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Research Article

The influence of media implementation of Algebra Cartoon Books on the learning outcomes of class VII students at Junior High School Plus Darus Sholah Jember

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ABSTRACT

Learning media is anything that can convey and channel messages from sources in a planned manner so as to create a conducive learning environment where recipients can carry out the learning process efficiently and effectively. This research is aimed at finding out the effect of implementing algebra cartoon books on the learning outcomes of class VII students at SMP Plus Darus Sholah Jember in the 2023–2024 academic year. The method used is the quasi-experiment research method with a posttest-only control design research design. The population of this study was all in class VII of SMP Plus Dasrus Sholah Jember, for a total of 76. Meanwhile, the sample used was class VIIA, with a sample of 15 people from the experimental class and 15 people from class VIIB as the control class. The sample data collection technique was carried out by random sampling. This research process shows that the implementation of algebra cartoon book media on the learning outcomes of class VII students at SMP Plus Darus Sholah Jember was carried out by dividing class VII into two groups, namely the experimental class, which used algebra cartoon book media, and the control class, which used conventional learning methods. The data analysis technique used is the independent sample t-test. The results of the research show that the significance value (2-tailed) is 0.000, which is lower than the significance level of 0.05. Thus, it can be concluded that the null hypothesis (H0) is rejected and the alternative hypothesis (H1) is accepted. In simple terms, it can be stated that there is a positive influence from the use of the Algebra Cartoon Book on the learning outcomes of class VII students in the mathematics subject algebra material at SMP Plus Darus Sholah Jember.

Keywords: Instructional Media; Implementation; Learning Outcomes; Algebra Cartoon Book

1. INTRODUCTION

Education is a conscious effort and is designed to create an atmosphere in the teaching and learning process for students so that their potential strengths can develop actively to have the strength of religious spirituality, simplicity or self-control, personality, intelligence, good morals, and skills needed by themselves, society, the nation, and the state (Law No. 20 of 2003 concerning the National Education System). Motivation for students during the learning process is a very important component in achieving the educational goals mentioned previously. This is because students who are not motivated may not be able to carry out learning activities well. Everything that can attract a student's attention may not necessarily attract the attention of other students. Apart from acting as managers, mediators, administrators, demonstrators, and supervisors in the learning process, teachers also act as motivators.

Mathematics is one of the fields of study that must be studied at the Basic Education (SD/MI) level. Mathematics is a subject that has quite an important role because of its close application in everyday life. Mathematics is an important subject, it is the basis for critical, logical and creative thinking skills that must be developed from an early age (Amir, 2015). This subject is identical to the arrangement of numbers along with a series of formulas (Halim, 2009). So far, teachers have implemented the following sequence of mathematics learning: (1) explaining mathematics topics, (2) giving examples of mathematics topics that have just been explained, (3) asking students to solve problems similar to those examples, and (4) providing practice question. The questions given are usually quite different. Starting with similar questions with examples of how mathematical objects are used in everyday life.

Learning mathematics with this approach usually makes students bored, uninterested, and less creative. Apart from that, what is saddest is that their mathematics learning achievements are still less than satisfactory. Even though these

students are not weak students, they have been busy memorizing the mathematics material given by their teacher. The mathematical material can be facts, concepts, principles, or practices. Thus, students cannot think critically and are less prepared to face problems because they have to memorize too much. Mathematics is also an abstract subject, so it is not uncommon for mathematics to be considered a difficult or boring subject, and even parents complain about how confusing the subject is. This can happen because when presenting material in class, there are still some teachers, such as those who used to teach using the lecture method alone without being accompanied by other interesting learning methods and media, so that students become bored, sleepy, passive, and only take notes. In fact, just understanding mathematical concepts requires an interest in reading mathematics textbooks. So that it is easier for students to learn mathematics lessons in class, creative teachers are needed, teachers who can choose the right media, methods, and approaches to suit their students' conditions, so that the learning process is a quality, efficient, and attractive one that makes the process of learning fun. Therefore, good strategies are needed in the learning process, and one way that teachers can apply them is by using learning media (Fathurrohman, 2007).

