

## Research Article

# The effect of online games on students' mathematics learning outcomes at SMPN 1 Sintuk Toboh Gadang

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## ABSTRACT

The purpose of this study was to see the significant effect of online games on students' mathematics learning outcomes at SMP N 1 Sintuk Toboh Gadang. The approach used in this study is a quantitative approach with the type of correlational research, namely research conducted between two or more variables that aims to find out whether there is a relationship and if there is, how close the relationship is and whether or not the relationship is meaningful. The instrument used in this study was a questionnaire or questionnaire and learning outcomes test used to determine the effect of online games on students' mathematics learning outcomes. The analysis used in this study was simple linear regression analysis. The results showed that: 1. The mathematics learning outcomes of grade VIII SMPN 1 Sintuk Toboh Gadang students who liked to play online games varied widely 2. There was an influence between playing online games on the mathematics learning outcomes of eighth grade students of SMPN 1 Sintuk Toboh Gadang, which was indicated by  $F_{count} = 47,85 > F_{table} = 4.6$  this can also be seen from the regression coefficient value of  $-0.882$ . The simple linear regression equation obtained is  $Y = 184.41 - 0.6X$  where Y is the result of learning mathematics and X is the online games variable. The conclusion is that there is a negative effect of online games on students' mathematics learning outcomes in class VIII SMPN 1 Sintuk Toboh Gadang, both up and down and all independent variables (X) have an effect on the dependent variable (Y) of 77.7%.

**Keywords:** online games; mathematics learning outcomes; mathematics learning;

## 1. INTRODUCTION

Education is basically an effort to provide certain knowledge, insight, skills, and expertise to humans so that they can develop their talents and personalities. In order to be able to deal with any changes that occur due to advances in science and technology in the future, humans try to develop themselves with education in order to keep up with existing developments. Therefore, education issues need to get more attention and handling related to quality, quantity, and relevance. The invention of information technology develops on a mass scale. Technology has changed the shape of society, from a local world community to a global world community. A world that is very transparent to the development of information, transportation, and which is so fast and so big that it affects human civilization, so the world is dubbed as the big village, which is a big village, where people know each other and greet each other (Burhan Burgin, 2015). If it is implicated in the world of education, it will be very influential, especially among students. They utilize technology for communication and entertainment media such as online games. Online game play for teenagers, junior to middle level students and even children is not a new thing in this day and age. Many facts that the author encountered, with a survey of internet cafes in Sintuk Toboh Gadang, it is not uncommon for teenagers and even children who are playing online games. The internet cafe business that is behind the development of online games is mushrooming in big cities in Indonesia and even to the countryside. The development of internet cafes in Indonesia since the last few years has been seen very rapidly.

The results of a survey on June 10, 2021 that the author conducted in several internet cafes, generally seemed to be filled with students who always came to spend their time playing online games and sometimes they were willing to not go to school just to play online games. This is very ironic, sometimes even the games that are played actually bring the child's personality to a bad character. This condition is also found in SMP N 1 Sintuk Toboh Gadang. In reality in the field what the writer found through observation on June 19, 2021, it was precisely the low mathematics learning outcomes that occurred at SMP N 1 Sintuk Toboh Gadang. It can be seen from the [Table 1](#).

Based on [Table 1](#), it can be seen that the average value of each class on the daily test of 1 odd semester is below the Minimum Completeness Criteria set by SMP N 1 Sintuk Toboh Gadang for the field of mathematics, which is 75.00. This shows that most of the students did not complete the field of mathematics studies. Based on interviews that the author conducted on June 19, 2021 at SMP N 1 Sintuk Toboh Gadang with several students, information was obtained that most

of the students did not like Mathematics subjects, tended to be lazy when studying mathematics and they chose to skip school, then went to internet cafes or game centers around the school to play online games until satisfied.

**Table 1.** Percentage of Completeness Daily Test Score 1 Odd Semester Class VIII SMP N 1 Sintuk Toboh Gadang

Class	Total Students	Average	Completeness Percentage
VIII.2	36	70,06	68,57
VIII.3	38	67,5	47,36
VIII.4	38	64,97	47,36
VIII.5	36	68,11	55,55
VIII.6	37	70,7	59,45
VIII.7	36	62,5	44,44
VIII.8	36	68,36	52,77

Source: Mathematics Teacher for Class VIII SMP N 1 Sintuk Toboh Gadang.

