising and giving reprimands to students when the implementation of street vendors is in progress according to the SOPs that have been implemented in the company, providing advice and input to students on the tasks they do and provide an assessment of student performance in the field of work.

4.1 Descriptive Statistics

The respondents who were taken in this investigation were Class XII students from the Machining Engineering Skills Competence for the 2020/2021 academic year, where the number of respondents was 105 students. The investigation was carried out via Google Form. The profile of the respondents for this investigation includes the age of the students, gender and local class.

A.   Machining Engineering Skills Competencies needed in the World of Work

1   Hard Skill

Hard skill competencies in mechanical engineering work required by the world of work broadly include all competencies related to analysis and problem solving as well as the use of work technology. These competencies include foreign language skills, engineering skills (Mechanical Engineering, Design, Architect, Manufacturing, Maintenance of a Mechanical system), General knowledge of mechanical engineering, motion engineering, machine modelling, basic thermodynamics, numerical methods and so on.

There are 11 hard-skill questions in the Machining Engineering Expertise Competency which were researched and involved 13 Industry Parties. The value of 11 questions was analysed descriptively by using SPSS software which is described in table 1.

Table 1. Statistical Analysis of Hard-skill Competence.

Statistics		
Hard_Skill		
N	Valid	13
	Missing	0
Mean		47.77
Median		46.00
Statistics		
Mode		43[a]
Std. Deviation		5.085
Variance		25.859
Range		15
Minimum		40
Maximum		55
Sum		621

(Source: SPSS Processing Results, 2022)

2   Soft Skill

Soft skill competencies in Mechanical Engineering jobs needed by the world of work broadly include all competencies related to analysis and problem solving as well as the use of work technology. These competencies include communication skills, critical thinking, leadership, good behavior, work ethic, teamwork and collaboration.

There are 14 soft-skill questions in the Machining Engineering Expertise Competency which were researched and involved 13 Industry Parties. The value of 14 questions was analyzed descriptively by using SPSS software which is described in table 2.

Table 2. Statistical Analysis of Soft-skill Competence

Statistics		
Soft_Skill		
N	Valid	13
	Missing	0
Mean		55.54
Median		56.00
Mode		56
Std. Deviation		9.315
Variance		86.769
Range		31
Minimum		36
Maximum		67
Sum		722

(Source: SPSS Processing Results, 2022)

4.2 Inferential Statistics

Inferential statistics are carried out in order to analyze the sample data in statistical calculations so that conclusions can be drawn on the population from the sample. (Sugiyono, 2017).

A. Classic Assumption Test

Normality test is used to see if the data distribution is normally distributed or not. The normality test of this investigative data can be detected with the Kolmogrov-Smirnov Test on SPSS 22 with the decision criteria that if the probability value is > 0.5 then the data is normally distributed and if the probability is < 0.5 then the data is not normal. The output of the investigation data normality test can be seen in table 3.

Tabel 3. Normality Test Output

One-Sample Kolmogorov-Smirnov Test		Unstandardized Residual
N		105
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	1.59935416
Most Extreme Differences	Absolute	.075
	Positive	.039
	Negative	-.075
Test Statistic		.075
Asymp. Sig. (2-tailed)		.173[c]
a. Test distribution is Normal.		
b. Calculated from data.		
c. Lilliefors Significance Correction.		

(Source: SPSS Processing Results, 2022)

B. Multiple Correlation Analysis

Multiple Correlation Analysis is a way to find out whether or not there is a linear relationship between variables. Strength of the relationship between two variables is usually referred to as the Correlation Coefficient with the symbol "r". Table 6 shows the output of multiple correlation analysis calculations in this study:

Table 4. Multiple Correlation Analysis Results

Model Summary									
	R				Change Statistics				
Model		R Square	Adjusted R Square	Std. Error of the Estimate	R Square Change	F Change	df1	df2	Sig. F Change
1	.560ᵃ	.314	.300	1.615	.314	23.300	2	102	.000
a. Predictors: (Constant), Implementation of PKL, Skill Competency									

(Source: SPSS Processing Results, 2022)

4.3 Data Quality Test

A. Validity Test

To test the reliability of the questionnaire, the researcher conducted a validity test or to know the accuracy of the questionnaire measuring instrument designed by the researcher in collecting data. The questionnaire used as a measuring tool in the investigation is based on the r-table value, where valid items are obtained if the output correlation value (r-count) is greater than the statistical value of the r-table. In this study, the number of respondents tested was n=105, so the r-table with a probability of 0.05 was 0.1900. To help calculate validity more accurately, IBM SPSS 25 software is used, the output is produced in the table below:

Table 5. Validity Test Results.