Media is a supporting means in a process of teaching and learning activities to convey learning material with the aim of achieving the desired learning outcomes (Karmiani, 2018). In learning, one component that has a very important role is the media used in the learning (Putri & Dewi, 2020). The use of learning media can increase the efficiency and effectiveness of learning by stimulating the learning process, thereby having an impact on increasing students' understanding of the subject matter being taught (Hamzah, 2014). The use of learning media in the teaching and learning process can generate new desires and interests, generate motivation and stimulation of learning activities, and even have psychological influences on students (Purwanto, 2011). The use of learning media at the learning orientation stage will greatly help the effectiveness of the learning process and the delivery of messages and lessons at that time. Apart from arousing student motivation and interest. Learning media can also help students improve understanding, present data in an interesting way, facilitate data interpretation and condense information (Arsyad, 2004).

In classroom learning, teachers can use various learning media that can help the learning process run smoothly so that learning objectives can be achieved well. It is also important for teachers to pay attention to the choice of media type before using the media in classroom learning. Considering the development of education today, there are many types of learning media that can be used in the classroom, including visual media (sight), audio media (hearing), and audiovisual media, which each have advantages and disadvantages in their use (Munadi, 2008). For this reason, you need to choose it carefully and correctly so that it can be used properly. The current situation is that students do not like reading textbooks, especially books that have minimal pictures and lack interesting illustrations. Due to the nature of the presentation of the message, books tend to be informative and place more emphasis on presenting teaching material with a broad and general scope, so that the communication process takes place in one direction and the readers tend to be passive.

Visual-based media (images or parables) play a very important role in the learning process. Visuals can also foster student interest and provide a connection between the content of the lesson material and the real world. To be effective, visuals should be placed in a meaningful context, and students must interact with the visual (image) to ensure information processing occurs (Arsyad, 2004). By using visual media during classroom learning, teachers can increase students' interest in learning and help students understand the content of the material being studied.

Based on empirical conditions, it is known that the mathematics learning outcomes of most students are still unsatisfactory. There are still students who get scores below the KKM set by the school, namely 65. Based on the results of initial interviews with class VII mathematics teachers at Plus Darus Sholah Middle School (SMP) Jember, students' understanding of mathematics is still low. Students rarely pay attention when the teacher explains, and there are students who are busy talking to themselves during the learning process. This was explained as having an impact on students' low understanding. Apart from that, there are students who still think that mathematics lessons are very difficult and boring. This mathematics teacher at SMP Plus, Darus Sholah Jember, explained that there was a decline in students' interest in learning mathematics. In this case, the teacher innovates by applying learning media that are considered appropriate for overcoming the problems of class VII students, especially in the mathematics subject. In this case, the teacher uses the book Cartoon Algebra by Larry Gonick.

This Algebra Cartoon Book is a mathematics book packaged in a unique form. The material presented in this book starts with basic operations (addition, subtraction, multiplication, and division), the concept of equations and variables, and graphs and squares, all of which are explained in this book. Apart from that, this book also provides many examples and practice questions to measure children's ability to understand the material. This algebra cartoon book is equipped with colorful illustrations, so readers don't feel bored when learning to use this book. This algebra cartoon book is very suitable to be used as a solution to student problems.

The advantage of this medium compared to others is that the expressions visualized in the pictures in the Algebra Cartoon book will make the reader emotionally involved and motivate the reader to continue reading until the end. So the learning process with algebra cartoon books as a learning medium can increase students' interest in learning mathematics, which will have a good impact on their understanding of the material. So, if the algebra cartoon book media is used in mathematics learning in class, it is hoped that it can improve students' mathematics learning outcomes. Based on the background above, the researcher is interested in studying in more depth the implementation of Al Jabar cotton dust media in improving student learning outcomes in mathematics subjects at the Plus Darus Sholah Middle School (SMP) Jember

2. RESEARCH METHOD

This research method is a method used to ensure that research is carried out appropriately and achieves the desired objectives (Jakni, 2016). Educational research methods are scientific techniques for collecting reliable data with the aim of discovering, developing, and proving certain types of knowledge that can be used to understand, solve, and anticipate educational problems. There are various types of research, including survey, exposition, experiment, naturalistic, and research and development (Sugiyono, 2015).

In this research, not all variables and experimental conditions can be strictly regulated and controlled. Therefore, the research method used in this research is quasi-experimental research. The experimental design used is a posttest-only control design, which is characterized by two groups chosen randomly. The group that is given treatment is called the experimental group, and the group that is not given treatment is called the control group. Experimental research methods can be interpreted as research methods used to find the effect of certain treatments on others under controlled conditions. In this study, the researcher wanted to investigate the influence of the implementation of algebra cartoon book media on students' mathematics learning outcomes, especially in algebra material, by applying treatment conditions (using algebra cartoon book media in learning) to students and comparing the results with the learning results of the experimental group and the control group.

