

Manogari Sianturi (The Effect Of Online Learning Saturation On The Physics Learning Outcomes Of Students Of Senior High School Baptist Education Foundation Cengkareng Indah Jakarta)

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The Effect Of Online Learning Saturation On The Physics Learning Outcomes Of Students Of Senior High School Baptist Education Foundation Cengkareng Indah Jakarta

Manogari Sianturi 1*

Physical education, Universitas Kristen Indonesia, Indonesia
E-mail: manog_sianturi@yahoo.com

Septina Severina Lumbantobing 2

Physical education, Universitas Kristen Indonesia, Indonesia
E-mail: septinaseverina@gmail.com

Piter Honirius Naitaunus 3

Physical education, Universitas Kristen Indonesia, Indonesia
E-mail: septinaseverina@gmail.com

Gertruida Bailakbak 4

Physical education, Universitas Kristen Indonesia, Indonesia
E-mail: septinaseverina@gmail.com

Otniel Satoko 5

Physical education, Universitas Kristen Indonesia, Indonesia

Abstrak. This study discusses The Influence of Online Learning Saturation on Physics Learning Outcomes of High School Students at the Cengkareng Indah Jakarta Baptist Education Foundation. This research is a quantitative study with the independent variable referred to as variable X (Learning Saturation) and the dependent variable referred to as variable Y (Learning Outcomes). The method used in this study is the surveying method, the number of samples used is 20 students, the data collection technique uses a questionnaire and student learning outcomes for one semester, and the data analysis technique used is the normality test and the linearity test. In the normality test, a significant value is obtained of $0.200 > 0.05$, so the data is normally distributed. From the output, the correlation coefficient is 0.061 and is significantly at 0.797. Because the value of the correlation coefficient is 1.0 and the significance is $0.797 > 0.05$, then H_0 is accepted, and H_a is rejected. This means that there is a significant relationship between learning saturation and learning outcomes at the r count value of $0.061 < 0.444$ r table, and then H_0 is accepted and H_a is rejected. Exposure to person product moment correlation test data shows that variable X to variable Y correlates, with the degree of relationship, namely the correlation being in the form of a negative relationship. The meaning of the negative relationship here is that the higher the learning saturation, the lower the learning outcomes.

Keywords: Quantitative, Survey, Linearity test, Correlation

I. Introduction

The coronavirus outbreak began to hit Indonesia in March 2020, a deadly virus that first appeared in China or more precisely in Wuhan in December 2019, and then this virus began to spread throughout the world. The existence of this outbreak made the Indonesian government begin to stipulate that its citizens implement social distancing or do all their activities at home to break the chain of transmission of the virus so that everything is done at home from worship, work, school, and others. Restrictions on activities in all aspects of life force students to study online from home which causes them to experience boredom. Boredom at both high and low levels affects students' learning achievement (Kristanto, 2017) and reduces students' learning concentration

(Siti Afifah, 2019), in addition, student boredom in learning is also influenced by environmental factors (Rahma, 2022).

The implementation of social distancing by the government of the Republic of Indonesia has resulted in a change in learning methods from face-to-face (offline) learning methods to distance or online learning methods (Napsawati, 2020). Distance learning is carried out from two different places (Napsawati, 2020) by utilizing online learning applications such as Google Meet, Google Classroom, zoom, and Whatsapp with the help of an internet network.

Based on previous expert estimates the pandemic period will be resolved in a short time, but in reality it cannot be resolved perfectly until 2022, requiring students to continue distance learning. Prolonged distance learning makes students experience boredom in learning. Learning boredom is a condition where students begin to feel tired during learning caused by pressure while studying, excessive homework, or other psychological factors. Aspects of Learning Boredom include: (1) Emotional fatigue, (2) Physical fatigue, (3) Cognitive fatigue, and (4) Loss of motivation. These aspects are the main factors that cause boredom in learning (Vitasari, 2016).

