THE EFFECT OF USING INTERACTIVE LEARNING MEDIA ON STUDENT MATHEMATICS LEARNING ACHIEVEMENT

Nurul Hotimah[1], Lely Lailatus Syarifah[2], Barra Purnama Pradja[3]

Mathematics Education Study Program, Faculty of Teacher Training and Education, University of Muhammadiyah Tangerang

e-mail: nurulkhotimah26904@gmail.com

Abstract

This study aims to determine the effect of the use of Interactive Learning Media on the mathematical learning achievement of grade VIII MTs Al Azhaar um Suwanah students. This study used Quasi-Experimental research method with *Pretest-Posttest Non Equivalent Control Group Design research design*. The population subjects in this study were all students of grade VIII MTs Al-Azhaar um Suwanah, by taking a sample of two classes of 56 students, namely class VIII-1 which amounted to 28 students as the Experimental class and class VIII-2 which amounted to 28 students as the Control class. Data collection techniques using instruments on students' mathematical learning achievement in the form of essays. Based on the results of the data obtained, the highest score on *the Pretest* instrument of the Experimental class was 75, with the lowest score of 50. As for the highest score on *the Experimental class Postest* instrument of 90, with the lowest score of 60. And for the highest score on *the Control class Pretest* instrument of 75, with the lowest score of 55. As for the highest score on the *Control class Posttest* instrument of 85, with the lowest score of 60. Based on the results of t-test analysis of students' mathematical learning outcomes, it can be seen that the calculated t value is 5.894 with a significance of 0.000. A significance value that indicates 0.000. $t < 0.05_{table}$ = 2.005. The data requirements of variable X affect variable Y if tcount = 5.894 > ttable = 2.005. So H0 is rejected and H1 is accepted. This is also supported by the mean value of the experimental class of 81.07 greater than that of the control class of 71.25. Which means that there is an influence of interactive learning media on the mathematical learning achievement of grade VIII MTs Al-Azhaar um Suwanah 1 students.

Keywords: Interactive Learning Media, Powerpoint, Student Mathematical Learning Achievement

INTRODUCTION

The development of the times affects the development of technology that encourages major changes in various aspects of life, one of which is in the world of education. Education is one aspect that determines the intelligence of a nation. Tho"in, (2017: 162) argues that education is a driving force to maintain reliable human resources of a country and society, because education is the best way to improve the quality of a country's human resources. So the conclusion that can be drawn from the explanation above is the need for educational institutions and teachers in carrying out a learning process that can increase intelligence and build enthusiasm for learning to be able to achieve the desired learning outcomes. In addition, an education will be carried out optimally if the learning process is carried out optimally, as an important role holder in the learning process, teachers are required to be able to manage learning starting from lesson planning, implementation, assessment and supervision so that during the learning process it is carried out in accordance with the learning objectives that have been set. The ability of teachers to prepare learning is very influential on the achievements obtained by students, one of which is by preparing and choosing what learning media is suitable for the material to be taught.

Media is a tool that can support success in the teaching and learning process at school or outside school, so that it can be a tool for delivering information or learning materials by teachers to students or vice versa. So that the goals in teaching and learning can be achieved, as well as facilitate and facilitate the learning process. According to Syaiful bahari Djamarah and Azwan Zain, (2020: 121) Learning media are all tools that can be used as a channel of

messages to achieve learning objectives. (Ashar, 2011) said that learning media is a tool in the learning process both inside and outside the classroom, then it is further explained that learning media is a component of learning resources or material media that contains teaching materials in students. an environment that can engage students in learning.

From the results of observations made on Wednesday, March 8, 2023 at Al Azhaar um Suwanah 1, which is addressed at Jl. KH. Hasyim Ashari/Al-Furqon, Gg. Wakaf Rt.03/03 Poris Plawad Utara, Kec. Cipondoh, Tangerang City, Banten. Based on the results of an interview with a mathematics teacher named Lia Andriani, S.Pd, several problems were found in the learning process including lack of accuracy in calculating and solving problems, lack of enthusiasm in learning, lack of interest in learning because they did not understand the material taught, which caused students to respond less and less active during learning, then coupled with a very short learning time. This has an impact on students' low mathematical learning achievement.