Population refers to a general domain that includes objects or subjects with special qualities and characteristics that have been determined by the researcher to be analyzed, and from there conclusions can be drawn (Sugiyono, 2015). The population in this study was class VII of SMP Plus Darus Sholah Jember, a total of 76 people. . A random technique using a lottery system was applied because each class was considered to have the same opportunity and ability to become an experimental group or a control group. In taking class samples through this lottery system, the two classes that appear are immediately taken as samples. After that, another lottery was carried out to determine one control group and one experimental group from the two classes. The experimental group was given algebraic cartoon book media, and the control group was given conventional learning.

The next test was tested on students in Class VII A and VII B of SMP Plus Darus Sholah Jember. The item validity test was carried out using the biserial correlation formula. After the validity test, reliability testing is carried out using a certain formula. From the results of calculating the validity of the test items, it was found that of the 5 questions tested, 3 were considered valid. After the instrument to be used has been tested, it is distributed to the experimental and control classes to measure student learning outcomes after receiving different treatments. After obtaining the score, proceed with hypothesis testing. Before carrying out hypothesis testing, the data obtained must meet the assumption test, which consists of:

1. Normality test for student learning outcomes in mathematics, using the Kolmogrov-Smirnov Test and Shapiro-Wilk Test statistical techniques. The data distribution normality test aims to ensure that the data obtained has a normal distribution, so that hypothesis testing can be carried out. Test the normality of data distribution using the Kolmogrov-Smirnov test and Shapiro-Wilk test statistics. Data is considered to have a normal distribution if the resulting significance value is greater than 0.05.
2. Test the homogeneity of variance for the two groups, using the F test. The homogeneity of variance test between groups is used to assess whether the variance in each group has the same value. The homogeneity test is also used to ensure that the differences that emerge in hypothesis testing really come from differences between groups. Test the homogeneity of variance between groups using the Levene Test statistic. Data is considered homogeneous if the resulting significance value is greater than 0.05.

3. RESULTS AND DISCUSSION

Media is anything that can stimulate the learning process in students. In learning activities, media can be defined as something that can carry information and knowledge in the interactions that take place between teachers and students. Media also carries messages and information that are easily understood by students (Anwar, 2011). Learning media is anything that can convey and channel messages from sources in a planned manner so as to create a conducive learning environment where recipients can carry out the learning process efficiently and effectively (Munadi, 2018). Learning media refers to various communication tools that are arranged in a planned manner to convey information from sources to students. This aims to create a conducive learning environment where recipients of information can carry out the learning process efficiently and effectively (Munir, 2012). In order to guide students in finding innovative solutions to various problems and challenges in school and everyday life, the alternative is to involve learning media (Azhari & Irfan, 2018).

Media is one thing that can be used to improve learning processes and activities. Because of the variety of media, each has different characteristics. For this reason, it is necessary to choose it carefully and precisely so that it can be used appropriately to obtain the intended learning outcomes. In this research, the influence of the implementation of Algebra Cartoon Book Media on improving the learning outcomes of class VII students at SMP Plus Darus Sholah Jember is explained as follows:

a. Before conducting the research, the researcher had made careful planning, including making a RPP (Learning Implementation Plan) and designing learning activities for the experimental class, which used algebraic cartoon books, and for the control class, which used conventional learning methods.

b. Prepare algebra cartoon books, prepare student worksheets to be used, and also prepare posttest questions to measure student learning outcomes.

c. The learning process carried out in the experimental class, namely using the algebra cartoon book as media, is that students are given the opportunity to read and understand the algebra cartoon book that has been distributed by the teacher to each student. The book contains pictures, illustrations, and text that explain material about basic operational concepts (addition, subtraction, multiplication, and division), concepts of equations and variables, and graphs and squares. The following is the form of an algebra cartoon book used by class VII students at SMP Plus Darus Sholah Jember:

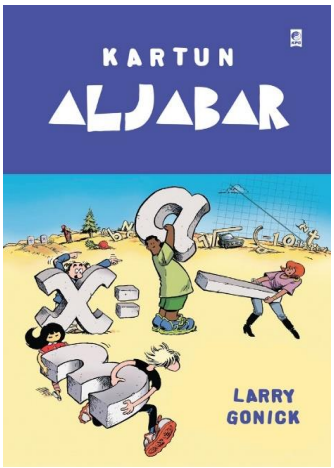

Figure 1. Algebra cartoon book

d. Meanwhile, the learning process carried out in the control class is conventional learning without using algebraic cartoon books.

