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The Influence of the Think Pair Share (TPS) Learning Model on Ability Solving Mathematical Problems for Class XI Students at Muhammadiyah 18 School

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A B S T R A C T

The aim of this research is to find out whether the Think Pair Share (TPS) learning mode has an effect on the mathematical problem solving abilities of Grade XI class students at Muhammadiyah 18 school. The method used in this research is a quantitative one group pretest-posttest design method. The results of the instrument test analysis showed that the instrument was valid and reliable, in addition, from the results of the data analysis calculations it was found that the sample had a normal distribution. The hypothesis of this research is that there is an influence of the Think Pair Share (TPS) learning mode on the mathematical problem solving abilities of Grade XI class students at Muhammadiyah 18 school. Based on the results of calculations using the t test, it can be concluded that the hypothesis is accepted, namely t_count is 2.083, which is greater than t_tabe, namely 2.008. The research results can be useful for related parties such as teachers, students and future researchers.

INTRODUCTION

Education is the most important thing in human life, which means that every human being has the right to get it and is expected to always develop in it, because education in general has the meaning of a life process in developing each individual to be able to live and live life. National Education System NO. 20 of 2003 says that education is a conscious effort planned to create a learning atmosphere and learning process so that students actively develop their potential to have religious spiritual strength, self-control, personality, intelligence, good morals and skills. That is needed by himself, society, nation and state (Sulianto et al., 2019). In simple and general understanding of the meaning of education as a human effort to grow and develop the potential of both physical and spiritual traits in accordance with the values and norms that exist in society (HR Kurniawan et al., 2018).

Think Pair Share (TPS) is a form of cooperative learning model designed to improve student interaction patterns so that it can foster student enthusiasm for learning. The Think Pair Share method begins with a classical presentation of the material, then problems are given to students who work together in pairs (think-pairs), then students do a group presentation (share).

Given the importance of mathematics, it is in the curriculum Based on the type of mathematical ability, it can be classified into five main competencies (Hendriana, et al. 2016), namely: 1) Mathematical understanding; 2) Problem solving

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(mathematical problem solving); 3) Mathematical communication (Mathematical communication); 4) Mathematical connection; 5) obtain the knowledge given by the teacher, but also involves various learning about Mathematics is a study material that has abstract and constructed objects mathematics, solving modes and interpreting the solutions obtained. And can communicate ideas with symbols, tables, diagrams, or other media to clarify situations or problems (Amaliyah et al., 2019). knowledge, attitudes and skills that students have to achieve learning outcomes Mathematical reasoning (mathematical reasoning).

In general, so far mathematics teaching has focused more on the algorithmic aspects of computing, it is not surprising that based on various studies it shows that students can generally carry out various mathematical calculations, but do not show encouraging results regarding their application in everyday life (Lestari et al. ., 2020). Mathematics in schools, mathematics is also a vehicle for interaction between students and also as a means of communication between teachers and students.

One of the government's efforts for this educational goal is to develop a curriculum and to achieve this, a new paradigm is needed by a teacher towards a different treatment of knowledge, which is usually teacher-centred learning which will change into innovative and student-centred learning (Kamil et al. al., 2021).

Based on the description above, it shows that a high level of ability in through a deductive reasoning process, namely the truth of a concept is obtained from the consequences Mathematics such as mathematical problem solving is very important to develop and owned by students through mathematics learning at school. Learning is basically the addition of new information and abilities that are given by the teacher and must be possessed by students, so students are not only expected to be able to understand the mathematical material that is being taught. concepts in mathematics are very strong and clear (D. Kurniawan et al., 2020a). The aim of mathematics is for students to have the following abilities, namely solving problems which includes the ability to understand problems, design fashion taught, but students are expected to have useful mathematical abilities to face global challenges and be able to make decisions in everyday life (Satria, 2021). According to Harefa, D (2020) the process of learning activities carried out in schools is a complicated process because it is not just (Mathematical communication); 4) Mathematical connection; 5) obtain the knowledge given by the teacher, but also involves various learning about Mathematics is a study material that has abstract and constructed objects mathematics, solving modes and interpreting the solutions obtained. And can communicate ideas with symbols, tables, diagrams, or other media to clarify situations or problems (Amaliyah et al., 2019). knowledge, attitudes and skills that students have to achieve learning outcomes good.