One of the learning media that can make students more active and can make it easier for students to receive learning is the use of interactive learning media. Interactive learning media are tools and objects that aim to facilitate the learning process to convey messages or information about the material delivered (Hidayat, 2022). Interactive learning media is a learning media that connects text, sound, moving images and video to facilitate the learning process. Therefore, the use of interactive learning media is carried out in order to provide opportunities for students to be involved in the object to be studied, so that students become more active in the learning process.

Based on the background above, the researcher raised the topic **"The Effect of Using Interactive Learning Media on Student Mathematical Learning Achievement"**

METHODS

The method used in this study is experimental research, aiming to determine the effect of a treatment on research subjects. Experimental research was conducted to determine the cause-and-effect relationship of treatment.

This research includes quasi experimental, while pseudo-experiment is a form of experimental design developed from true experimental design. This design has a control group, but cannot function fully controlling outside variables that affect the conduct of the experiment. (Sugiono, 2012: 114)

According to suryabrata (2010: 92) the goal of Quasi Experimental is to obtain information close to what can be obtained by actual testing under circumstances that allow control and manipulation of all relevant variables.

In this study using the Pretest-Posttest NonEquivalent Control Group Design, which is a design that provides pretest before treatment, and posttest after treatment is given to each group. This study used two classes, then tested first to find out whether the initial state was different between the experimental class and the control class. The experimental class was treated using interactive learning media in the form of Power Point, while the control class remained without using media. Upon completion both grades 8-1 and 8-2 are given a posttest.

The first test aims to determine the cognitive abilities of both groups. This initial cognitive capacity is necessary for use in experimental and control classes. The second test aims to measure student achievement or learning outcomes in the cognitive realm.

The instrument used in this study is in the form of a description test question that has previously been validated, researchers use construct validation where construct validation is

arranged based on relevant theories in consultation with validators or experts in their fields. after that the data is tested using the Reliability Test, then the calculation of the final validation value data is analyzed, carried out by giving values to the Pretest and Posttest instruments that have been given. Statistical hypotheses are also called test hypotheses, which are hypotheses expressed in the form of null hypotheses (H0) and hypotheses (H1) (Supardi, 2017).

The hypothesis proposed in this study is = There is no difference between the average before using interactive learning media and after using interactive learning media and (= There is a difference between the average before using interactive learning media and after using interactive learning media. (H_0)H_1)Furthermore, the data in the Test uses the Prerequisite Test, namely the Normality Test, the Normality Test is carried out to find out the data from the research obtained is normally distributed or not. In the Normality Test, researchers use the SPSS program, then also the homogeneity test aims to find out whether the two groups studied have the same variance or not. If both groups have the same variance, then the group is said to be homogeneous (Sugiyono). Followed by hypothesis testing using a t test conducted to determine whether or not the influence of the use of interactive learning media on students' mathematics learning achievement. The type of t test used is the Paired Sample Test The T test is part of the hypothesis comparison test or comparison test, the paired sample t test aims to determine whether there is an average difference between two paired or related samples. After it is known whether there is an influence from the use of interactive learning media, then proceed to calculate the Effect Size in this study, it will be seen how much influence the use of interactive learning media has on student mathematics learning achievement using effect size calculations. Effect size is a measure of the magnitude of the influence of one variable on other variables, the magnitude of the difference and the relationship that is free from the influence of sample size. through manual calculations by entering the Cohen formula as follows:

$$ES = \frac{\bar{Y}_e - \bar{Y}_c}{S_c}$$

$ES = \dfrac{81.07 - 71.25}{6.577}$

$ES = \dfrac{9.82}{6.577}$

$ES = 1,49$

Keterangan :