Variable	Item	r-count	r-table 5% (N=105)	Description
Skill Competency (X1)	X1.1	0,4450	0,1900	Valid
	X1.2	0,5000	0,1900	Valid
	X1.3	0,5230	0,1900	Valid
	X1.4	0,4410	0,1900	Valid
	X1.5	0,4390	0,1900	Valid
	X1.6	0,4770	0,1900	Valid
	X1.7	0,5060	0,1900	Valid
	X1.8	0,5210	0,1900	Valid
	X1.9	0,4960	0,1900	Valid
Implementation of PKL (X2)	X2.1	0,4590	0,1900	Valid
	X2.2	0,4560	0,1900	Valid
	X2.3	0,3850	0,1900	Valid

Variable	Item	r-count	r-table 5% (N=105)	Description
	X2.4	0,3810	0,1900	Valid
	X2.5	0,2000	0,1900	Valid
	X2.6	0,3520	0,1900	Valid
	X2.7	0,2140	0,1900	Valid
	X2.8	0,2280	0,1900	Valid
	X2.9	0,4300	0,1900	Valid
Working World (Y)	Y.1	0,4320	0,1900	Valid
	Y.2	0,4370	0,1900	Valid
	Y.3	0,4960	0,1900	Valid
	Y.4	0,2690	0,1900	Valid
	Y.5	0,3070	0,1900	Valid
	Y.6	0,3850	0,1900	Valid
	Y.7	0,3380	0,1900	Valid
	Y.8	0,2330	0,1900	Valid

(Source: SPSS Processing Results, 2022)

B. Reliability Test

Reliability test is an indicator of the consistency of a variable. A questionnaire instrument is said to be reliable or reliable if each question item can be answered consistently (Ghozali, 2018). Reliability checks were carried out using the Cronbach Alpha formula (α). The criteria for a questionnaire question item are declared reliable if the alpha value is greater than 0.70. The output of the reliability test in this study can be seen in table 6:

Table 6. Reliability Test Results

No.	Variable	Cronbach's Alpha	Cut off Cronbach's Alpha	Description
1	X1	0,785	0,7	Reliable
2	X2	0,658	0,7	Reliable
3	Y	0,577	0,7	Reliable

(Source: SPSS Processing Results, 2022)

4.4 Influence Test

A. Linear Regression Analysis

Linear Regression Analysis is used to measure the effect of more than one predictor variable (independent variable) on the dependent variable. Based on the results of the Linear Regression Analysis Test on SPSS, it can be seen below.

1. Skill Competence with the World of Work

Based on the results of the partial test on SPSS, the partial correlation between Expertise Competence and the World of Work can be seen in table 7 below:

Table 7. Partial Test Results of Expertise Competence with the World of Work.

Coefficients^a		Unstandardized Coefficients		Standardized Coefficients		
Model		B	Std. Error	Beta	t	Sig.
1	(Constant)	23.284	2.502		9.305	.000
	Skill Competency	.302	.047	.532	6.400	.000
	Implementation of PKL	.064	.048	.112	1.344	.182
a. Dependent Variable: Working World						

(Source: SPSS Processing Results, 2022)

The results of this study obtained a value of 6.667 > 1.983 with a significance value of 0.000 < 0.05. Thus, it can be stated that the Expertise Competence variable (X1) partially has a significant effect on the absorption of the World of Work (Y). Therefore, it can be determined that H1 which states that "Skill Competence partially has a significant effect on the World of Work is **"accepted".**

2. Implementation of Field Work Practices with the World of Work

From the results of the partial test on SPSS, the partial correlation between the implementation of street vendors and the world of work can be seen in Table 8 below:

Table 8. Partial Test Results Implementation of Field Work Practices with the World of Work

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	33.772	2.228		15.160	.000
	Implementation of PKL	.112	.056	.195	2.016	.046
a. Dependent Variable: Working World						

(Source: SPSS Processing Results, 2022)

The results obtained are 2,016 > 1,983 with a significance value of 0.046 < 0.05, which means that it can be stated that the variable PKL implementation (X2) partially significantly influences the absorption of the world of work (Y). Therefore, it can be determined that H2 which states that the implementation of street vendors partially has a significant effect on the world of work is **"accepted".**

3. Multiple Linear Regression

Based on the test results on the SPSS Multiple Linear Regression correlation, it can be seen in table 9 below:

Tabel 9. Multiple Linear Regression Test Results Expertise Competence and Implementation of Field Work Practices with the World of Work

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	23.284	2.502		9.305	.000
	Skill Competency	.302	.047	.532	6.400	.000
	Implementation of PKL	.064	.048	.112	1.344	.182
a. Dependent Variable: Working World						

(Source: SPSS Processing Results, 2022)

From the table above, the following equation is obtained:

$$Y = 23{,}284 + 0{,}302X1 + 0{,}064X2 \tag{2}$$

With its interpretation, namely:

1. Based on the regression equation above, it can be seen that the constant value in the variable of Expertise Competence (X1) and PKL Implementation (X2) with the World of Work (Y) has a positive value of 23,284.

2. The coefficient value of the Skills Competence Variable (X1) is positive, namely 0.302, meaning that if the value of the World of Work Variable (Y) is increased by 1 unit, it will increase to 0.302.

3. The coefficient value of the PKL Implementation Variable (X2) has a positive value of 0.064, meaning that if the value of the World of Work Variable (Y) is increased by 1 unit, it will increase to 0.064.

4.5 Hypothesis Test

1. T Test (Partial)

T-test is used to identify each variable X to variable Y. The test is carried out by comparing the t-count numbers with the following t-table:

Table 10. T Test Results.

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	23.284	2.502		9.305	.000
	Skill Competency	.302	.047	.532	6.400	.000
	Implementation of PKL	.064	.048	.112	1.344	.182
a. Dependent Variable: Working World						

(Source: SPSS Processing Results, 2022)

Based on Table 12 above, it can be seen that to see the value of the t-table, we can use the formula for the value of df (degree of freedom), namely: 9 df = (n-k), then df = (105-3) = 102. With a significance level of a (alpha) of 5% so that the t table value is 1.983. So the partial influence in this study can be seen as follows:

a. Expertise Competence (X1)

From the results of the t test (partial) the t value is 6.400 > 1.983 with a significant value of 0.000 < 0.05. That way it can be stated that the Expertise Competence variable (X1) partially has a significant effect on the absorption of the World of Work (Y). Therefore, it can be determined that H1 which states that "Skill Competence partially has a significant effect on the World of Work" is accepted.

b. Implementation Field Work Practice (X2)

From the results of the t-test (partial) the t-count value is 1.344 < 1.983 with a significant value of 0.183 > 0.05. Thus, it can be stated that H2 in the PKL Implementation variable (X2) partially has no significant effect on the absorption of the World of Work (Y).

2. F Test (Simultaneous)

The F test is conducted to identify whether the variable X is simultaneously with the variable Y, by utilizing the significance probability numbers, namely:

a. When the probability is significant > 0.05, then Ha is rejected.
b. When the probability is significant < 0.05, then Ha is accepted.

Tabel 11. F Test Results.

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	121.537	2	60.768	23.300	.000^b
	Residual	266.025	102	2.608		
	Total	387.562	104			
a. Dependent Variable: Y						
b. Predictors: (Constant), X2, X1						

(Source: SPSS Processing Results, 2022)

Based on Table 13 above, the calculated F value is 23,300 with a significant value of 0.000. The value of F table is searched using the formula for the value of df (degree of freedom) with a significance level of a (alpha) of 5% as follows:

- df1 (number) = k-1 = 3-1 = 2

- df2 (denominator) = n-k = 105 – 3 = 102

So, the value of F Table is 3.09. From the calculation results, it is obtained that the F value count is 23.300 > 3.09 with a significant value of 0.000 < 0.05 which indicates that the regression model of the Expert Competence (X1) and PKL Implementation (X2) variable simultaneously has a positive and significant effect on the world of work (Y).