The researcher interviewed with the mathematics teacher at SMP N 1 Sintuk Toboh Gadang on June 19, 2021, he stated that students' mathematics learning outcomes were low, it was influenced by various factors. Among them; the lack of interest and attention of students in mathematics, the lack of activeness of students in participating in mathematics lessons, students are lazy to study at home, and there is a phenomenal thing they do, which is often late to go home because they play first at an internet cafe or games center. to play online games until they are satisfied, sometimes they forget the time and after they finish playing online games then they go home and sometimes wait for a hungry stomach first, then they go home and don't want to do the assignments or homework given by them. teacher. Then the parents complained about this condition. Online games are a form of game that is connected via the internet network. Online games have a great impact, especially on the development of children and one's soul (Candra Zebeh Aji, 2012). Although we can socialize in online games with other players, online games often make players forget social life in real life and children lack time and concentration to study well so that it has an impact on the low learning outcomes obtained by students. This is a big problem in the world of education, including for mathematics. In learning mathematics, students are required to be serious and actively involved in it, so that learning objectives can be achieved, this is in stark contrast to the current condition of students who tend to dislike mathematics and prefer to skip school. This is due to the lack of study time caused by the time spent playing online games. Therefore, the author is interested in researching how the effect of online games on students outcomes learning mathematics grade VIII at SMP N 1 Sintuk Toboh Gadang.

## 2. RESEARCH METHOD

This study uses a survey approach. According to Winarmo quoted by Suharsimi Arikunto, survey is a way of collecting data from a number of units or individuals at the same time (Suharsimi Arikunto,2016). The nature of this research is Ex Post Facto. Ex Post Facto research is a systematic empirical investigation without direct control of independent variables because these variables have occurred or because these variables basically cannot be manipulated. It is called expost facto because in this study no treatment was made on the object of research but only revealed facts to the respondent(Tatag,2010).

The population that the researchers took in this study were all eighth grade students who like to play online games at SMP N 1 Sintuk Toboh Gadang, who were registered in the 2021/2022 school year, totaling 112 people.The sample is part or representative of the population under study. The sample selected must be able to represent and describe the overall characteristics of the population. So in determining the sample, normality, homogeneity, and average similarity tests were carried out. If the test has been carried out and the class is proven to be normally distributed, homogeneous and has the same average, then the sample is selected by random sampling technique. If the population is homogeneous, the sample size does not affect the representative level of the sample. For such a population, a small sample is sufficient. In sampling, Suharsimi Arikunto explained: If the subject is less than 100, it is better to take all so that the research is a population study. However, if the number of subjects is large, it can be taken between 10-15% or 20-25% or more, depending on the ability of time, energy, funds, the narrow area of observation and the size of the risk borne by the researcher. Based on the reasons above, the authors took a research sample of 15% of the total sample population, namely 112 students, so the number of research samples was 16 students. Sampling of the population in this study using random sampling technique. The data collection techniques used in this study were: Questionnaire or Test Methods.

These statistics are used to analyze the data by making generally accepted conclusions. The characteristic of inferential data analysis is the use of certain statistical formulas (eg t test, F test, etc.). Thus, inferential statistics serves to generalize the results of a sample study to the population(Sambas,2019). To perform the statistical test, the following tests were carried out: To perform the statistical test, the normality test was conducted to test whether in a regression model, the dependent variable, the independent variable, or both have a normal distribution, or not. The regression model is said to be good if the distribution is normal or close to normal. Researchers conducted a normality test using a tool in the form of Minitab Software.

To see data that is normally distributed, we can use the interpretation of the P-value, that is, the data is normally distributed if the P-value is greater than the real level = 0.05. The next test is linearity test. The linearity check of the data is carried out with the help of the SPSS application, with test criteria, if the value of r (probability value/critical value) is

less than or equal to ( $\leq$ ) than the specified level so that the data has a linear pattern, otherwise the data is not linearly patterned. The next stage is Hypothesis Testing which begins with a Simple Linear Regression Equation. Simple regression is a linear regression that estimates the magnitude of the coefficients resulting from a linear equation, involving one independent variable to be used as a prediction of the value of the dependent variable. The general formula for simple linear regression is:

$$Y = aX + b$$

**Information:**

Y = Dependent variable, namely learning outcomes

a = Constant

b = Regression coefficient

X = Independent variable that is online game.

The formula that can be used to find the values of a and b is:

$$a = \frac{\sum Y_i - b \sum X_i}{N} = Y - bX$$

$$b = \frac{N \cdot (\sum X_i Y_i) - \sum X_i \sum Y_i}{N \cdot \sum X_i^2 - (\sum X_i)^2}$$

Calculating Correlation Coefficient, According to Sudjana to calculate the correlation coefficient (r) obtained by the formula:

$$r = \frac{n \sum X_i Y_i - (\sum X_i)(\sum Y_i)}{\sqrt{\{n \sum X_i^2 - (\sum X_i)^2\} \{n \sum Y_i^2 - (\sum Y_i)^2\}}}$$

**Information:**

r = correlation coefficient

n = data size

X<sub>i</sub> = Independent variable to i

Y<sub>i</sub> = Variable bound to i

The price of r moves from -1 and +1, the negative sign indicates a negative correlation and the positive sign indicates a positive correlation, specifically for r = 0, this means that there is no linear relationship between the two variables. The hypotheses to be tested are: H<sub>0</sub>: There is no significant effect of online games on students' mathematics learning outcomes in class VIII SMP N 1 Sintuk Toboh Gadang).