Previous research stated that aspects of learning saturation can cause students' interest in learning to decrease, so researchers are interested in examining what aspects of learning saturation are the main factors of online learning saturation on physics learning outcomes experienced by high school students at the Cengkareng Indah Jakarta Baptist Education Foundation (Asih Dwi Lestari, 2021). The purpose of this study was to determine the level of learning saturation in students and the factors that influence student learning saturation at the Cengkareng Indah Jakarta Baptist Education Foundation through an instrument (questionnaire) distributed online to all students.

12 II. Method

This research was conducted at Gading Pluit Hospital in December 2023. This research method was to look for the PDD curve using a solid water phantom with an SSD of 100 cm and a field area of 10x10 cm. After that, the researchers measured the surface dose using a detector before using the bolus and after using the bolus. In this case, the variations in bolus thickness and phantom slab thickness are 0.5, 1 and 1.5 cm. The energy used in LINAC is 6.8 and 10 MeV. There are 2 boluses used, namely a bolus that does not use a mixture and a bolus that uses a mixture of Al_2O_3 . After measuring the detector, the author obtained data on dose values for each parameter that had been measured and found R100 (the distance at which the dose reaches 100%).

The dose value data was analyzed using Excel to obtain the percentage value of increase in surface dose for each specified parameter. Researchers also carried out analysis using OriginPro 8.5 to obtain Percentage Depth Dose graphs for each variation in bolus thickness using the Al_2O_3 mixture or not using the mixture. In this case we can determine the effect of varying bolus thickness on increasing surface dose. The research method used in this study is a quantitative method through a survey. The variables involved in this study consist of 2 variables, namely the independent variable and the dependent variable. The independent variable in this study is learning saturation which is referred to as variable X. The dependent variable in this study is student learning outcomes which is referred to as variable Y. The dependent variable is a variable that is influenced by or is a result of the existence of the independent variable (Sugiyono 2019).

The data collection technique in this study was by distributing questionnaires to 20 respondents of students from the Cengkareng Indah Jakarta Baptist Education Foundation High School who had been determined. The questionnaire used contained statements concerning the learning boredom experienced by respondents when they studied online in Physics at SMA Yayasan Pendidikan Baptist Cengkareng Indah Jakarta. The statements were compiled by paying attention to the principles of writing questionnaires such as the content and purpose of the statement, the language used, the type and form of the statement, the length of the statement, the order of the statement, the physical appearance of the questionnaire and so on. This questionnaire was created via Google Form after which the link was distributed through class representatives and then forwarded to the WhatsApp group of each class so that data collection was faster. In this study, the researcher used a closed questionnaire presented with various choices so that respondents only had to click on the answer option that matched the conditions experienced by the respondents that had been stated in the statement items that had been written by the researcher in the Google Form.

The instrument grid in this study is seen from the aspects of learning saturation which consists of four, namely emotional, physical, cognitive, and loss of self-motivation fatigue (Vitasari, 2016). In this study, each respondent's answer was converted through a Likert scale with negative statements as the measurement of the

The Likert scale is used to measure the attitudes, opinions, and perceptions of an individual or group of people about social phenomena. Through the Likert scale, the variables measured are described into indicators, and then these indicators are used as benchmarks for compiling instrument items in the form of questions or statements (Sugiyono 2019). The instrument developed in this study uses a Likert scale from 1 to 5 with choices of strongly disagree to strongly agree. For the choice of Strongly Disagree (SD) given a score of "5", Disagree (D) given a score of "4", Neutral (N) given a score of "3", Agree (A) given a score (2), and Strongly Agree (SA) given a score of "1" as seen in Table 1.

Table 1. Likert scale in negative statements

Negative Statement	Score
Strongly Disagree	5
Disagree	4
Neutral	3
Agree	2
Strongly Agree	1

Data analysis technique

To analyze the data obtained from data collection, a normality test and hypothesis test are used. The normality test is used to determine whether the sample data studied is normally distributed or not by calculating the value of Sig. (2-tailed) data. Then a hypothesis test is carried out to determine whether there is a significant relationship between learning saturation experienced by students and student learning outcomes by comparing the t-count value to the t-table and calculating the correlation coefficient. The percentage calculation for each answer by respondents uses equation 3.1.

$$P = \frac{F}{N} \times 100\% \quad (1)$$

Where, P is the percentage of respondents' answers, F is the frequency of respondents' answers and N is the maximum number of scores for respondents' answers.

