Analysis of the Study Duration and Sleep Duration Influence on the Mathematics Final Examination Score of MA NU Raudlatul Mu'allimin Students

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Abstract.

This research aims to determine the effect of study duration and sleep duration on the final mathematics scores of MA NU Raudlatul Mu'allimin students. This type of research is quantitative research. The sample in this study was 30 students taken using a random sampling technique. The data analysis technique uses multiple linear regression analysis accompanied by partial tests (t-test) and simultaneous tests (F-test). The calculation process uses SPSS. The test results show that study duration and sleep duration do not have a positive and significant effect on the final mathematics grades of MA NU Raudlatul Mu'allimin students.

Keywords: sleep duration, study duration, final math score

1. Introduction

Many factors influence success in student learning. These factors come from within and outside the individual, which will influence the success of student learning [1]. One external factor is the duration of the student's study. Changes in everyone's behavior can also be influenced by the duration of learning. Learning duration itself is the period or length of time a child spends studying or processing learning activities which include reading, writing, listening, and practicing [2].

Each student can set their learning duration. However, students' unpreparedness to manage the duration of study at school or home will become an obstacle in learning which will later have side effects on student learning outcomes. With students' readiness both internally and externally, it will influence the mathematics learning process. Because learning mathematics is a universal science that requires logical and systematic application.

Living creatures must fulfill basic needs to maintain life and sleep is one of the basic needs that humans must fulfill. With good sleep duration, it will improve the quality of life. Having poor sleep duration will have side effects on physiological balance, such as decreased daily activities, easy feeling tired and weak, reduced body immunity, and unstable vital signs [3]. Apart from that, it also affects psychological balance. Several studies that have been conducted to assess the consequences of not getting enough sleep also show that not sleeping one night will hinder innovative thinking processes, flexible decision-making processes, and several other cognitive functions [4].

Things that will be affected by reducing the duration of a child's sleep include disturbed memory storage processes, decreased levels of alertness, the body's guard system and attention, increased daytime sleepiness, and decreased concentration at school.

Everyone has a different sleep duration. Habits depend on the activities carried out. During adolescence, the activity that is often done is hanging out with friends until late at night so that sleep duration is reduced. Therefore, teenagers have less sleep duration.

The problem formulation for this research is Will the duration of studying and the duration of sleep affect the final mathematics grades of MA NU Raudlatul Mu'allimin students?

2. Method

The type of research used in this research is a quantitative research method. Quantitative research is a process of finding knowledge that uses data in numbers as a tool to analyze information about what we want to know. Quantitative research methods use research data with the help of statistical tools to measure data and generalize results from samples that are relatively large and representative of the population.

Population is the entire collection of elements that have several general characteristics, which consist of areas to be researched [5]. The population in this study was 500 MA NU Raudlatul Mu'alimin students. The sample is a sub or part of a group of the population selected for use in research, totaling 30 students. The sampling technique in this research uses a probability sampling method, namely random sampling using a simple random sampling technique.

One important factor in the success of research is data collection techniques [6]. The data collected will be used to solve problems in research through distributing questionnaires. The data collection technique was carried out by providing a Google Form which was distributed to MA NU Raudlatul Mu'alimin students.

Data analysis in quantitative research is directed at answering the problem formulation. In this research, data analysis techniques use statistical methods and carry out calculations using SPSS and Microsoft Excel tools [7].

We conducted some tests before running the Regression Test, which are Normality, Independence, Linearity, and Homoscedasticity tests. The normality test is carried out on the variables to be studied. The independent variable (X_1) is the student's study duration, the independent variable (X_2) is the student's sleep duration, and the dependent variable (Y) is the student's mathematics score in the odd semester. The linearity test is used to determine whether each independent variable as a predictor has a linear relationship or not with the dependent variable before testing the hypothesis. The Independence Test can be used to test the independence (independence) of two categorical variables. Variables are not related to each other if the variables are independent (independent). And the two variables are interconnected if the two variables are not independent (dependent). In linear regression there are expected (Homoskedasticity Cases) and unexpected (Heteroscedasticity) values. It is said to be homoscedasticity if the residual value for each predicted value varies, and the residual value is homogeneous.

We use Multiple linear regression which involves two independent variables [8]. The independent variable becomes a value predictor (manipulation). Multiple linear regression analysis was used to get an idea of the influence of the independent variables (sleep duration and study duration) on the dependent variable (final mathematics score).

The coefficient of determination (R^2) shows the ability of the independent variable model to explain the dependent variable. However, because the use of the coefficient of determination can increase along with the addition of independent variables, the coefficient of determination cannot prove the relationship between the addition of the independent variable and the dependent variable. So, we can use Adjusted R Square as a definite reference for R^2 itself. Because the Adjusted R Square value has been adjusted, it can be ensured that the addition of independent variables is related to the dependent variable.