ES = effect size value

$\bar{Y}_e$ = The average score of the experimental group

$\bar{Y}_c$ = The average score of the control group

S_c = Standard deviation of the experimental group

The criteria for the magnitude of the effect size are classified as follows:

Table 3.8 Cohen's Standard Formula

Effect Size	*interpretation*
ES < 0,2	Relatively small
0,2 < ES < 0,8	Classified as medium
ES > 0,8	Classified as large

RESULTS AND DISCUSSION

This study discusses how the influence of the use of interactive learning media on student mathematics learning achievement. In general, during the learning process of most students on the Build a Flat Side Room material, students' mathematical learning achievement tends to increase after the application of interactive learning media. Student achievement can be seen from the calculation values of the pretest and postest that have been given and the data to be tested using prerequisite tests and hypotheses with the following data:

Table 2. Normality Test Results

		Kolmogorov-Smirnov[a]		
	Class	Statistic	df	Sig.
Student Learning Outcomes	PreTest Experiments	.129	28	.200[*]
	PostTest Experiments	.189	28	.012
	PreTest Control	.186	28	.014
	PostTest Control	.178	28	.024

Based on the results of the normality test using SPSS 26, the output results show that in *the Kolmogorov-Smirnov Column* Test Of Normality table, it can be known that *the Pre-Test and Post-Test data of* experimental and control class learning outcomes have Sig values. Then it can be concluded that the data in this study are normally distributed.> 0,05

Table 3. Homogeneity Test Results

test of homogeneity of variance					
Student Teaching Outcomes		levene statistic	df1	df2	sig.
	based on mean	.615	3	108	.607

Based on the test table using SPSS 26.0, it can be seen that the significance value in the Based on Mean table is 0.607, because the significance value is more than 0.05, which is 0.607 0.05 > so that the data can be said to be homogeneous.

Table 4. Paired Difference Sample T-Test Results

Paired Samples Test							
			Paired Differences				
			95%				
		Mean	Lower	Upper	T	Df	Sig 2
Student Learning Outcomes	Posttest Experiments	81.07	6.481	13.162	5.894	54	.000
	Posttest Control	71.25	6.480	13.163	5.894	53.323	.000

Based on the results of t-test analysis (t-test) on student mathematics learning outcomes can be seen in the table. From the table it is known that the calculated value is 5.894 with a significance of 0.000. The significance value shows 0.000 < 0,05 so Ho is rejected and H1 is accepted. This is also supported by the average score of the experimental class of 81.07 greater than the control class of 71.25. Based on Table 4, it can be concluded that there is an influence of interactive learning media on the mathematics learning achievement of grade VIII MTs Al-Azhaar um Suwanah students.

Table 5. Cohen's Effect Size Results

Effect Size	interpretation
1.49	Classified as large

Based on table 4 The average of the Post-Test Experiment class and the Control class are 81.07 and 71.25; The experimental posttest division standard was 6,577 while the control posttest division standard was 5,873. then by entering the formula Cohen got a result of 1.49.

To find out how much influence interactive learning media has on students' mathematics learning achievement in class VIII MTs Al-Azhaar um Suwanah can be known as follows:

$$ES = \frac{\bar{Y}_e - \bar{Y}_c}{S_c}$$

$$ES = \frac{81.07 - 71.25}{6.577}$$
$$ES = \frac{9.82}{6.577}$$
$$ES = 1,49$$

CONCLUSION

Based on the results of data and discussion of research conducted on the effect of the use of interactive learning media on the mathematical learning achievement of grade VIII students of Al Azhaar um Shuwanah 1, it was concluded that the calculated value was 5.894 with a significance of 0.000. A significance value that indicates 0.000. < 0,05 t_{table} = 2.005. The data requirements of variable X affect variable Y if t_{count} = 5.894 > t_{table} = 2.005. So Ho was rejected and H1 was accepted. So it can be concluded that the use of Interactive Learning Media affects the mathematical learning achievement of grade VIII MTs Al-Azhaar um Suwanah students.