As for the results of the learning implementation with the two groups, it was found that in the implementation of learning in the experimental class using algebra cartoon books by the teacher, this learning went well. Even though at first there were students who were still confused about using it, with guidance, approaches, and explanations from the teacher, students were able to use the media well. Using algebraic cartoon book media in learning can improve student learning outcomes through an attractive visual approach. Algebra cartoon books can help students understand mathematical concepts in a more fun and motivating way, thereby increasing their absorption of the subject matter. The implementation

of this medium can also stimulate students' creativity and strengthen their practical understanding of algebraic concepts. Algebra cartoon book media also helps teachers convey the material well and makes it easier for students to understand the information. This algebra cartoon book medium can also attract students' interest in learning with the unique pictures and designs contained in the book, so that student learning outcomes can also be maximized.

The algebra concept material presented in the form of an algebra cartoon book makes students interested in studying it well. Students understand the content of the algebra concept material well, so most students' learning outcomes tests can be done correctly because of the students' good understanding. The language of the images and text in the algebra cartoon book turns out to be able to quickly transfer understanding or information regarding a problem compared to writing alone. By having these elements in the algebra cartoon book, it can generate interest in students so that learning can be done optimally. This is proven by the learning results of students in the Experimental Group Mathematics subject using the Algebra Cartoon Book.

Table 1. Frequency Distribution of Mathematics Learning Outcomes Experimental Group and Control Group Students

No.	Experimental Class	Control Class
	Test Scores	Test Scores
1	80	65
2	75	70
3	72	72
4	84	65
5	90	60
6	80	64
7	78	62
8	78	70
9	82	62
10	86	66
11	90	62
12	86	60
13	75	65
14	70	60
15	72	62

Based on the Table 1, it can be concluded that the learning outcomes of students in the experimental class using algebra cartoon books were able to achieve the predetermined KKM scores. Meanwhile, the learning outcomes of students in the control class who did not use algebra cartoon books showed that there were students who still did not reach the specified KKM score. The following is the post-test average value, highest score, lowest score, and standard deviation in Table 2.

Table 2. Summary of Average Posttest Scores for Mathematics Learning Results Experimental Group and Control Group Students

Statistics	Post-Test Score	
	Experimental Class	Control Class
Average	79,86666667	64,33333333
Standard Deviation	6,423913657	3,829708431
Highest Score	90	72
Lowest Score	70	60

Based on the data in Table 2, it is known that the average post-test score for the experimental class is better than the control class (79.867 > 64.34). Based on the scores obtained, it is known that the post-test score for the experimental class

ranges from 70 to 90. Meanwhile, in the control class, the post-test scores ranged from 60 to 72. Judging from the standard deviation value, the experimental class had a standard deviation value that was greater than the control class (6.42 > 3.82). The difference in standard deviation values is not too different; there is only a difference of 2.46. This indicates that the distribution of data in the control class and the experimental class is not too different. In other words, the data variance in the two classes can be assumed to be homogeneous. Before carrying out an independent sample t-test to test the hypothesis, the data collected must meet several assumptions. These assumptions involve normality tests and homogeneity of variance tests between groups.

Table 3. Tests of Normality

Tests of Normality

	Class	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
learning outcomes	experimental class	.109	15	.200*	.953	15	.577
	control class	.195	15	.128	.892	15	.071

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

Based on the normality test results (**Table 3**), the data shows that the Kolmogorov-Smirnov and Shapiro-Wilk significance values for the experimental class are 0.200 and 0.577, respectively. Meanwhile, for the control class, respectively, it is 0.128 and 0.071. Because each significance value exceeds 0.05, it can be concluded that the data distribution for the two classes is considered to be normally distributed.

Table 4. Test of Homogenity of Variances Learning Outcomes

Levene Statistic	df1	df2	Sig.
4.200	1	28	.350

Furthermore, in the homogeneity test, a significance level value of 0.350 was obtained. Based on decision-making, if the significance value is > 0.05, then the data is homogeneous. Based on the results of the normality and homogeneity of variance tests, it can be concluded that the distribution of student learning outcomes data in basic electromechanical work subjects in the experimental group and control group is normal and has a homogeneous variance. Thus, hypothesis testing can be carried out using the independent sample t-test. All assumptions tested for the post-test value data have been met. The hypotheses to be tested in this research are as follows:

ANOVA

Learning Outcomes

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.809.633	1	1.809.633	64.707	.000
Within Groups	783.067	28	27.967		

In the linearity test, the researcher used the linearity test in the ANOVA table, where the experimental variables and control variables have no relationship due to the sign value. < 0.05. After the test is carried out, sign. The deviation from linearity is 0.000 < 0.05, so there is no relationship between the samples used, namely experimental samples and control samples. The t-test results are presented in the following table.

