The Influence of Learning Interest and School Environment on Learning Difficulties in the Cost Planning and Construction Scheduling Elements of Phase F/XI DPIB at SMK Negeri 5 Semarang

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ABSTRACT

This study aims to determine whether there is an influence of learning interest and school environment, both partially and simultaneously, on learning difficulties in the cost planning and construction scheduling elements of Phase F/XI DPIB at SMK Negeri 5 Semarang. This research uses a quantitative approach and is ex-post facto in nature. The population in this study consists of all Phase F (XI) Design Modeling and Building Information students, totaling 107 students. The sampling in this study used a probability sampling technique with simple random sampling. The number of samples used was 52 students. Data collection techniques used questionnaires, which were then analyzed using multiple linear regression tests. The results showed a simultaneous significant influence between learning interest and school environment on learning difficulties by 48.4%. Meanwhile, partially, learning interest had a significant influence on learning difficulties by 4.18%, and the school environment had a significant influence on learning difficulties by 10.25%. The conclusion of this study is that there is an influence of learning interest and school environment, both partially and simultaneously, on learning difficulties.

Keywords: *Learning Interest, School Environment, Learning Difficulties*

1. INTRODUCTION

Education plays an important role in enlightening the nation. Education is divided into two types: formal and non-formal education. One of the formal institutions that prepares its graduates with skills in a particular field is vocational education. Vocational High Schools (SMK) play a role in preparing students to be ready to work in specific fields [1]. The process involves acquiring knowledge, skills, behaviors, attitudes, and developing personality [2]. In the learning process, students sometimes experience learning difficulties. Learning difficulties are conditions where students cannot learn smoothly due to obstacles or disturbances during the learning process, Vocational High Schools (SMK) like SMK Negeri 5 Semarang play a role in producing graduates who are professionals in their field. At SMK Negeri 5 Semarang, one of the programs is Building Information Modeling Design. Within the building information modeling design program, there is a productive element called Cost Planning and Construction Scheduling. Cost Planning and Construction Scheduling, formerly known as Cost Estimation, aims to estimate the costs required for materials, wages, and other expenses related to the implementation of a project [4].

Based on previous studies with similar patterns, such as the study by Kamila & Abduh stating a significant influence of learning interest on learning difficulties [9], and the study by Nuridzul indicating that the school environment has a negative and significant impact on learning difficulties [10], the researcher conducted a study to explore the influence of learning interest and the school environment on learning difficulties in the cost planning and construction scheduling elements of Phase XI in the Building Information Modeling and Design program at SMK Negeri 5 Semarang.

2. METHODOLOGY

2.1 Type of Research

Based on the approach, the research method used in this study is quantitative research. Quantitative method or traditional method is a method that has been used for a long time and has become a tradition to be used. It is called quantitative method because the data used are in the form of numbers and employ statistical analysis [11].

This research is ex-post facto in nature, where the dependent variable, which is learning difficulties, is something that is currently or has already occurred, so the researcher does not manipulate variables during the research process. Ex-post facto is used to determine factors that lead to these occurrences [11]. The data analysis technique used in this study is parametric statistics with multiple regression analysis.

2.2 Location of Research

This research was conducted at SMK Negeri 5 Semarang, located at Jl. Doktor Cipto No. 121, East Semarang District, Semarang City, Central Java.

2.3 Population and sample

This research focuses on students in Phase F/XI of the Building Information Modeling Design program at SMK Negeri 5 Semarang who have already studied or are currently studying the elements of cost planning and construction scheduling. The population of the study consists of 107 students. Sampling in this research used probability sampling technique, specifically simple random sampling. This technique was chosen because the sample taken from the population is considered homogeneous [11]. The sample size was determined using a formula, resulting in a sample size of 52 students.

2.4 Variables of Research

This research uses 3 variables: learning interest and school environment as independent variables, and learning difficulties as the dependent variable.

2.5 Data Collection Techniques

The interviews were conducted as a preliminary study to identify the issues to be researched. This study employed unstructured interviews, meaning the interviews were not conducted using a systematic guide. The researcher focused more on approaching the respondents to understand the issues to be studied.

Data collection for the research is conducted using a questionnaire. A questionnaire is a data collection technique where respondents are presented with a set of written statements or questions to answer [11]. In this study, the questionnaire consists of statements aimed at testing the influence of learning interest and school environment on learning difficulties.

2.6 Data Validity Techniques

2.6.1. Validity Test

This research employs content validity and construct validity testing. Content validity testing is used to determine whether the questionnaire is suitable for use in the study. This validity is evaluated based on experts' opinions. After the instrument is created, it is consulted with experts who are asked to provide opinions on whether the instrument is suitable as is, needs improvement, or requires total revision [11].

Construct validity testing is used to determine whether the questionnaire used in data collection for the research is valid or not. A valid instrument means that the measurement tool used to obtain data is valid; validity here means that the instrument can effectively measure what needs to be measured [11].

2.6.2 Reliability Test

Reliability testing serves to measure the consistency of a questionnaire in a study. An instrument is considered reliable if responses to questions are consistent or stable. A reliable instrument is one that, when used multiple times to measure the same object, produces consistent data [11].

