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The Effectiveness of the Application M3 Board Learning Media (Mean, Median, and Mode) in Class VIII Statistics Materials at Lekok NU Middle School

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Abstract

This study aims to determine the effectiveness of applying M3 board media (Mean, Median, Mode) in Class VIII Statistics Materials at Lekok NU Middle School. This type of research is quantitative research. The research results show that: 1) The individual analysis results show the effect of using M3 board media on student learning outcomes in class VIII SMPNU Lekok. This is proven through the results of the independent sample t-test showing a significance value (2-tailed) 0.001 <0.05. Therefore, the hypothesis (Ho) is rejected, and the hypothesis (Ha) is accepted. 2) Student activities related to learning from the aspects observed are categorized as active. This is indicated by the acquisition of an average percentage of students' positive activity, namely 96.2% being active in learning mathematics according to predetermined standards, reaching 75% of students being actively involved in the learning process. 3) The average percentage of students positively responding to learning using the M3 board media is 81.13%. This is classified as a positive response as determined by the standard, reaching 75%. 4) The effectiveness of the media in research is seen in student learning outcomes, student activities, and student responses. The results of the descriptive and inferential analysis of the three effectiveness indicators have been fulfilled, so learning using the M3 board media effectively teaches mathematics to class VIII students of SMPNU Lekok.

INTRODUCTION

Education aims to improve society's quality of life and educate the nation. However, problems still need to be addressed, and the results have not met expectations (Departemen Pendidikan Nasional, 2005). The learning process involving teachers, students, and the learning environment, which influence each other to achieve learning goals, cannot be separated from the world of education. One of the factors that helps students reach their learning goals is media. This is related to students' willingness to learn, and their passive attitude can be reduced when appropriate and varied presses are used in the learning process (Hardianto, 2005). The learning process occurs only by receiving information without understanding it first (Ulya, 2011). In order to improve the quality of education, learning media plays an essential role in the teaching and learning process. Apart from that, students can be motivated and interested in learning on their

own when learning mathematics through learning media.

In general, learning media is a tool to help the teaching and learning process. (Suryani et al, 2018) State that learning media is any form of conveying information by learning theory and can be used for learning purposes by stimulating thinking. According to Asyhar (2012), "learning media" refers to everything that can convey or channel messages from a source in a planned manner to create a conducive learning environment where recipients can carry out the learning process efficiently and effectively.

Apart from that, the effectiveness of learning is also caused by the media or methods applied by the teacher. Therefore, teachers must present strategies to improve student learning outcomes, activities, and responses. Several types of learning media can be applied, including PM3 learning media. M3 board (mean, median, mode) is a medium made from Styrofoam, Manila paper, origami, scissors, double tip, and HVS paper. This teaching aid is used to find the mean, median, and mode in statistics for class VIII. Having these teaching aids can help in the learning process and increase students' interest in learning. Based on the background above, the researcher raised a problem with the title "Effectiveness of implementing the M3 Board learning media (mean, median, mode) in class VIII statistics material at NU Lekok Middle School".

METHOD

This type of research is quantitative research. Quantitative research is an approach that tests specific theories by examining the relationships between variables (Sugiyono, 2011). According to Creswell (2008), quantitative research tests specific theories by examining the relationships between variables. In this quantitative research, experimental research methods were used. Experimental research methods can be interpreted as methods used to find the effect of specific treatments on others under controlled conditions (Sugiyono, 2011). The population is the totality of research objects, which can be humans, animals, plants, air, symptoms, event values, life attitudes, and so on, so these objects can be research data sources (Bungin, 2017). The population in this study were all students in class VIII of SMP NU Lekok Pasuruan

The design in this research is quasi-experimental design, which involves at least two groups. One group is the experimental group, and the other is the control group (Rukminingsih, 2020). The design used is Nonequivalent Control Group Design. In this design, two groups are given a pre-test, then they are given treatment, and finally, they are given a post-test.