Mathematics is a study material that has abstract and constructed objects through a deductive reasoning process, namely the truth of a concept is obtained from the consequences Mathematics such as mathematical problem solving is very important to develop logically from the truth of a concept, previously accepted, so that the relationship between concepts in mathematics are very strong and clear (D. Kurniawan et al., 2020a). The aim of mathematics is for students to have the following abilities, namely solving problems which includes the ability to understand problems, design fashion mathematics, solving modes and interpreting the solutions obtained. And can communicate ideas with symbols, tables, diagrams, or other media to clarify situations or problems (Amaliyah et al., 2019).

The low ability to solve students' mathematical problems also occurred at Muhammadiyah 18 Sunggal School where the researcher carried out observation activities on May 17 2023. Based on the results of observations by the researcher and interviews with one Muhammadiyah 18 Sunggal through the following questions: diagrams, graphs) or everyday problems and solve them, where 12 students fulfilled it and 16 students did not fulfill it (Nainggolan et al., 2022). Question number 2 with a percentage gain of 21.4% for indicators (3) Selecting and creating a mathematical mode (image, Based on the answers of 28 students, according to the researchers, there was a score gain on students' mathematical problem solving abilities, for question number 1 with a score of One mathematics subject teacher at the Muhammadiyah 18 Sunggal School, the researcher received information that mathematics teaching carried out in schools was not yet fully able to develop students' mathematical abilities such as mathematical problem solving abilities (Suryani, 2018).

SITUATION ANALYSIS

Mathematics teaching generally still takes place in a traditional way with teacher-centred characteristics, using an expository approach so that the teacher dominates the learning activity process in the classroom while the students are passive, in addition the exercises given are more routine questions so that they are less equipped to use reasoning power. students' problem solving and thinking abilities are only at a low level. Conditions in schools, mathematics teachers pay

little attention to increasing student activity in learning (Rahmawati & Hanipah, 2018). Very students Rarely asks the teacher questions so the teacher is busy explaining what is happening has been prepared, and students just accept what the teacher says. So learning tends to be one-way, there is more teacher learning activity than interaction between students. This means that learning tends to be teacher-centered.

Students are also less trained in creating mathematical modes of problems given by the teacher in answering questions asked by the teacher, can be seen when students are given questions related to the Two Variable Linear Program material. (Ramadhani, 2017). Students' difficulties in the Two Variable Linear Program matrix can be seen based on the results of observation tests given by researchers to students at Muhammadiyah 18 Sunggal schools. The low ability to solve students' mathematical problems also occurred at Muhammadiyah 18 Sunggal School where the researcher carried out observation activities on May 17 2023. Based on the results of observations by the researcher and interviews with one Muhammadiyah 18 Sunggal through the following questions:

Based on the answers of 28 students, according to the researchers, there was a score gain on students' mathematical problem solving abilities, for question number 1 with a score of percentage score of 42.8% for indicator (2) Create mathematical mode (pictures, tables, diagrams, graphs) or everyday problems and solve them, where 12 students fulfilled it and 16 students did not fulfill it (Nainggolan et al., 2022). Question number 2 with a percentage gain of 21.4% for indicators (3) Selecting and creating a mathematical mode (image, graphs, diagrams, tables), as well as finding solutions, where 6 students fulfilled and 22 students centered). Students are also less trained in creating mathematical modes of problems does not meet the. Question number 3 with a percentage gain of 28.5% for indicator (1) identify real objects, analyze everyday situations and events in the form of mathematical modes (pictures, tables, diagrams, graphs), where 8 students fulfill and 20 does not meet. Percentage of students' mathematical problem solving abilities overall it is 35.7%, so it can be concluded that problem solving student. The learning process at school does not only focus on quantity but also quality measure the extent to which students have mastered the material taught by the teacher, especially in necessity (MARSELLA et al., 2020). The role of a teacher at school is to develop each student's abilities and talents so that there is challenging and complex learning. Therefore, problem solving skills are very important for at the school is still low.