4.6 Discussion

1. Influence between Machining Engineering Skills Competence and the World of Work

The influence in this study shows that Machining Engineering Skills Competencies are needed in the world of work, these two things are interrelated, Expert Competence is chosen as a provision for students to achieve careers and their future. The world of work becomes a role as a forum that accepts talented people with expertise in certain fields. Based on the results of the partial test on SPSS between Expertise Competence (X1) and the World of Work (Y), the results obtained are T count 6.667 > T table 1.983 with a significance value of 0.000 <0.05. Thus H1 is accepted, meaning that there is a significant influence between Expert Competence and Job Absorption at a significance level of 5%. Based on the results of descriptive statistics

obtained from distributing questionnaires involving 13 industry parties, the results show that the Machining Engineering Skills Competence requires Hard Skills and Soft Skills Competencies in the World of Work.

The results of this study are also in line with research conducted by Rahmat Hidayat and Muhammad Zainuddin (2017) which states that competence is a determining factor in entering the world of work. Competence shows professionalism that can have a good influence on the development of an institution / organization. With competence, of course it will be easier to place someone in accordance with their job duties.

2. The Influence of the Implementation of PKL (Field Work Practices) with the Absorption of the World of Work

Based on the results of the partial test on SPSS between the implementation of street vendors (X2) and the world of work (Y), the results obtained are T count 2,016 > T table 1,983 with a significance value of 0.046 < 0.05. Thus H2 is accepted, meaning that there is a significant influence between the implementation of street vendors and the absorption of the world of work at a significance level of 5%.

The results of this study are in line with research conducted by Winda Cahyani W, Tri Atmadji S and Heru Wahyu Herwanto (2017) which states that the implementation of Field Work Practices has specific objectives, namely: (a) preparing students to learn to work independently and in teams; (b) improve the status and personality of the students so that they interact, communicate, and have a high sense of responsibility and discipline; (c) provide opportunities and guarantees for students who have the potential to become skilled workers based on the recognition of specified professional standards.

3. The Effect of Machining Engineering Skills Competence and Its Relevance to the Implementation of PKL (Field Work Practices) on Readiness to Enter the World of Work

Based on the results of the SPSS test using the Multiple Correlation Test, it can be seen that there is a relationship between Expert Competence and PKL Implementation together on readiness to enter the World of Work has a positive and significant relationship with a Medium correlation range of 0.560.

The value of the F Test Hypothesis (Simultaneous) obtained the F Count 23.300 > F Table 3.09 with a significant value of 0.000 <0.05 which indicates that the regression model of the Expertise Competency (X1) variable and the PKL Implementation (X2) simultaneously has a positive and significant effect. to the World of Work (Y).

This study is in line with previous research proposed by Herminanto that factors that influence readiness to enter the world of work include external practice experience and learning achievement before work (Herminanto, 1992). In this case, it can be interpreted that Field Work Practice is a place where students can add practical experience outside of school learning.

5 Conclusion

The results of this investigation provide the following conclusions:

1. There is an Influence between Machining Engineering Skills Competence and the World of Work.

2. There is an Influence between the Implementation of PKL (Field Work Practices) and the Absorption of the World of Work.

3. There is a significant influence and correlation of Machining Engineering Expertise Competence with the Implementation of PKL (Field Work Practices) on Readiness to enter the World of Work.

6 Suggestions

The investigators made several suggestions, namely:

1. In addition to preparing students' Skill Competencies in implementing PKL (Field Work Practices), schools must also pay attention to the attitudes of students before implementing PKL (Field Work Practices).

2. It is hoped that schools will further improve the learning process and practices in order to better support the competence of students and further hone their abilities to be more competent.

3. It is expected that the school in placing students who carry out PKL (Field Work Practices) will really pay attention to whether the company is in accordance with the competencies possessed by students.

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