Table 1. *Nonequivalent Control Group Design*

Class	Pretest	Treatment	Post-Test
Experiment	O_1	X	O_2
Control	O_3	……	O_4

Source: (Sugiyono, 2017)

Information:
Experiment: Group of students who receive learning using M3 board media
Control: Group of students who were not given treatment
O_1: Experimental group pretest score (before treatment)
O_2: Posttest value of the experimental group (after being given treatment)
O_3: Control group pretest score (before treatment)
O_4: Posttest value of control group (after being given treatment)
X: Treatment or Treatment

This research uses a sampling technique, namely purposive sampling. In this technique, sampling is carried out based on specific objectives (Sugiyono, 2017). The sample used in this research was class VIII-B, an experimental class with 21 students, and class VIII-C, a control class with 15 students.

This research uses instruments to determine the value of the variables studied. The instruments used are student learning outcomes using pretest-posttest, student activity observation sheets, which aim to obtain data about student activities during the ongoing mathematics learning process using M3 Board learning media, and student response questionnaires, which are data collection techniques carried out by asking questions. or written statements for students to answer (Sugiyono, 2009).

Data analysis in this research uses descriptive statistical analysis and inferential statistical analysis. Descriptive statistical analysis discusses data and research subjects by presenting data systematically (Sudjana, 2014). Descriptive statistical analysis analyzes mathematics learning outcomes data, mathematics learning outcomes data, and student response data. Inferential statistical analysis tests the research hypothesis using the t-test and Normalized Gain (N-Gain). However, a normality test is first carried out before testing the hypothesis.

RESULTS

The research data were analyzed using descriptive analysis and inferential analysis.

1. Descriptive statistical analysis

Table 1. Description of Test Results (Pretest-Posttest) in the Experimental Class

Statistics	Statistical Value	
	Pretest	**Posttest**
Many Samples	21	21
Ideal Score	100	100
Maximum Score	53	100
Minimum Score	13	75
Score Range	40	25
Average Score	36,57	89,86
Standard Deviation	11,621	7,709

If learning outcomes are grouped into five categories, the following frequency and percentage distributions are obtained:

Table 2. Pretest Frequency of Experimental Class Students

Value	Category	Frequency		Percentage (%)	
		Pretest	Posttest	Pretest	Posttest
$0 \leq x \leq 54$	Very low	21	0	100	0
$54 < x \leq 69$	Low	0	0	0	0
$69 < x \leq 79$	Currently	0	2	0	9,52
$79 < x \leq 89$	Tall	0	5	0	23,80
$89 < x \leq 100$	Very high	0	14	0	66,66

Meanwhile, the results from the control class are presented in the following table:

Table 3. Description of Test Results (Pretest-Posttest) in the Control Class

Statistics	Statistical Value	
	Pretest	**Posttest**
Many Samples	15	15
Ideal Score	100	100
Maximum Score	40	85
Minimum Score	13	35
Score Range	27	50
Average Score	19.93	51.60
Standard Deviation	5.700	11.211

Table 3 above shows that the average pretest score for class VIII students at SMPNU Lekok in the control class is 19.93 from the ideal score of 100 that students might achieve with a standard deviation of 5.700. The scores obtained by students were from the lowest score of 13, and the highest score was 40, with a score range of 13. The average posttest score in the control class was 51.60 from the ideal score of 100 achieved by students with a standard deviation of 11.211. The scores obtained by students are from the lowest score of 35 and the highest score of 85, with a score range of 50. The frequency and percentage distribution are obtained as follows if learning outcomes are grouped into five categories:

Table 4. Pretest Frequency of Control Class Students

Value	Category	Frequency		Percentage (%)	
		Pretest	Posttest	Pretest	Posttest
$0 \leq x \leq 54$	Very low	15	11	100	73.33
$54 < x \leq 69$	Low	0	3	0	20.00
$69 < x \leq 79$	Currently	0	0	0	0
$79 < x \leq 89$	Tall	0	1	0	06,66
$89 < x \leq 100$	Very high	0	0	0	0