To overcome this problem, there are many things that must be considered in teaching in education, especially the characteristics of the material, the characteristics of each student because this is the responsibility of a teacher, and the teacher's ability to carry out the learning (Shoimin, A, 2019). This condition must be improved in accordance with advances in knowledge so that students can choose their thinking abilities. Therefore, good teaching and learning methods and strong cooperation between teachers and students are needed so that mathematics learning objectives are achieved and can increase students' mathematics learning knowledge (Sidabutar, 2018).

In teaching mathematics, a learning mode is needed that attracts students' attention and can change a boring, hard atmosphere into a more exciting atmosphere. By changing the learning mode, mathematics learning can be meaningful and memorable for students (Editia, 2020). This problem requires innovation in learning, where the teacher mathematics lessons. The use of the Think Pair Share (TPS) learning mode or think in pairs is a variety of types of cooperative learning designed to influence has an important role in providing learning modes that can improve students' mathematical problem solving abilities. Problem solving is an important part of mathematics learning. problem solving, can build a student's confidence in solving mathematical problems, capable an effective way to create variations in the atmosphere of cool discussion patterns. Think Pair Share (TPS) is a cooperative learning mode which consists of 3 stages, namely thinking, pairing, and sharing. Teachers are no longer the only source of learning (teacher oriented), but instead students are required to be able to discover and understand the concepts improve decision making in daily life.

In the learning process, the choice of learning mode must be in accordance with the material being taught and produce optimal learning that is easily understood by students. overall it is 35.7%, so it can be concluded that problem solving student. The learning process at school does not only focus on quantity but also quality measure the extent to which students have mastered the material taught by the teacher, especially in necessity (MARSELLA et al., 2020). The role of a teacher at school is to develop each student's abilities and talents so that there is challenging and complex learning. Therefore, problem solving skills are very important for achieved by students at school, because problem solving abilities are a tool for measure the extent to which students have mastered the material taught by the teacher, especially in mathematics lessons. The use of the Think Pair Share (TPS) learning mode or think in pairs is a variety of types of cooperative learning designed to influence has an important role in providing learning modes that can improve students' mathematical problem solving abilities. Problem solving is an important part of mathematics learning problem solving,

can build student interaction patterns (Imas K and Berlin Sani, 2016). Basically, this mode is a an effective way to create variations in the atmosphere of cool discussion patterns. Think Pair Share (TPS) is a cooperative learning mode which consists of 3 stages, namely thinking, pairing, and sharing. Teachers are no longer the only source of learning (teacher oriented), but instead students are required to be able to discover and understand the concepts new concept. Assuming that all recitations or discussions require organization to control overall performance, and the procedures used in Think Pair Share can give students more time to think, to respond and help each other. This research was motivated by students' lack of mathematical problem solving abilities. This is partly influenced by the learning mode used. The learning mode that can help students in solving problems is the Think Pair Share (TPS) type cooperative learning mode (WATI, 2019).

Based on the description above, with this learning mode, students tend to actively participate in learning at Keas because all students are directly involved. Think Pair Share (TPS) can improve students' ability to remember information and a student can also learn from other students and convey their ideas to each other for discussion before presenting them in front of the class. So researchers are interested in using the Think Pair Share learning mode (D. Kurniawan et al., 2020b). This is what led the researchers to carry out research entitled "The Influence of Fashion." Think Pair Share (TPS) Learning on Mathematical Problem Solving Ability.

IMPLEMENTATION METHOD

This type of research is quantitative research. According to Sugiyono, 2017, research Think Pair Share (TPS) and is called the test of experimentation. Groups cannot be selected and placed randomly. Experimental students will initially be given mathematical problem solving abilities (pretest) then given treatment and finally given (posttest) Quantitative is research data in the form of numbers and analysis using statistics. According to Yusuf, M, 2017, quantitative research looks at predictable human behavior and social reality, objects, and can be measured. Use of research quantitative with instruments that can be valid and reliable as well as appropriate statistical analysis and new concept. Assuming that all recitations or discussions require organization to control overall performance, and the procedures used in Think Pair Share can give students more time to think, to respond and help each other. This research was motivated by students' lack of mathematical problem solving abilities. This is partly influenced by the learning mode used. The learning mode that can help students in solving problems is the Think Pair Share (TPS) type cooperative learning mode (WATI, 2019). appropriate so that the research results achieved do not deviate from the actual conditions (Wakijo & Puri, 2019).

