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Research Article

The Effectiveness of The Utilization of Mathematical Pyramid Media on Academic Achievement of Students in Mathematics Education Study Program

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Abstract.

This study aims to see the effectiveness of the use of mathematical pyramid media in learning media courses to improve the academic achievement of fourth semester students of the Mathematics Education Study Program, FKIP UNA, Academic Year 2019/2020. The sample of this research is two classes, namely class IVA (experimental class) and class IVB (control class). The pretest mean value of the experimental class (64.82) with the highest value of 82 and the lowest score of 46, the pretest value of the control class (61.48) with the highest value of 78 with the lowest score of 42. From the pretest homogeneity test there was no difference in variance or the two samples homogeneous where Fcount <Ftable (1.86). From the pretest data normality test, it was obtained that L0 for the experimental class (0.1274) and L0 for the control class (0.117). For post-test data, it is obtained L0 for the experimental class (0.1587) and L0 for the control class (0.1082). The value of L0 is smaller than L table (0.161) so it can be concluded that the data is normally distributed. The average post-test score of the experimental class (87.9) with the highest score of 90 and the lowest score of 63, while for the control class the average post-test score (80.6) with the highest score of 90 and the lowest score of 54. = 2.11> ttabel = 2.01 which means that Ha is accepted.

Keywords: Mathematics pyramid media; academic achievement; learning media

1. Introduction

Education is one of civilization and prosperity is the key to be achieved. Through education there will be a learning process that will mature so that in the decision-making process about a problem faced is always accompanied by a sense of responsibility. Therefore the lecture process in higher education is a very important activity in improving the quality of education. Because with education it can give birth to generations of knowledgeable people, both formal and non-formal education.

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Science education is one of the sciences that plays an important role in the development of science and technology. Education is an educational tool and means needed to develop other branches of knowledge. Other sciences will not be able to run perfectly without the support of education that can develop reasoning power and high thinking power. In the instructional media course, this subject is viewed by students as a difficult subject to study, this is shown by the large number of students who have difficulty designing educational media. The difficulty of students in designing learning media can be caused by various things such as lack of creativity and lack of student imagination to create an attractive media, class management that is not programmed from the teacher and class conditions that are not possible. In addition, it can be seen from the learning strategy applied that it still follows the method that is generally monotonous, namely only providing material, media examples, and then assignments. This situation makes students bored. In addition, the role of the teacher looks dominant so that the understanding obtained by students is only limited to what is conveyed by the teacher.

The media in these activities serve as information stimulus presenters, attitudes are also to increase success in receiving information. The media also functions to regulate progress steps and to provide feedback on the teaching and learning process. By using learning media it does not seem boring to students, because students do not only listen to lectures but by using learning media students will be more interested in the lessons delivered and students will be motivated to learn and clarify and simplify abstract concepts and increase absorption or retention of learning. Therefore, it is hoped that the use of media can help the teaching and learning process which in turn can have a positive effect on student academic achievement in higher education[1].

The quality of learning is dynamic, relevant to the needs of society and graduate users, has an academic culture in the implementation of learning, there is a commitment to learning from teachers and students to improve the quality of learning and effective and efficient learning management, pay attention to program sustainability, efficiency and high access to information development. Quality learning will produce quality graduates as well, while to produce quality learning, creative graduates are needed in pursuing a professional learning process[2].

The learning media development program for students is one way that students can overcome the saturation of learning in the classroom, so that students are expected to have the competence in developing media that is in accordance with the changes and challenges of the times. According to [3] the word media comes from Latin, namely medius which literally means "Middle" introduction or intermediary. In this case the teacher, textbooks and school environment are Media. More specifically, the notion of

media in the teaching and learning process tends to be defined as graphic, photographic or electronic tools to capture, process and reconstruct visual or verbal information. Based on the above definition, it can be said that learning media is an intermediary tool in the learning process. In essence, the teaching and learning process is a communication process, the delivery of messages from the introduction to the recipient. In this interpretation, there are times when students succeed and sometimes they fail. Failure occurs when students are unable to understand what they hear, read, see, or observe[3]. The failure was caused by a disturbance that was a barrier to communication. Based on this, [1]the media must be useful as follows: (1) Clarifying the message so that it is not too verbalistic. (2) Overcoming the limitations of space, time, energy, and sensory power. (3) Generating passion for learning, direct interaction between students and learning resources. (4) Enable children to learn independently according to their visual, auditory, and kinesthetic talents and abilities. (5) Providing the same stimulation, equalizing experiences, and causing the same perception. (6) The learning process contains five communication components, namely teachers (communicators), learning materials, learning media, students (communicants), and learning objectives. So, learning media is anything that can be used to transmit messages (learning materials) so that it can stimulate student attention, interest, thoughts, and feelings in learning activities to achieve learning goals. (3) Generating passion for learning, direct interaction between students and learning resources. (4) Enable children to learn independently according to their visual, auditory, and kinesthetic talents and abilities. (5) Providing the same stimulation, equalizing experiences, and causing the same perception. (6) The learning process contains five communication components, namely teachers (communicators), learning materials, learning media, students (communicants), and learning objectives. So, learning media is anything that can be used to transmit messages (learning materials) so that it can stimulate student attention, interest, thoughts, and feelings in learning activities to achieve learning goals. (3) Generating passion for learning, direct interaction between students and learning resources. (4) Enable children to learn independently according to their visual, auditory, and kinesthetic talents and abilities. (5) Providing the same stimulation, equalizing experiences, and causing the same perception. (6) The learning process contains five communication components, namely teachers (communicators), learning materials, learning media, students (communicants), and learning objectives[4]. So, learning media is anything that can be used to transmit messages (learning materials) so that it can stimulate student attention, interest, thoughts, and feelings in learning activities to achieve learning goals. (4) Enable children to learn independently according to their visual, auditory, and kinesthetic talents and abilities. (5) Providing the same