The table above shows that of the 15 students in class VIII-C at SMPNU Lekok, the pretest frequency of control class students scoring in the deficient category was 15 (100%), and none (0%) got scores in the low, medium, and low categories. High, and very high. Meanwhile, the frequency of posttest scores in the deficient category was 11 female students (73.33), three female students in the low category (20.00) and one female student in the high category (06.66), and none (0%) obtained scores in the medium and very categories tall.

a. Description of Observation Results of Student Activities in Learning using M3 board Media (mean, median, mode)

Based on the results of the analysis of student activity observations during the mathematics learning process using the M3 board media, it can be said that the student activities in this research were practical. This can be seen from the percentage of students who answered greetings and prayed earnestly in the outstanding category, as much as 61.91%; in the excellent category, as much as 38.10%; and in the poor categories, as much as 0%, the percentage of listening and paying attention when the teacher reminded them. Again, the material that had been studied previously was in the outstanding category as much as 47.62%, in the excellent category as much as 52.39%, and in the poor categories as much as 0%, the percentage of students answering questions given by the teacher in the outstanding category was 42.86%. , the excellent category was 57.15% and the poor and very poor categories were 0%, the percentage of listening to and taking notes on material presented by the teacher in the very good category was 61.91%, the excellent category was 33.37%, the poor category was 4, 77% and very poor as much as 0%, the percentage of listening and paying attention to explanations from teachers using media in the very good category is 61.91%, the excellent category is 38.10% and the poor and very poor categories are 0%, the percentage of students looks happy and enthusiastic when following learning using M3 board media in the very good category was 57.15%, in the excellent category was 42.86% and in the poor and very poor categories was 0%, the

percentage of students asking questions about material that they did not understand was in the very good category was 38.10 %, the excellent category was 61.91% and the poor and very poor categories were 0%, the percentage of students who recorded conclusions or summaries of material in the very good category was 66.67%, the excellent category was 33.37% and the poor and very poor categories as much as 0%, the percentage of students working on and collecting worksheets given by the teacher in the very good category was 66.67%, the excellent category was 33.37% and the poor and very poor categories were 0%, the percentage answered greetings and prayed earnestly in the very good category was 33.37%, the excellent category was 66.67%, the poor category was 4.77% and the very poor category was 0%. From several activities, the average percentage in the excellent and good categories was 96.2%, and the percentage of students in the poor categories was 0.95%.

b. Description of Student Response Results in Learning using M3 board media (mean, median, mode).

Based on the results of the questionnaire analysis of student responses to learning using M3 board media, it shows that 36.91% of students who responded were pleased, 48.22% of students who responded were happy, 13.69% of students who responded were not happy, and 13.69% of students who received the depressed category was 1.19%. If you add up the positive aspects, namely students who received the very happy and happy categories, it reached 85.13%, and the average score from the negative aspects, namely students who received the unhappy and very unhappy categories, reached 14.88%. Student responses are said to be positive if the average percentage of students' answers to questions prepared by researchers reaches 75%. Thus, learning using the M3 board media (mean, median, mode) received a positive response from students.

2. Inferential statistical analysis

The average student learning outcomes after applying the M3 board learning media (mean, median, mode) were calculated using the t-test. Based on the hypothesis test results, it can be said to be better if the t-test significance level is <0.05 or lower, whereas it can be said to be no better if the t-test significance is > 0.05. The results of student learning data from the experimental and control classes have a sig score. (2-tailed) of 0.001 through a confidence level of 95%. This can lead to the conclusion that Ho is rejected and Ha is approved, which shows that M3 board learning media (mean, median, mode) is preferable to learning without using media for class VIII SMP NU Lekok.

Meanwhile, the average N-gain Score result in the experimental group that used the M3 board learning media in learning was 84.59%, classified as effective according to the N-gain Score calculation. The minimum N-gain score is 63.83, and the maximum value is 100. Meanwhile, the average N-gain score in the control group is 40.070% less effective, with a minimum N-gain Score value of 27.59% and a

maximum value of 76.92%. This leads to the conclusion that learning using M3 board media is effective. Meanwhile, learning without using media is categorized as less effective.