3. RESULTS AND DISCUSSION

3.1 Research Data

Learning interest consists of 12 statement items, with the indicator "participation in activities" being the most influential among the indicators present. School environment comprises 12 statement items, with the indicator "materials and presentation" being the most influential among the indicators present. Learning difficulties consist of 8 statement items, with the indicator "variation in learning outcomes within a study group" being the most influential among the indicators present.

3.2 Results of Data Analysis

3.2.1 Preliminary Analysis Test

The use of preliminary analysis tests is conducted to determine whether the research data obtained can be used or not. Preliminary analysis tests are tests conducted to meet the criteria for data that can be used before conducting hypothesis testing.

3.2.1.1 Normality Test

The normality test is used to determine whether data is normally distributed or not. In this test, data is considered normal if it has a significance value > 0.05 under Asymp.sig (2-tailed). Here are the results of the Kolmogorov-Smirnov normality test.

Table 1. Kolmogorov-Smirnov Normality Test

The Kolmogorov-Smirnov normality test shows a significance value (Asymp. Sig. 2-tailed) of 0.200, which is greater than 0.05. From these results, it can be concluded that the data used in this study is normally distributed.

3.2.1.2 Multicollinearity Test

Good data is characterized by the absence of multicollinearity. Data is considered free from multicollinearity if it has tolerance values > 0.10 and VIF (Variance Inflation Factor) values < 10.

Based on the table output, it is noted that the tolerance value is 0.480, which is above (>) 0.10. Additionally, the VIF (Variance Inflation Factor) value is 2.085, which is less than (<) 10. This indicates that there is no multicollinearity or high correlation among the independent variables. Below is the table output of the multicollinearity test.

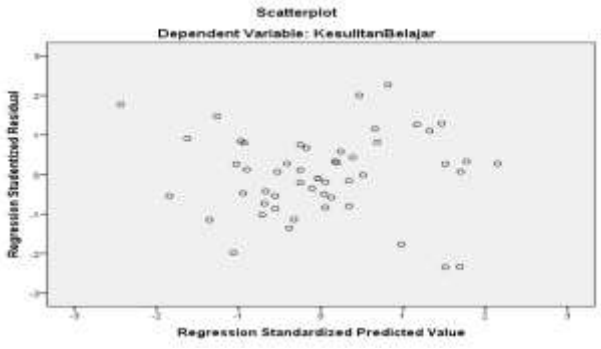
Table 2. Multicollinearity Test

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	Learning interest	.480	2.085
	School Environment	.480	2.085

3.2.1.3 Heteroskedasticity Test

One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
N		52
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	3.10987027
Most Extreme Differences	Absolute	.063
	Positive	.063
	Negative	-.052
Test Statistic		.063
Asymp. Sig. (2-tailed)		.200

Good data is characterized by the absence of heteroskedasticity. Data is considered free from heteroskedasticity if the scatterplot does not exhibit a specific pattern and spreads randomly above and below zero on the Y-axis. Below are the results of the heteroskedasticity test.



Picture 1. Scatterplot graph.

From the scatterplot graph, it can be observed that the data points are scattered randomly and do not form a specific pattern. This indicates that the data does not exhibit heteroskedasticity.

3.2.2 Multiple Linear Regression Test

Multiple linear regression analysis is conducted to test hypotheses or initial assumptions in this research.

Table 3. Output Coefficients

Model		Unstandardized Coefficients	
		B	Std. Error
1	(Constant)	40.972	2.662
	Learning interest	-.226	.110
	School Environment	-.364	.114

Based on the multiple linear regression results, the regression equation obtained is follows.

Y = 40,972 – 0,226.X1 – 0,364.X2

The constant (intercept) of 40.972 indicates that when the variables learning interest (X1) and school environment (X2) are both zero, the difficulty in learning variable (Y) is 40.972. This suggests the baseline level of learning difficulty in the absence of any influence from learning interest and school environment. The beta coefficient for learning interest (X1) is -0.226, meaning that learning interest influences learning difficulty. Specifically, a one-unit increase in learning interest results in a decrease of 0.226 units in learning difficulty, holding all other variables constant. Similarly, the beta coefficient for school environment (X2) is -0.364, indicating that school environment influences learning difficulty. A one-unit increase in school environment quality leads to a decrease of 0.364 units in learning difficulty, with all other variables held constant.

3.2.2.1 F Test (Output ANOVA)

The ANOVA output is used to determine the simultaneous influence of learning interest and school environment on learning difficulty. Decision-making is based on the F-value and a significance level of 0.05. If the significance value (sig) is less than 0.05 and the calculated F-value (F calculated) is greater than the critical F-value (F table), then H0 (null hypothesis) is

rejected and H1 (alternative hypothesis) is accepted; otherwise, the decision is reversed.

T**able 4.** Output Anova

Model		F	Sig.
1	Regression	24.915	.000
	Residual		
	Total		

From the table above, it can be concluded that the calculated F-value (24.915) > the tabular F-value (3.19) and the significance value (sig.) of 0.000 < 0.05. Therefore, H0 (null hypothesis) is rejected and H1 (alternative hypothesis) is accepted, indicating that there is a simultaneous and significant influence of both learning interest and school environment on learning difficulty.