III. Result and Discussion

Student learning saturation is described using a Likert scale with a score range of 1 to 5, with a total of 25 questions to 20 respondents with the criteria for the percentage of student learning saturation as shown in Table 2.

Table 2. Learning saturation criteria

No	Percentage Interval (%)	Category
1	89-99	Very high
2	79-88	High
3	69-79	Moderate
4	59-69	Low
5	49-59	Very low

Based on the responses given by respondents regarding the boredom they experienced at SMA Yayasan Pendidikan Baptist Cengkareng Indah Jakarta, it was calculated and grouped based on the indicators they experienced, which consisted of emotional, physical, cognitive, and loss of motivation, as a whole can be seen in Figure 1.

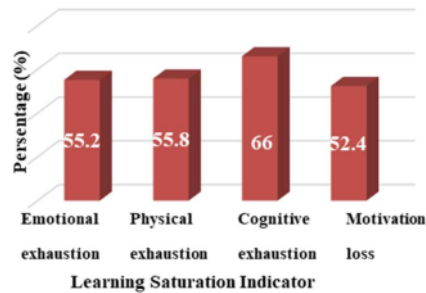


Figure 1. Graph of student saturation percentage based on learning saturation indicators

Based on the graph in Figure 1 shows that from the four aspects of learning saturation indicators experienced, the percentage of student answers obtained was different, namely those experiencing emotional exhaustion as much as 55.2%, physical exhaustion as much as 55.8%, cognitive exhaustion as much as 66%, and loss of motivation as much as 52.4%. Based on the learning saturation criteria and the calculation results of the four saturation indicators surveyed, it can be described that respondents experienced learning saturation which is still classified as low as presented in Table 2.

Based on the four indicators of learning fatigue that were measured, it shows that students experience the highest cognitive fatigue with a percentage of 66%. Cognitive fatigue experienced by students explains that students tend to get too much burden on the brain so that they will become anxious and stressed easily, which will result in the brain's inability to digest the information received properly, forgetting easily, and inability to make good decisions (Murti 2019). The characteristics of cognitive fatigue in question are being reluctant to help in learning activities, losing hope in learning, having difficulty concentrating and forgetting easily in learning, feeling burdened with many learning tasks, and feeling inferior.

This study also revealed that physical fatigue ranks second out of 4 indicators of learning saturation studied. Physical fatigue referred to in this study is a condition where a person finds it physically difficult to do things that are usually done. This physical fatigue hurts a person's health, a few of which are difficulty sleeping or insomnia, lack of sleep causes the hormones released to become chaotic and irregular, making people stressed. This stress can cause headaches that affect appetite (Murti 2019). The characteristics of physical fatigue are feeling tired every day, getting sick easily, having difficulty sleeping, the heart often beats hard, and feeling comfortable studying while lying down.

Emotional exhaustion ranks third out of 4 indicators of learning fatigue. This condition has a negative impact and can affect self-quality, such as being easily angered, resentful, guilty, feeling like a failure, discouraged, indifferent, unable to concentrate or listen to what the teacher says, being cynical towards friends, being blaming, being rigid in thinking, and persisting in not changing (Cherniss 2019). The characteristics of emotional exhaustion are feeling like a failure in learning, feeling guilty and blaming, easily losing control of learning, experiencing excessive fear, and feeling chased by time.

The indicator of loss of motivation in this study is in 4th place out of 4 aspects of learning saturation indicators studied. Loss of motivation in students is characterized by the loss of life goals and enthusiasm for learning. Another form of loss of motivation is psychological withdrawal as a response to excessive stress and dissatisfaction. Individuals who experience motivational saturation for a certain period can cause the learning outcomes achieved to be less than optimal. Learning progress will stagnate, there is no progress in learning. Likewise, learning achievement will continue to decline (Murti 2019). The characteristics of a student who loses motivation are losing enthusiasm for learning, giving up easily, losing interest in learning, feeling that they have no support from those closest to them, and not appreciating the results of their work.