This research is a type of experimental research with a Pre-Experimental form The designs used are one group pretest-posttest designs. In design There is a pretest, before being given treatment. In this way the results of the treatment can be achieved is known to be more accurate, because it can be compared with the situation before treatment (Sugiyono, 2018).

In the research plan, the treatment will be in the form of a learning mode Think Pair Share (TPS) and is called the test of experimentation. Groups cannot be selected and placed randomly. Experimental students will initially be given mathematical problem solving abilities (pretest) then given treatment and finally given (posttest) implementing the Think Pair Share (TPS) learning mode. Then the hardness will be measured A research instrument is a tool used to measure observed natural and social phenomena (Sugiyono 2019). This research instrument functions for. In this research, it is divided into an initial test (pre-test) and a final test (post-test). Obtain data that meets established data standards. Therefore, this stage cannot be mistaken and must be carried out carefully according to the procedure. Therefore facilitate research accomplishments. based on the difference between initial and final treatment (Rosdi, 2020).

This research was carried out at Muhammadiyah 18 Sunggal SCHOOL located at Jalan Sei Mencirim Sunggal, North Sumatra. This research was carried out in the odd semester of the new academic year 2023/2024. Population is a generalization area consisting of objects/subjects that have certain qualities and characteristics determined by researchers to be studied and then drawn conclusions Sugiyono (2017). The population in this research is the entire class from class XI.

A research instrument is a tool used to measure observed natural and social phenomena (Sugiyono 2019). This research instrument functions for facilitate research accomplishments. The research instrument used in this research is the test. The test type instrument involves a pre-test and post-test which includes a test of students' mathematical problem solving abilities in the form of essay questions. Mathematical problem solving ability test. In this research, it is divided into an

initial test (pre-test) and a final test (post-test). 5 questions related to the learning material. To determine the changes and influence on the performance of the experiment after the researchers carried out the treatment.

To obtain accurate data in this research, this research uses several data collection techniques as follows:

1. Observation
   Observation is a data collection technique that has specific characteristics compared to other techniques, namely interviews and questionnaires (Sugiyono, 2017). In this research, observations were made of the research subjects. Observations are carried out by researchers to systematically observe and record what will be observed, when and where.
2. Test
   Data collection through test techniques is carried out by providing a test instrument consisting of several questions to obtain data regarding students' abilities in cognitive aspects. In this research, researchers gave tests in the form of pretests and posttests on the ability to solve mathematical problems in the form of descriptions.
   The purpose of giving this test is to determine students' mathematical problem solving abilities and answer the research hypothesis that has been formulated previously. The questions are created based on indicators of mathematical problem solving abilities.
3. Documentation
   Documentation is a method used to provide accurate evidence. This documentation method aims to collect research data related to this research problem.
   As a result of data collection, a number of data were obtained that will provide answers to research problems. In data processing, hypothesis testing is carried out first, the data analysis requirements are tested, in this case the normality test is calculated and data homogeneity test. The level of mathematical problem solving ability is analyzed through pretest and posttest data obtained from the test results, from the test results a comparative hypothesis test was carried out, in this case the researcher used the t test.

RESULTS AND DISCUSSION

This research was carried out at the Muhammadiyah 18 Sunggal School whose address is Sei Mencirim Sunggal, North Sumatra. Population documentation is a method used to provide accurate evidence. This documentation method aims to collect research data. In this research, all of class XI, totaling 120 students, consisting of 8 class, and The participants in this research were students of class XI TBSM 1 consisting of 26 students as experimental class. The research applies this mathematics learning by using the Think Pair Share (TPS) learning mode for solving abilities students' mathematical problems. Researchers conducted research at the Muhammadiyah 18 Sunggal School to determine the lack of mathematical problem solving abilities of students in class XII, which where researchers will look at the influence of the class XI students' mathematical problem solving abilities.

This research was carried out at Muhammadiyah 18 Sunggal School in class XI TBSM 1 where researchers will look at the influence of the Think Pair Share (TPS) learning mode on as an experimental set with a total of 26 students, which were in the research. The researchers carried out this skill with an initial test (Pretest) and a final test (posttest). Based on the table of pretest posttest experimental test results above, it shows that the number of experimental skills was 26 students. The total number of average results of experimental tests for the pretest score of 464 and posttest 2228 after being given the Think Pair learning mode Share (TPS).

