

THE INFLUENCE OF THE GEOGEBRA-ASSISTED *THINK PAIR SHARE* TYPE LEARNING MODEL ON THE CONCEPT OF MATHEMATICAL UNDERSTANDING AND STUDENT LEARNING MOTIVATION

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ABSTRACT

This study aims to determine the effect of the Geogebra-assisted *Think Pair Share type cooperative learning model* on the understanding of mathematical concepts and student learning motivation. The data collection technique uses 5 essays on the ability to understand mathematical concepts and learning motivation questionnaires—data analysis with Data Normality Test, Data Homogeneity, t-Test, and Likert Scale Test. The results of (1) paired sample t-test tests in the experimental and control classes each obtained a calculated value $< t_{table}$ so that H_0 was rejected and H_1 was accepted. (2) Independent test t-test samples in experimental class and control class obtain $t_{calculate}$ values $> t_{table}$ so that H_0 is accepted and H_1 is rejected. Moreover, (3) the results of student motivation questionnaires were obtained on average by 78% with solid criteria.

Keywords: Think Pair Share *learning model*, Geogebra, Understanding mathematical concepts, student learning motivation.

INTRODUCTION

Mathematics is a science studied from elementary school (SD) to college, including in High School (SMA) or Vocational High School (SMK). However, many still find this subject difficult. Mathematics is a symbolic language that symbolizes a series of meanings from conveyed statements. Basically, mathematics is a formless science and that is what causes mathematics to be considered difficult because it is not real. Thus, it can produce new ideas that are useful for the interests of technology that has an essential role in improving human life. Based on Jerome Brunner in the book Suherman (2002, 44) in cognitive psychological theory states that learning mathematics will be more successful if the teaching process is directed to the concepts and structures contained in the discussion taught, in addition to the related relationships between concepts and structures.

The ability to understand mathematics is included in one of the essential parts of mathematics learning activities at school.

The ability to understand mathematics itself is the ability to absorb and understand ideas in mathematics learning. Understanding of concepts, mechanical, rational, inductive, intuitive, instrumental, and relational are aspects of mathematical comprehension ability (Lestari and Yudhanegara, 2015). As Cockcroft (1982) said above that students' mathematical comprehension abilities vary, understanding a concept that several students can understand in one lesson may take days or even weeks for other students. This means there is a huge difference in achievement between students of the same age. Because there are differences in abilities, there are differences in the mastery of students' mathematical abilities in school. The success of students to be able to improve their mathematical comprehension skills in understanding mathematics lessons is a joint effort because there are 6 principles for school mathematics, two of which are Teaching and Learning. Teaching practical maths material will require an understanding of what students know and need to learn and then challenge students

and support them to learn it well. The mathematics teaching that students get from school can shape their understanding of mathematics, form the ability to solve problems and form confidence in mathematics learning (NCTM, 2000).

According to Sardiman (2011), motivation takes an essential role in the generation of passion, pleasure and enthusiasm of students to learn. The desire of students to learn cannot be separated from their learning motivation. The high motivation of students may help encourage students' commitment to constantly learn and continue to try to understand the learning they get at school. The teacher's role is to foster learning motivation in each student in order to create meaningful learning. High and low motivation owned by students can have an influence that turns out to be different on students' mathematical understanding ability (Nitami et al., 2017).

Based on observations and interviews with teachers and students at SMK Pasundan 1 Serang City in class XI. It was found that students still consider mathematics subjects to be complex subjects. This statement is reinforced by students that mathematics has many symbols, collections of numbers, and calculation operations that must be understood and concentrated in the process. Then the low motivation to learn can be seen from the lack of conducive learning process, this can be seen when the teaching and learning process is in progress there are still students in and out of the classroom and there are some noisy students on the back benches. Student curiosity is still relatively low when the teacher explains the learning material, as a result when given assignments there are still students who are confused and finally cheated, there were even some students who did not do assignments. This indicates that there are still quite a lot of students who are less motivated in learning. In mathematics learning, there are many software available that are designed specifically for mathematics learning such as Geometers Sketchpad, Cabri, Maple,

Derive, Autograph and so on. However, the software is commercial software so it is not accessible to be used by mathematics teachers in Indonesia. Geogebra is one of the most sophisticated mathematics learning application programs, supports a variety of mathematics topics and is available for free. Geogebra can be used as a teaching aid to demonstrate mathematical concepts because of the availability of representations of mathematical objects in the form of algebra, geometry and worksheets. Geogebra can also be used as a learning medium by visualizing abstract mathematical concepts into natural forms and easily understood by students. Therefore, in this study, the Geogebra program will be used which will be combined with a learning model *Think Pair Share*.

METHODS

This class action research was carried out at SMK Pasundan 1 Serang City. This place is determined or chosen because researchers have taught in this school so that it will facilitate the implementation of research. While the setting is set on class XI OTKP students who are part of children who have low motivation.

This research was conducted in the odd semester of the 2023/2024 academic year which lasted for approximately 1 month starting from July 17, 2023 to August 9, 2023.

Data collection techniques are a way to obtain the information we want to get. Data collection is a systematic procedure to obtain the required data. In terms of how data collection techniques are used, data collection can be done with questionnaires (questionnaires) and tests. Data collection techniques in this study are:

The data collection technique used by these researchers is a test. According to Supardi (Fitriana, 2018) tests are instruments (questions, exercises, tools) to measure the level of knowledge, ability, intelligence, or talent possessed by individuals/groups

Questionnaires are a number of statements

made based on indicators studied and given to students who are the subject of research (Sabanna, 2018). The questionnaire in this study was used to obtain information about student learning motivation.

RESULTS AND DISCUSSION

1. Paired Test Sample t-test

The paired sample t-test test was carried out on experimental class pretest and posttest data using a type cooperative learning model *think pair share* Geogebra-assisted. This test is used to determine differences in students' ability to understand mathematical concepts before being treated with learning models *think pair share* and conventional models and after being treated with learning models *think pair share* and conventional models. Here are the paired sample t-test results:

Class	Sig. (2-tailed)	Information
Pretest-posttest	.000	H0 rejected

Based on the table above, the sig value is obtained. (2-tailed) of $0.000 < 0.05$ so H_0 is rejected and H_1 is accepted. Because H_0 is rejected and H_1 is accepted, it can be concluded that there is an average difference between pretest-posttest learning outcomes. There is an influence of use in the ability to understand mathematical concepts of students.

2. Independent Test Sample t-test (t-test)

The similarity test of the two *posttest-posttest* averages is used as an *independent sample test T-test equal variance assumed* with the following results:

Class	Sig. (2-tailed)
Posttest-posttest	.001

Based on the results of the independent test output of the T-test sample *Aqual variance assumed* Obtained GIS (2-tailed) values of $0.001 < 0.05$, it can be concluded that there is a difference in the average learning outcomes of students *posttest* Experimental class with *posttest* Control class.

CONCLUSION

The results of research at SMK Pasundan 1 Serang City in class XI OTKP adhered to the learning model *Think Pair Share* Geogebra's assistance to the ability to understand mathematical concepts of students obtained the following conclusions:

- 1) There are differences in students' ability to understand mathematical concepts after learning in experimental classes and control classes.
- 2) There are differences in the ability to understand mathematical concepts of students who use the *Geogebra-assisted* Think Pair Share learning model with conventional learning models.
- 3) There is a criterion for the percentage of learning motivation questionnaire results with the most significant percentage of 78%, while the smallest percentage is 75%.

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