SUGGESTION

The suggestions that can be given by researchers are as follows:
1. Teachers are expected to be able to use various interactive learning media in order to improve student learning outcomes which determine will affect students' mathematical learning achievement.
2. It is expected for students to be more active, focused and active in the teaching and learning process.
3. It is expected for schools to pay more attention to the activities of teachers and students in carrying out the teaching and learning process that takes place so that the planned learning objectives can be achieved properly.
4. The hope of researchers is that this thesis is useful later as a reference in the implementation of mathematics research and learning.

REFERENCES

Achdiyat, M. (2017) "*Visual-spatial intelligence, numerical ability, and mathematics learning achievement*"

Anwar, S. , Moh. B. A. (2020) *"Development of interactive learning media with visualization using Adobe Flash Professional on quadrilateral and triangular material to improve student achievement"*

Azzahra, A.N. (2023) *"Literature Review on Interactive Learning Media and Its Role in Islamic Religious Learning"*

Budi Dalam Musanna (2018) *"Basic Testing Criteria Using Joyfull Learning Strategy Assisted by Pop Up Book Media"*

Deni, F. 2017. *"Psychology of Learning. Yogyakarta : Student Library"*

Dewantara, H. (2020) In Nurlaela Saadah , Indra Budiman (2022) *"Meta Analysis: Development of Adobe Flash-Based Interactive Mathematics Learning Media at the Junior High School Level"*

Djamarah, 2012. *"Learning achievement and teacher competence. Surabaya : National Business"*

Djamarah, S. B, Azwan. Z. (2020:121), Asr (2011) *Understanding Learning Media*

Eka, E. et al. (2019). *"Improving Mathematics Learning Outcomes through the Problem Based Learning (Pbl) Learning Model for Grade 4 Sd. Journal of Mercumatics. Vol. 3 (2), 71-78"*

Fatihah, H. , Bakhri. (2013) *"Increasing Learning Achievement with Discovery Strategy in Science Teaching Subjects of Class V Students Mi Mubtadi'ul Ulum Kesamben Jombang"*

Gurudigital.Id (2018) *"Getting to Know Learning Media, Interactive Media, Types and Examples"*

Hakim, A. R., Husen, W. (2016) *"The Effect of Using Interactive Multimedia in Mathematics Learning to Improve Learning Outcomes of Elementary Students"*

Helmawati (2018), in Maulia Fitrah Alifa, (2022) *"The Effect of Self-Directed Learning and Mathematical Disposition on Mathematics Learning Achievement of State High School Students 9 Maros"*

Helmawati, 2018. *"Educating Outstanding Children through 10 Intelligences.Bandung: Pt Remaja Rosdakarya"*.

Hikmah, L. (2017). *"The influence of corporate social responsibility, service quality and marketing mix on corporate image in Baitul Maal wa Tamwil Pahlawan Tulungagung. Institutional Repository, Iain Tulung Agung"*

Iqromi, M. A , Moh, H. B. (2018) *"The Influence of Computer Media on Student Learning Achievement"*

Irawan (2013) *"Development of Microsoft Office Powerpoint Learning Media Describing Technical Drawing in Technical Drawing Subjects at Smk Muhammadiyah 1 Playen "*

Jalius, A.V. (2017) *"Improving the Cognitive Ability of Elementary School Students Using Joyfull Learning Strategies Assisted by Pop Up Book Media"*

Jamaludin (2020) *"The Effect of Using Offline Android Application-Based Learning Media on the History Learning Outcomes of Class X Students of Smaan 5 Banjarmasin"*

Kemendikbud.Go.Id *"Interactive Learning Multimedia Concept"*

Khamidah, N. (2019) "*Discovery Learning: Application in Science Learning Assisted by Interactive Digital Teaching Materials for Student Learning Achievement*"

Lidia, S. (2019). *Academic and non-academic learning achievements, theory and implementation. Malang : Cv Literasi Nusantara Abadi.*

Miarso "*Understanding Learning Media According to Experts*"

