ISSN: 3026-0442

Proceedings of the 2nd International Conference on Education, Science Technology and Health (2nd ICONESTH 2024 Universitas Bina Bangsa Getsempena, Sept 10-12, 2024, Banda Aceh, Indonesia

DIFFERENCES IN STUDENTS' PROBLEM SOLVING ABILITIES USING THE GALLERY WALK METHOD AND THE GEOGEBRA-BASED DEMONSTRATION METHOD ON THE ALGEBRAIC FUNCTION DERIVATIVES IN CLASS XII OF SMA NEGERI 1 BANDA ACEH

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ABSTRACT

The results of observations conducted at SMA Negeri 1 Banda Aceh, obtained that: 1) the problem-solving ability of students in solving mathematical problems is still low: 2) students have not been taught to use technology as a medium for learning mathematics, especially GeoGebra: 3) the learning methods used are still conventional. The formulation of the problem in this study are is there a difference in the problem-solving ability of students who use the Gallery Walk method and the demonstration method, both of which use Geogebra on the algebraic function derivatives in class XII F1 and XII F2 at SMA Negeri 1 Banda Aceh. This study aims to determine whether there is a difference in the problem-solving ability of students who use the Gallery Walk method and the demonstration method. This study is a quantitative study with an experimental method. The samples taken in this study were two classes, namely XII F1 as the experimental class and XII F2 as the control class. The instrument used in this study was a test (pretest-posttest). Based on the results of the analysis of test data two independent samples obtained t_{hitung} = 2, 068 and t_{tabel} = 1.998 at the level = 0.05, then the $t_{hitung} > t_{tabel}$ or 2.068 > 1.998, thus H_0 is rejected and H_a is accepted, which means there is a significant difference in the problem-solving abilities of students taught by the Gallery Walk method and those taught by the demonstration method on the material of algebraic derivative functions at SMA Negeri 1 Banda Aceh.

***Keywords**: problem solving skills, Gallery Walk, demonstration*

INTRODUCTION

The learning process is a relatively permanent change in behavioral potential as a result of experience or reinforced skills. One of the basic abilities that students must have is problem-solving skills (Muliani et al., 2021). There are four steps to solving problems that are presented alternately referring to Polya's theory, namely 1) interpreting a problem or issue, 2) designing solution stages, 3) realizing implementation, 4) reviewing (Sundayana, 2016).

In reality, the problem-solving abilities of students today are still relatively low, especially in mathematics learning (Muliani et al., 2021). Mathematics is one of the basic sciences that is widely used in various fields of life such as economics, industry, engineering, insurance and in many social and other fields.

To improve students' problem-solving skills, a teacher is required to be able to choose and use learning methods and media that are appropriate to the material taught to students. In this modern era, there has been a lot of use of ICT-based learning media, especially in mathematics learning (Vinsensia, 2022). According to Faradisa (2019), some mathematics materials require visualization which, if done manually, students have difficulty understanding them. According to Batubara (2020), one solution to improve problem-solving skills and many other problems such as students who are not actively involved in the learning process, do not understand the material, are lazy to take notes, do not do assignments, and lack of student intensity in asking questions is by using technology in learning such as GeoGebra Software.

Based on the results of observations conducted at SMAN 1 Banda Aceh, several problems and obstacles were found as follows: 1) the low problem-solving ability of students in solving mathematical problems that they have only learned through books without any visualization with the help of technology to easily understand the shape and appearance of the material being taught; 2) students have not been taught to use technology as a medium for learning mathematics, especially the Geogebra application; 3) the learning methods used are still conventional.

To overcome these problems, one of the ICT-based learning media that can be applied in mathematics learning is the GeoGebra software application. In addition to learning media that play an important role in improving student understanding, learning methods also have an effect on this and also for increase the active role of students. For this, various learning approaches can be used, one of which is the Gallery Walk method.

In addition to the Gallery Walk method, another learning method that can increase students' active role in the learning process is the demonstration method. The demonstration method is a way of delivering lessons by demonstrating or showing students a certain process, situation, or object being studied, either real or imitation objects, which are often accompanied by oral explanations (Rina, 2020).

Based on this background, the researcher is interested in conducting research related to "Differences in Students' Problem Solving Abilities Using the Gallery Walk Method and the GeoGebra-Based Demonstration Method on the Algebraic Functions Derivatives in Class XI of SMA Negeri 1 Banda Aceh"

METHODS

This research approach uses a quantitative approach with an experimental research method. The experimental research method is a research method used to find the effect of treatment (Arifin, 2020). According to Arikunto (2010), experimental research is a change caused by treatment carried out intentionally by researchers, with a two-group pretest-posttest design design, getting one experimental class that is given an initial test first, then given treatment and a final test is carried out, and one more class as a control class that is given an initial test, but is not given treatment, different from the experimental class. In order to get a conclusion, the treatment is carried out by comparing the results of the initial test and the results of the final test, then comparing the results of the final test of the experimental class with the control class and if it turns out that the results of the final test are better than the initial test then the final results of the experimental class are better than the control class, then the treatment carried out by the researcher is said to be successful.

RESULTS AND DISCUSSION

Based on the results of the analysis of research data proven through a series of statistical tests using the help of IBM SPSS software version 23, it is known that the Sig value> 0.05 in the normality test, meaning that the data taken is normally distributed. Then in the homogeneity test of the pretest value of the experimental class and the control class, Sig = 0.465 was obtained, with a comparison of the value a = 0.05, meaning Sig> a or 0.465 0.05, then the data is stated to come from a population with homogeneous variance.

Next, after knowing the students' learning outcomes, treatment was given by applying different learning methods to the algebraic derivative function material. In the experimental class, the Gallery Walk learning method was taught and in the control class, the demonstration method was

taught, in which both classes used the GeoGebra application as a learning medium in its application. Then after the treatment was given, a posttest was given at the end of the meeting to find out the students' final learning outcomes after the treatment was given.

In the posttest, it is known that the average value obtained by students from the experimental class using the Gallery Walk method is 76.7333, while the average posttest value obtained by the control class using the demonstration method is 70.5556. Then based on the homogeneity test that has been carried out on the posttest values of the experimental class and the control class, Sig = 0.189, with comparison of the value $\alpha = 0.05$, meaning Sig > α or 0.189 > 0.05, then the data is stated to come from a population with homogeneous variance.

Based on the average posttest score of the experimental class and the control class, it can be seen that the experimental class has a higher average score compared to the average score of the control class or 76.7333 > 70.5556. Furthermore, to prove whether there is a significant difference in students' problem-solving abilities, a t-test is used on the given hypothesis.

The results of the hypothesis testing obtained a value of $t_{hitung} = 2.068$ and $t_{tabel} = 1.998$ at the level of $\alpha = 0.05$, so $t_{hitung} > t_{tabel}$ or 2.068 > 1.998, thus H_0 is rejected and H_a is accepted, which means there is a significant difference in the problem-solving abilities of students taught using the Gallery Walk method and those taught using the demonstration method on the material of algebraic derivative functions at SMA Negeri 1 Banda Aceh.

CONCLUSION

Based on the research results that have been obtained, the conclusion that researchers can put forward in accordance with the objectives that have been formulated at the beginning and based on the results of the analysis with a series of statistical tests conducted is that there is a significant difference in problem-solving abilities and learning outcomes between the experimental class taught using the Gallery Walk method and the control class taught using the demonstration method on the material of algebraic function derivatives in class XII of SMA Negeri 1 Banda Aceh. This can be seen from the average value of the experimental class which is higher than the control class and also the results of the t-test which states that there is a significant difference in students' problem-solving abilities between the two classes.

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