3.2.2.2 T Test (Output Coefficients)

The t-test aims to determine the partial influence of each independent variable on the dependent variable. Decision-making is based on the t-value and a significance level of 0.05. If the significance value (sig) is less than 0.05 and the calculated t-value (t calculated) is greater than the critical t-value (t table), then H0 (null hypothesis) is rejected and H1 (alternative hypothesis) is accepted; otherwise, the decision is reversed.

Table 5. Output Coefficients

Model		t	Sig.
1	(Constant)	15.391	.000
	Learning interest	-2.046	.046
	School Environment	-3.203	.002

Based on the table above, it can be seen that the calculated t-value (2.046) > the tabular t-value (2.011) and the significance value (sig.) of 0.000 < 0.05. Therefore, H0 (null hypothesis) is rejected and H1 (alternative hypothesis) is accepted, indicating that there is a partial and significant influence of learning interest on learning difficulty. The negative sign on the t-value indicates that if students have high learning interest, their learning difficulty decreases, and vice versa. If students have low learning interest, their learning difficulty increases. The magnitude of the influence of learning interest on learning difficulty is calculated as $(-2.046)^2$ x 100% = 4.18%.

Based on the table above, it can be observed that the calculated t-value (3.203) > the tabular t-value (2.011) and the significance value (sig.) of 0.000 < 0.05. Therefore, H0 (null hypothesis) is rejected and H1 (alternative hypothesis) is accepted, indicating that there is a partial and significant influence of school environment on learning difficulty. The negative sign on the t-value indicates that if the school environment supports students, or in other words, if there is an improvement in the school environment, then the learning difficulty experienced by students will decrease. Conversely, if the school environment is less supportive or deteriorates, the learning difficulty experienced by students will increase. The magnitude of the influence of school environment on learning difficulty is calculated as $(-3.203)^2$ x 100% = 10.25%.

3.2.2.3 Coefficient of determination

Coefficient of Determination (R2) is a value that represents the extent to which independent variables influence the dependent variable. The coefficient of determination ranges from 0 to 1. The Adjusted R square column value in the Model Summary table is used to determine the magnitude of the independent variables' influence on the dependent variable. A smaller R square value indicates that the ability of the independent variables to influence the dependent variable is limited. The results of the multiple regression analysis in the Model Summary output can be seen in the following table:

Table 6. Output Model Summary

Model	R Square	Adjusted R Square
1	.504	.484

Based on Table 4.2, the Adjusted R Square value indicates that the influence of the variables interest in learning and school environment on learning difficulties is 0.484. Therefore, it can be concluded that interest in learning and school environment significantly influence learning difficulties by 48.4%, while the remaining 51.6% is influenced by other variables not studied in this research.

3.3 Discussion

3.3.1 The influence of interest on learning difficulties.

The results of multiple linear regression coefficients indicate that the influence of learning interest on learning difficulties amounts to 4.18%. This suggests that learning interest plays a significant role in the learning difficulties experienced by students. Students who have a strong interest in learning tend to comprehend the materials better and do not face learning difficulties. This is because they feel pleasure and enthusiasm while studying the materials. Conversely, students who lack interest in learning, particularly in elements like cost planning and construction scheduling, may experience learning difficulties.

3.3.2 The influence of school environment on learning difficulties.

The results of multiple linear regression coefficients indicate that the influence of school environment on learning difficulties amounts to 10.25%. This demonstrates that the school environment plays a significant role in the learning difficulties experienced by students. The school environment serves as a conducive space for students in supporting teaching and learning activities. A good school environment reduces the potential for learning difficulties among students, whereas a less favorable environment can lead to suboptimal learning outcomes and an increased likelihood of learning difficulties.

3.3.3 The influence of learning interest and school environment on learning difficulties.

Interest in learning plays a significant role in the learning process of students. Students who lack interest in the subject matter they are studying tend to have difficulty achieving good results. On the other hand, students who are interested in the subject find it easier to learn and understand the material being studied. Interest in learning provides motivation to students. When learning interest is supported by a good school environment, students are encouraged to study more diligently, leading to achieving maximum results. As a result, the potential for learning difficulties experienced by students decreases.

Besides interest in learning, the school environment also contributes to the learning difficulties experienced by students. The school environment itself is an educational sphere that influences the formation of students' attitudes and can maximize their potential. The school environment also provides lessons that students may not have received in their family environment. A conducive school environment will have an impact on reducing the learning difficulties experienced by students.

4. CONCLUSION

1) Interest in learning and school environment significantly influence learning difficulties in the Cost Planning and Construction Scheduling elements at Phase F/XI DPIB SMK Negeri 5 Semarang by 48.4%.
2) Interest in learning significantly influences learning difficulties in the Cost Planning and Construction Scheduling elements at Phase F/XI DPIB SMK Negeri 5 Semarang by 4.18%.
3) School environment significantly influences learning difficulties in the Cost Planning and Construction Scheduling elements at Phase F/XI DPIB SMK Negeri 5 Semarang by 10.25%.

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