Table 5. Independent Samples Test

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Hasil Belajar	Equal variances assumed	4.200	.350	8.044	28	.000	1.553.333	193.103	1.157.779	1.948.888
	Equal variances not assumed			8.044	22.835	.000	1.553.333	193.103	1.153.709	1.952.957

Based on the information in the table above, the significance value (2-tailed) is 0.000, which is lower than the significance level of 0.05. Thus, it can be concluded that the null hypothesis (H0) is rejected and the alternative hypothesis (H1) is accepted. In simple terms, it can be stated that there is a positive influence from the use of the Algebra Cartoon Book on the learning outcomes of class VII students in the mathematics subject algebra material at SMP Plus Darus Sholah Jember.

The implementation of learning in the control class did not use algebra cartoon books. Instead, a mathematics textbook is held by each student and uses conventional learning methods where students only pay attention to the teacher's explanations. Learning in the control class took place normally; first, the teacher only explained the material that the students would study that day and gave several examples; then, the students' involvement in learning was limited to listening and writing instructions from the teacher. However, if there are still parts of the material that are not understood, students are allowed to ask the teacher. Learning in the control class tends to be passive, resulting in boredom among students. This is clearly in contrast to the learning conditions in the experimental class.

Based on the description above, it shows that the differences in learning media used in the experimental class and control class can produce different final results. The learning results of the experimental class, which was taught using cartoon algebra books in their learning, were different from the learning results of the control class, whose learning did not use algebra book media. Where the learning outcomes of control class students are lower than those of experimental class students. This is in line with what Hamalik stated by Azhar Arsyad in his book: that the use of learning media in the teaching and learning process can generate new desires and interests, generate motivation and stimulation of learning activities, as well as improve student learning outcomes and even have psychological influences on students (Arsyad, 2004). If students are enthusiastic about reading the lesson material, then the student's understanding of the material will also be higher, meaning that students' difficulties in studying and understanding the material will be reduced. This is proven by the average learning outcomes of experimental class students, which are better than the learning outcomes of control class students. In line with Junaidi's research results, which concluded that students' mathematics learning outcomes using visual media increased when compared to student learning outcomes without using visual media (Junaidi, 2008).

Comics are a visual medium and are also practical reading aids that teach students to read and help increase interest in the academic subjects involved. Reading comics helps children develop their imagination, increases interest in reading, and teaches students who don't like reading to read well (Negara, 2013). Like comics, the use of cartoon-based media can be used as a medium to help students interpret stories and information presented through a contextual approach. Based on research using comics as an educational source, it was concluded that comic media can motivate students, maintain attention, and improve student learning, especially for middle school students (Riskika, 2021). Additionally, cartoons or pictures have the potential to increase student enthusiasm, making it easier for them to remember instructions. This shows that students have a strong understanding of the learning process and that learning materials in cartoon form have a positive impact on the quality of learning.

The Algebra Cartoon Book is a visual communication medium and is not only a fun illustrated book but can also entertain those who read it. As a visual communication medium, this medium can be applied as an educational tool and is able to convey information effectively and efficiently to students. The main aim of using this medium during the learning process is to make it easier for students to understand a mathematical concept that they still consider complicated because this algebra cartoon book presents it in the form of images and sentences that are simple and easy to understand, making students more focused and concentrated during the learning process due to the presence of learning media. A part from that, algebra cartoon books as a learning medium will really help teachers in carrying out the learning process and help

students understand algebra concepts more easily so that students' mathematics learning outcomes will be better. Based on the data and description above, it can be concluded that there is an increase in learning outcomes from the implementation of algebra cartoon book media for class VII students at SMP Plus Darus Sholah Jember.

4. CONCLUSION

Based on the research results, the significance value (2-tailed) was 0.000, which is lower than the significance level of 0.05. Thus, it can be concluded that the null hypothesis (H0) is rejected and the alternative hypothesis (H1) is accepted. In simple terms, it can be stated that there is a positive influence from the use of the Algebra Cartoon Book on the learning outcomes of class VII students in the mathematics subject algebra material at SMP Plus Darus Sholah Jember.

ONFLICT OF INTEREST

There are no conflicts of interest declared by the authors.

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