Muhibbin, S. 2015. *Psychology of Learning. Jakarta : Pt Raja Grafindo Persada.*

Munir (2013) "*Interactive Learning Multimedia Concept*"

Novitasari, D. (2021) "*The Effect of Using Interactive Media on Student Mathematics Learning Interests and Outcomes in Online Learning*"

Pijar.Info (2020) "*Interactive Learning Media and Reasons for Using Interactive Media*"

Riduwan (2010) Arikunto, (2010) in Deni Hardianto "*Paradigm of Behavioristic Theory in the Development of Multimedia Learning*"

Rikayanti, A (2018) "*The Effectiveness of Audio Visual Media on Student Learning Achievement in Class V Akidah Akhlak Subjects Mi Tarbiyatul Hasanah Bringin Batealit Jepara for the 2018/2019 Academic Year.*"

Rismayani, et al. (2019) "*The Influence of the Tri Hita Karana-Oriented Numbered Head Together Learning Model on PKN Learning Outcomes*"

Rizky, R. N. et al. "*The Effect of Using Interactive Learning Media on Mathematics Learning Outcomes of Grade III Students of State Elementary School 101 Pekanbaru*"

Rosyid, et al (2019), "*Learning and the factors that influence it. Jakarta: Rineka Cipta*"

Saluky (2016), Pujawan (2012), Putri Sibeua (2014) in Sri Wibowo (2020) "*Development of Interactive Learning Media and the Effectiveness of Web-Based Interactive Learning Media on Line and Angle Material of Class VII Junior High School*"

Situmorang (2016) "*Differences in students' understanding of mathematical concepts between the Tgt type cooperative learning model and the Problem Based Learning (PBL) learning model on the material of one variable linear equation class vii Smp Negeri 2 Percut Sei Tuan*"

Situmorang, Y. E. (2020) "*The Relationship Between Democratic Parenting and Learning Achievement in College Students*"

Slameto in Tasya Widiarsih (2013: 54-72), "*the effect of compulsory learning programs on the learning achievement of SMK class XI TKJ students*"

Sugiyono. (2012). *Educational Research Methods. Bandung:*Alfabeta

Sugiyono. (2018). *Business Research Methods. Bandung. Alphabeta.*

Sugiyono. *Quantitative, qualitative, and R&D research methods.*

Sugiyono. (2017). *Educational Research Statistics. Depok. Pt Raja Grafindo Persada*

Suhendri, Hartati, Supardi, in Psychologymania (2022) "*Understanding Mathematics Learning Achievement*"

Supardi. (2017). *Educational Research Statistics. Depok. Pt Raja Grafindo Persada*

Suryabrata, S. (2010). *Research Methodology. Jakarta: Rajawali Press.*

Teni, N. (2018) *"Development of Learning Media to Improve Student Learning Outcomes"*

Tho"In, (2017: 162). *"Improving Learning Outcomes Describing Community Economic Actors through the Inquiri Method for Class VIII A Semester 1 Students of Smp Negeri 7 Sukoharjo in 2017/2018"*

Tululi. i, s,pd, m,pd.(2021) *"various learning media and, for example, increase the spirit of student learning"*

Wahab (2015: 242). *Psychology of Learning. Jakarta : Pt Raja Grafindo Persada*

Wares, F. R. Dj, et al. (2021) *"The Effect of Using Interactive Learning Multimedia on Student Learning Outcomes in Class IX Ball Material at Smp Negeri 2 Gorontalo"*

Widiyanto, J. (2010) *Scientific Journal M-Progress Vol.11. No.1*

Yanti, et al. (2019). *"Interactive mathematics learning media in an effort to grow student character. Proceedings of Semnafis. North Lampung: Semnasfip"*

Yulianto, A. et al. (2020) *"The Influence of Role Playing Models on Student Confidence in Junior High School Mathematics Learning"*

Zaiful, R. M. et al (2019: 9) *"Learning Achievement. Malang : Cv. Literacy of the Archipelago"*