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According to [3]states that media is a means of communication channels. The media can be considered as a learning medium if it carries messages in order to achieve learning objectives. At the beginning of the history of learning, the media was only a tool used by teachers to deliver lessons. Unlike today, the presence of learning media can also provide an emotional stimulus for students through mathematical pyramid media. The function of the media in these activities is to present information stimulus and attitudes to increase success in receiving information. The media also functions to regulate progress steps and to provide feedback on the teaching and learning process[6]. Using learning media does not seem boring to students, because students do not only listen to lectures from the teacher but by using learning media students will be more interested in the lessons delivered and students will be motivated to learn and clarify and facilitate abstract concepts. Therefore, it is hoped that the use of mathematical pyramid media can help the teaching and learning process which in turn can have a positive effect on students' academic abilities in algebra material.

2. Methods

This type of research is a quasi-experimental research, namely the effectiveness of using mathematical pyramid media on students' academic abilities with the scores and grades obtained by students after being givena test at the end of the experiment.

To obtain data on academic achievement, the researcher used data collection techniques in the form of a final test which was carried out at the end of the experiment which was taken from the National Exam questions on aljabar material. The test form is multiple choice. If correct, get a score of 1 and if wrong get a score of 0. Treatment of the experimental group and the control group.

TABLE 1: Research Procedure.

Experiment	T1	P1	T2
Control	T1	P2	T2

3. Results and Discussion

The results of the research in the experimental group and the control group came from the same initial conditions, namely after the normality and homogeneity tests were carried out which showed that the samples were normally distributed and there was no difference in variance. Then the two-mean similarity test was carried out which showed that the samples had the equivalent. The experimental group was given learning treatment using mathematical pyramid media while in the control group was given learning treatment without utilizing mathematical pyramid media.

After the treatment of the two classes is carried out the test is carried out, the test has been tested before in the trial class by testing the validity, reliability test, differentiation and difficulty level of the question items. The results obtained are that the test is reliable and the item meets the item validity.

Based on the data obtained, it can be seen that the average value of student academic achievement taught using learning by utilizing mathematical pyramid media in algebra (89,18) is higher than the average value of student mathematics academic achievement taught using learning models without using mathematical pyramid media, namely 78,37. The results showed that by utilizing the mathematical pyramid academic achievement of students of mathematics education study programs was effective. This is possibly influenced by: (1) By posing problems from students themselves, it will educate students to think critically. (2) By making student groups active in learning.

(3) Differences of opinion between students can be identified so that they are easily directed to healthy discussions. (4) Solving problems that students create themselves will teach students to analyze a problem. (5) presenting the results of the discussion to educate students to be more confident.

4. Conclusions

Based on the results of the study, it was found that the pretest mean score of the experimental class (64.82) with the highest value was 82 and the lowest score was 46, the pretest score for the control class (61.48) with the highest score was 78 with the lowest score 42. From the pretest homogeneity test there was no the difference in variance or the two homogeneous samples where Fcount <Ftable (1.87). From the pretest data normality test obtained L0 for the experimental class (0.1273) and L0 for the control class (0.118). For post-test data, it is obtained that L0 for the experimental class (0.1588) and L0 for the control class (0.1083). The value of L0 is smaller than Ltabel (0.162) so it can be concluded that the data is normally distributed. The post-test average score of the experimental class (87.9) with the highest score of 89 and the lowest score of 62, while for the control class the average post-test score (80.7) with the highest score of 88 and the lowest score of 52. From the t test, it was obtained t count = 2.11> t table = 2.01 which means Ha. accepted, namely the average academic achievement of students who are taught by utilizing mathematical pyramid media, which is more effective than the average student data being taught without utilizing mathematical pyramid media. From the results of data analysis carried out in this study, it can be concluded that learning by utilizing the mathematical pyramid media Ladder, students understand better in algebra material because students are more active in the learning process and can foster critical thinking, showing a higher average in the experimental class. while the average in the control class is lower.

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