Normality Test Results

The normality test was conducted to determine whether the data of the variables studied are normally distributed. In addition, the normality test also aims to prove that the data from the independent variables in the form of numbers obtained from the results of the research that are spread are by the rules of normality. The rule used to test the normality of the distribution of the data in question is by looking at the condition, namely

if the significance value is > 0.05 then it can be stated that the data is normally distributed, but if the significance value is < 0.05 then the data is not normally distributed. The normality test used in this study is the Shapiro-Wilk method which is part of the classical assumption test. Shapiro Wilk is used because the respondents used only 20 samples. The results of the normality test of the data studied are presented in Table 3.

Table 3. Results Of The Shapiro Wilk Normality Test

Variable	N	Sig.(2-tailed)	Details
Learning Saturation		0.809	Normal
Learning outcomes	20	0.252	

Table 3 shows the results of the normality test of the distribution of learning saturation data and student learning outcomes studied. The results of the calculation of the statistical test values show that the normality test of learning saturation and learning outcomes are 0.809 and 0.252, respectively. Therefore, the significant value obtained is 0.809 which is greater than 0.05, then the learning saturation variable data is normally distributed, as well as learning outcomes which are 0.252 which is greater than 0.05, then the learning outcome variable data is normally distributed. From the normality test that has been carried out on the two variables tested, it is illustrated that the data of the two variables studied are normally distributed.

Hypothesis Test Results

The hypothesis in this study consists of two types, namely the null hypothesis (H_0), which is the hypothesis that states there is no relationship between one variable and another variable, and the alternative hypothesis (H_a), which is the hypothesis that states there is a relationship between one variable and another variable. In this study, the hypothesis test was carried out by comparing the T-table T-count values using the Paired sample test with the criteria: If $T\text{-count} > T\text{-table}$ then the hypothesis H_0 is accepted and H_a is rejected, conversely if $T\text{-count} < T\text{-table}$ then the hypothesis H_0 is rejected and H_a is accepted. The results of the hypothesis test conducted showed that the T-count value was smaller than the T-table ($-3.328 < -2.093$) as seen in Table 4, then hypothesis H_0 is not sufficiently proven to be accepted so it is likely that hypothesis H_a is accepted. The results of this hypothesis test reveal that there is a significant relationship between learning saturation and student learning outcomes at SMA Yayasan Pendidikan Baptist Cengkareng Indah Jakarta.

Tabel 4. Hasil uji hipotesis

Variable	T_table	SD	T-count	df	Sig
Learning Saturation	2.093	9.809	-3.328	19	0.004
Learning outcomes					

The hypothesis in this study consists of two types, namely the null hypothesis (H_0), which is the hypothesis that states there is no In addition to comparing the T-table and T-calculation values to prove whether there is a correlation between learning saturation and student learning outcomes, a Pearson product moment correlation test has been conducted. Based on the calculation of the correlation test, the correlation coefficient (r) value is 0.061, and the significance is 0.797 as seen in Table 5. Because the Pearson-value value is -1 and the significance is $0.797 > 0.05$, this result indicates that the H_0 hypothesis is accepted and the H_a hypothesis is rejected. This means that there is a significant relationship between learning saturation and learning outcomes, this is evidenced by the r-calculation value being smaller than the r-table value ($0.061 < 0.444$) so the H_0 hypothesis is rejected and H_a is accepted. From the presentation of the person product moment correlation test conducted, it can be concluded that the learning saturation variable(X) to the student learning outcome variable (Y), correlates with a moderate degree of correlation in the form of a negative relationship. The negative correlation relationship in question is that the higher the learning saturation, the lower the student learning outcomes.

Table 5. Pearson product moment correlation test

Variable	Sig	P-value	r	Details
Learning Saturation And Learning outcomes	0,797	-1	0,061	There is correlation and significance

IV. Conclusion

From the results of a survey conducted on 20 students of the Cengkareng Indah Jakarta Baptist Education Foundation High School, it can be concluded that they experienced the highest boredom in the cognitive fatigue indicator with a percentage of 66% and the lowest in the emotional fatigue indicator with a percentage of 55.2%. In addition, a negative relationship was found between the variables of learning saturation and student learning outcomes, which means that the higher the learning saturation, the lower the learning outcomes obtained by students.

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