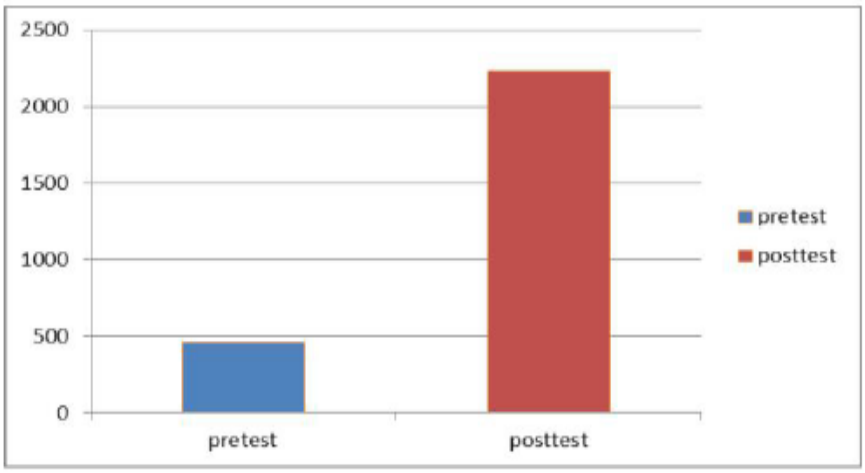


Figure 1. Histogram of Pretest and Posttest Results for Experimental Activities

The normality test is carried out to find out whether the research data is normally distributed or not. The normality test is carried out using a formula Kolmogorof Smirnov. The basis for decision making is if the significance value is > 0.05 then the value is normally distributed, if the significance value is < 0.05, then the value is not normally distributed.

Table 1. Tests of Normality

Class	Kolmogorov-Smirnova		
	Statistic	**df**	**Sig.**
Pretest Eksperimen	.154	26	.113
Posttest Eksperimen	.125	26	.200*

Based on the description in table 4.9 above, for experimental performance, the significance value of the pretest results (sig) is 0.113 and for the test of normality above, for experimental performance, the significance value of the posttest results (sig) is 0.200. So it can be concluded that the normality test for the experimental hardness value obtained a significance result of > 0.05, so the normality test has a normal distribution.

Hypothesis Testing

After the normality test was carried out, data hypothesis testing was carried out. Testing Hypothetical data serves to determine the influence of learning modes Think Pair Share (TPS) on the mathematical problem solving abilities of Keas XI students. Hypothesis tester carried out in this research was the t test.

Table 2. Hypothesis Testing

	Mean	N	Std. Deviation	Std. Error Mean
Postest Eksperimen	85.69	26	11.436	2.243
Pretset Eksperimen	17.85	26	6.323	1.240

Based on the table above, the amount of data on problem solving abilities is known mathematics for experimental skills as many as 26 students and the average value of the ability results problem solving (mean) for posttest the experimental strength is 85.69.

Based on the table above, the sig is 0.047 < 0.05, so there is a significant influence. The results of the analysis of the paired sample test show that t_count > t_tabe where t_count is 2.083, while t_count with a df level of 50 with t_count is 2.008 with a significance level of 0.05. So we get 2.083 > 2.008, which means that there is an influence of the Think Pair Share (TPS) learning mode on the mathematical problem solving abilities of Keas XI students at GKPS 2 Private Vocational School Pematang Siantar. So it can be concluded that H_a is accepted and H_0 is rejected.

CONCLUSIONS AND RECOMMENDATIONS

Based on the results of research and discussion, it can be concluded that the results of the study relevant research that has been selected based on predetermined criteria and class experiment significance value of pretest results from Kolmogorov-smirnov (sig) 0.113 for has been calculated. From the title The Influence of the Think Pair Share (TPS) Learning Mode on Mathematical Problem Solving Ability of class XI Students at Muhammadiyah 18 Sunggal School influences students' mathematical problem solving abilities, so Think Pair Share (TPS) learning mode is very suitable for use in this lesson. This can be seen from the t hypothesis test which shows that the significance value obtained is 0.000, which is smaller than the significance of 0.05 and the learning process using the Think Pair Share (TPS) learning mode makes students not easily bored, students are more active in discussing and asking questions to the group.

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