H<sub>1</sub>: There is a significant effect of online games on the mathematics learning outcomes of students in class VIII SMP N 1 Sintuk Toboh Gadang).

The statistical test used is the F test. To determine the value of the F test proposed by Sambas Ali Muhidin and Maman Abdurahman by comparing the value of the F test with the value of the F table according to the existing test criteria. If F<sub>hit</sub> > F<sub>tab</sub> then H<sub>0</sub> is rejected and H<sub>1</sub> is accepted so that it can be concluded that there is a significant effect of online games on mathematics learning outcomes for class VIII students at SMP N 1 Sintuk Toboh Gadang.

### 3. RESULTS AND DISCUSSION

#### 3.1 Results

The research data described consist of independent variables and dependent variables, the independent variables are aspects of online games and the dependent variable is student learning outcomes. This research data is the result of research conducted at SMP Negeri 1 Sintuk Toboh gadang.

##### a. Description of Online Games

The online game data was obtained through filling out the research instrument in the form of a Likert scale questionnaire on 16 eighth grade students of SMP N 1 Sintuk Toboh Gadang. Based on the data collected:

**Table 2.** Description Online Games Data

Description (X)	Value
Maximum Value	216
Minimum Value	150
Mean	182,94
Standard Deviation	22,77

Based on the questionnaire consisting of 52 items with a scale (1-5), the theoretical score range is (52-260) and the average theoretical score (ideal mean -Mi) is 156 and the ideal standard deviation (SDi) is 34.67. Meanwhile, from the research data obtained a minimum score of 150 and a maximum score of 216. The average value is 182.94 and the standard deviation is 22.77 (Table 2). Based on these data, it shows that the average score of empirical data (182.94) is higher than the theoretical average score (156). This means that the tendency of students to play online games is high.

**Table 3.** Trend Distribution of Online Game Variables

Score	Frequency		Category
	Absolute	Relatively %	
$x \geq 190,67$	6	37,5	High
$190,67 > x \geq 156$	8	50	Sufficient
$156 > x \geq 121,33$	2	12,5	Less
$x < 121,33$	0	0	Low
$\Sigma$	16	100	

Based on the **Table 3**, it can be concluded that the eighth-grade students of SMP N 1 Sintuk Toboh Gadang who have a high online game tendency are 6 students or 37.5%, the online game tendency is quite high as many as 8 students or 50%, the online game tendency is less than 2 students or 12.5% and the tendency of online games is low as much as 0 students or 0%. Thus, it can be concluded that the eighth-grade students of SMP N 1 Sintuk Toboh Gadang have a fairly high tendency for online games.

### b. Description of Mathematics Learning Outcomes

Data on mathematics learning outcomes were obtained through learning outcomes tests on 16 eighth grade students of SMP N 1 Sintuk Toboh Gadang. Based on the data collected.

**Table 4.** Description Mathematics Learning Outcomes

Description (Y)	Value
Maximum Value	99
Minimum Value	51
Mean	73,81
Standard Deviation	17,75

Based on the learning outcomes test, the highest score was 99 and the lowest score was 51 (Table 5), then the theoretical score range was (51-99) and the average theoretical score (ideal mean -Mi) was 75 and the ideal standard deviation (SDi) was 8. The distribution of the tendency of the mathematical value variable is as follows:

**Table 5.** Trend Distribution of Learning Outcomes Variables

Score	Frequency		Category
	Absolute	Relatively %	
$x \geq 83$	5	31,25	High
$83 > x \geq 75$	2	12,5	Sufficient
$75 > x \geq 67$	4	16	Less
$x < 67$	5	31,25	Low
$\Sigma$	16	100	

Based on the **Table 5**, it can be concluded that the eighth grade students of SMP N 1 Sintuk Toboh Gadang who have high mathematics learning outcomes are 5 students or 31.25%, 2 students or 12.5% mathematics learning outcomes are sufficient, 4 students less mathematics learning outcomes or 16%, and low mathematics learning outcomes as many as 5 students or 31.25%. Thus, it can be concluded that the mathematics learning outcomes of class VIII students of SMP N 1 Sintuk Toboh Gadang are high.