The F statistical test is used to show the influence of the included independent variables that have a joint (simultaneous) influence on the dependent variable. The t-statistical test is used to show the influence of the included independent variable which has its own (partial) influence on the dependent variable. Apart from that, the t-statistical test is used to test the partial regression coefficient of the independent variable. It contains the type of research, time, and place of research, target/aims, research subjects, procedures, instruments, and data analysis techniques as well as other things related to the research method. Targets/objectives, research subjects, procedures, data and instruments, and data collection techniques, as well as data analysis techniques and other matters related to the research method, can be written in sub-subchapters, with sub-subheadings.

3. Result and Discussion

Table 1 shows the Linearity test result. If the Sig Linearity value is > 0.05, it can be concluded that there is a linear relationship between the independent and dependent variables. The linearity value is 1,000 and more than 0.05, so sleep duration and study duration have a linear relationship with the final mathematics score.

Table 1. Linearity Test

ANOVA Table

			Sum of Squares	df	Mean Square	F	Sig.
Unstandardized Residual * Unstandardized Predicted Value	Between Groups	(Combined)	165.957	13	12.766	.247	.993
		Linearity	.000	1	.000	.000	1.000
		Deviation from Linearity	165.957	12	13.830	.268	.987
	Within Groups		826.000	16	51.625		
	Total		991.957	29			

While Figure 1 shows the Homoscedasticity Test. From the scatter plot, we can see that the heteroscedasticity does not occur.

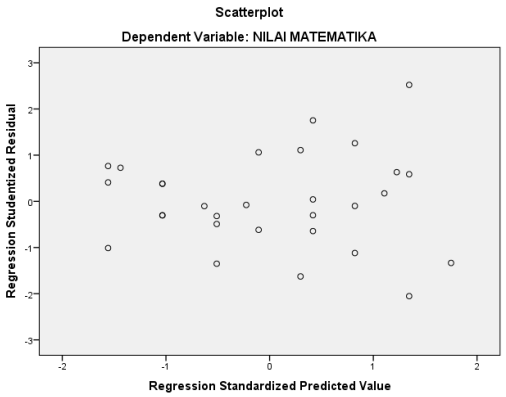

Figure 1. Homoscedasticity Test

We use SPSS and we obtain the regression equation as follows.

$$Y = 91{,}530 - 0{,}441X1 - 1{,}705X2$$

Based on the regression equation above, the following explanation can be obtained the intercept is 91.530. It shows that if the study duration and sleep duration variables have a constant value, then the final mathematics value variable will have a value of 91.530. The first coefficient is -0.441. It shows that if there is an increase in the learning duration variable, it will result in the final mathematics score variable decreasing by 0.441. While the next coefficient is 1.705. It shows that if there is an increase in the sleep duration variable, it will result in the final mathematics score variable decreasing by 1.705.

Based on the calculations, a significance value of 1.397 > 0.01 is obtained, so it can be concluded that H_0 is accepted and H_1 is rejected, meaning that all independent variables (study duration and sleep duration) together do not have a significant influence on the dependent variable (final mathematics score).

The t-test was carried out to partially test the influence of the independent variables, namely study duration (X_1) and sleep duration (X_2) on the dependent variable, namely purchasing decisions (Y).

Table 2. T-Test

Variable	t tab	t obs	Criteria
Study Duration	2,052	-0,384	H1 is rejected
Sleep Duration	2,052	-1,582	H1 is rejected

Based on the table above, the study duration and sleep duration variables do not have a positive and significant influence on the final mathematics score. Based on calculations, the coefficient of determination (R^2) is 0.088, which means that the independent variables (product quality, price, and advertising) can explain the value of the dependent variable, namely (final mathematics value) of 8.8% and the remaining 91.2% is explained. by other variables not discussed in this study. The Effect of Study Duration and Sleep Duration on Final Mathematics Grades. In this study, study duration and sleep duration did not have a positive and significant effect on the final mathematics score. This means that the final mathematics score is not seen from the duration of studying and the duration of sleep. This is contrary to the results of research by Susanti [9] that more students have good sleep patterns and good achievements, namely 18 students (58%) compared to students who have good sleep patterns but whose learning achievements are sufficient, namely 8 students (26%). There is a significant influence of study duration on students' mathematics learning outcomes [10]. Long study duration will have a positive impact on students in terms of learning outcomes.

4. Conclusion

Based on the results of the existing research and discussion, the conclusions that can be drawn are: 1) Study duration does not have a positive and significant effect on the final mathematics score, and 2) Sleep duration does not have a positive and significant effect on the final mathematics score. Based on the results of the research and discussions that have been carried out, several unknown factors caused this research to be unsuccessful. Advice that researchers can give is to conduct further research on the relationship between study duration and sleep duration on final mathematics scores.

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