DISCUSSION

This section discusses the results of research conducted at SMPNU Lekok. In this research, the criteria for the effectiveness of the M3 board learning media are reviewed from 3 aspects.

1. Learning Outcomes

Based on the results of data analysis regarding students' mathematics learning outcomes before (pretest) the M3 board media was applied, it showed that in the experimental class and control class, there were no students whose scores reached individual completeness (KKM); in other words, student learning outcomes before applying the M3 board media were satisfactory. It is a deficient category and does not meet the classical completeness criteria. Meanwhile, the analysis results in the experimental class after implementing the M3 board media showed that 21 students reached the very high category and had met the minimum completeness criteria (KKM). Moreover, the data analysis in the control class showed that the posttest results showed that 11 students met the shallow criteria, three met the low criteria, and one met the high criteria and reached the minimum completeness criteria (KKM).

Therefore, it can be said that the experimental class is at high criteria and has met classical completeness. We must first know whether our sample data is normally distributed to conduct hypothesis testing. So, normality data was tested using Kolmogorov Smirnov, and inferential analysis showed that the pretest and posttest data in the experimental and control classes had a normal distribution in terms of words. other P-value > 0.05. Because the data is normally distributed, the data meets the criteria for using the t-test.

Based on the results of the independent sample T-test, the results of student learning data from the experimental class and control class had a score of sig. (2-tailed) of 0.001 through a confidence level of 95%. This can lead to the conclusion that Ho is rejected and Ha is approved, which shows that M3 board learning media (mean, median, mode) is preferable to learning without using media for class VIII SMP NU Lekok.

In the experimental group that used the M3 board learning media in learning, 84.59% were classified as effective according to the N-gain Score calculation. The minimum N-gain score is 63.83, and the maximum value is 100. Meanwhile, the average N-gain score in the control group is 40.070% less effective. Through a minimum N-gain Score value of 27.59% and a maximum value of 76.92%. This leads to the conclusion that learning using M3 board media is effective. Meanwhile, learning without using media is categorized as less effective.

2. Student Activities

The results of observations of student activities in learning using M3 board media among students show that students are active in learning. Student activities are said to be successful/effective if 75% of students appear active in the learning process. Meanwhile, the analysis of student activity observation data shows that the average percentage of student activity in mathematics learning using the M3 board media is 96.2%. It can be concluded that students have actively participated in the mathematics learning process by applying the M3 board media.

3. Student Response

Student responses obtained after conducting this research show that students were happy and looked enthusiastic when learning using the M3 board media from several aspects asked. In general, the average percentage given a positive response to learning using M3 board media is 85.13%, so it can be said to be effective because it has met the student response criteria as a predetermined standard, namely reaching 75%.

4. Effectiveness of M3 Board Media

The effectiveness of the media in this research is seen in student learning outcomes, student activities, and student responses. There is an influence on student learning outcomes from the use of M3 board media on student learning outcomes. The percentage of student activity shows positive student activity, namely 96.2% active in learning using the M3 board media. The average percentage of students who responded positively to M3 board learning was 81.13%.

The three indicators of effectiveness have been met from the descriptive and inferential analysis results, so learning using the M3 board media is effective in mathematics learning for class VIII students at SMPNU Lekok.

CONCLUSION

Based on the research results stated above, it can be concluded that the results of individual analysis found that the use of M3 board media influenced student learning outcomes in class VIII at SMPNU Lekok. This is proven by the results of the independent sample t-test showing a significance value (2-tailed) of 0.001 < 0.05. Therefore, the hypothesis (Ho) is rejected, and the hypothesis (Ha) is accepted. Student activities related to learning from the aspects observed are categorized as active. This is shown by the average percentage of students' positive activity, namely 96.2% active in learning mathematics. The average percentage of students who positively responded to learning using M3 board media was 81.13%.

From the pretest-posttest results, student activities and student responses show that using M3 board media influences student learning outcomes. The percentage of student activity shows positive student activity, namely 96.2% active in learning using the M3 board media. The average percentage of students who responded positively to M3 board learning was 81.13%. It can be said that using the M3 board media is effective in learning mathematics.

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