### c. Research Data Analysis

To perform statistical tests, several requirements of analysis must be carried out, namely Normality and Linearity tests. Based on calculations using the MINITAB software, it was obtained for the online game variable and learning outcomes the P-Value value was greater than the level used (ie 0.05) successively for online games = 0.351, learning outcomes = 0.476 so that the online game variables and results The study studied followed a normal distribution. Linearity Test, Based on the results of calculations using SPSS 16, it was obtained that the value of r was smaller than the value of used (ie 0.05), or  $0.015 < 0.05$ , so that the x variable over the y variable had a linear pattern. Furthermore, Hypothesis Testing is carried out, considering that the requirements needed as a linear regression model between the dependent variable Y and the independent variable X have been met, then the next analysis is testing the research hypothesis. The hypothesis of this study is: There is a significant effect of online games on students' mathematics learning outcomes in class VIII SMP N 1 Sintuk Toboh Gadang. Hypothesis testing includes the following:

Simple Linear Regression Equation, after performing manual calculations and the help of SPSS 16 software, a simple regression equation is obtained:

$$Y = 184.41 - 0.6X$$

Based on the regression equation above, it can be explained as follows: The constant (a value) is 184.41 units, meaning that if there is no influence from the X variable or the X variable = 0, then the Y value = 184.41.

The regression equation between Online Game Variables on Mathematics Learning Outcomes is  $Y = 184.41 - 0.6X$ . Based on the regression equation, it means that for each change in the value of the online game variable by one unit, the learning outcomes of mathematics will change by 0.6 units in different directions. Then calculate the correlation coefficient, After doing the calculations, the relationship between online game variables and learning outcomes is -0,882 or  $r_{xy} = -0,882$ . This means, the relationship between online game variables and learning outcomes is high with a negative correlation direction. The final stage is hypothesis testing (using regression significance).

$H_0$ : there is no effect of online games on students' mathematics learning outcomes

$H_1$ : there is an effect of online games on students' mathematics learning outcomes

After the F test, the calculated F value is greater than the F table value or  $47.85 > 4.6$ , it can be concluded that  $H_0$  is rejected. In addition, the author also conducted testing with the help of SPSS 16 software, based on the calculation results, the value of  $\alpha$  or  $0.000 < 0.05$ , so  $H_0$  was rejected. This means that there is a negative effect of online games on students' mathematics learning outcomes in class VIII of SMP N 1 Sintuk Toboh Gadang. After doing the calculations, the value of  $r_{xy}^2 = 0,777$  is obtained. So that  $KD = 77, 7\%$ . This value explains that the online game variable has an effect of 77.7% on learning outcomes while the rest is influenced by other factors.

### 3.2 Discussion

After the data description and data analysis were carried out, a general description of the online game variables, students' mathematics learning outcomes and the influence of online games on students' mathematics learning outcomes was carried out. Based on the results of the calculation of the variable analysis carried out, with the acceptance of the first hypothesis ( $H_1$ ) and the rejection of the null hypothesis ( $H_0$ ) where the calculated F value is greater than the F table value at a significant level of 5% with  $db_{reg} = 1$  and  $db_{res} = 16 - 2 = 14$ , that is  $47.85 > 4.6$ . This means that online games have a negative effect on students' mathematics learning outcomes, with a coefficient of determination of 0.777. These results indicate that the magnitude of the influence of online games on students' mathematics learning outcomes is 77.7%, while the remaining 22.3% is determined by a number of other factors such as internal factors of the students themselves, such as physical factors (health) and psychological factors (motivation, attention). and concentration) or from other external factors, such as friends and teachers. This is in accordance with the opinion of Ngalm Purwanto who said that there are three kinds of educational environment, namely the family environment, school environment and community environment.

The average score of the online game variable in students' mathematics learning is 182.94 with a standard deviation of 22.77. Students who have a high online game tendency are 6 students or 37.5%, a fairly high online game tendency is 8 students or 50%, an online game tendency is less than 2 students or 12.5% and a low online game tendency is 0 students or 0%. The average score of students' mathematics learning is 73.06 with a standard deviation of 17.75. Students who scored above the average were 8 people while the remaining 8 students scored below the average. With some students' math scores in the high category (31.25%). This shows that the increase or decrease in student learning outcomes is influenced by online games which make students tend to be lazy. For this reason, the role of parents and schools is very important in controlling these conditions.

## 4. CONCLUSION

Based on the results of the research data, it is possible to answer the problem formulation, namely there is a negative effect of online games on mathematics learning outcomes for students of class VIII SMP N 1 Sintuk Toboh Gadang 77.7% can be influenced by online game variables, while 22.3% are influenced by other factors, and how much influence online games have on learning outcomes can be shown through the value of Fcount in the simple regression hypothesis test, namely  $F_{count} = 47.85$  which is much larger from  $F_{table} = 4.6$ .

## AUTHOR'S CONTRIBUTIONS

The authors discussed the results and contributed to from the start to final manuscript.

## CONFLICT OF INTEREST

There are no conflicts of interest declared by the authors.

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