The Application Of the Think-Pair-Share Learning model To The Study Of Algebraic Fractions In Mathematics

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Abstract*. The objective of this study is to assess the impact of the Think-Pair-Share (TPS) cooperative learning model on the mathematical development of students. This method of investigation is quasi-experimental. This study included students from both seventh grades at SMP Negeri 4 Tabukan Utara. The data was obtained from a test designed to assess understanding of Algebraic Fractions. Class analysis results for the Think Pair Share Cooperative learning model class and the direct learning model class indicate that the average learning outcomes of students taught utilizing the Think Pair Share Cooperative learning model are greater than those of students taught utilizing the direct learning model.*

Keywords*: Cooperative Model, Think Pair Share, Learning Mathematics, Fractions*

Abstrak. *Tujuan penelitian ini adalah untuk mengevaluasi keefektifan model pembelajaran kooperatif Think Pair Share (TPS) terhadap kemajuan matematika siswa. Kuasi-eksperimental menjelaskan metode penelitian ini. Siswa dari kedua kelas tujuh di SMP Negeri 4 Tabukan Utara diikutsertakan dalam penelitian ini. Informasi tersebut diperoleh dari tes yang dirancang untuk mengukur pemahaman Pecahan Aljabar. Hasil analisis kelas untuk kelas model pembelajaran Kooperatif Think Pair Share dan kelas model pembelajaran langsung menunjukkan bahwa rata-rata hasil belajar siswa yang diajar dengan model pembelajaran Kooperatif Think Pair Share lebih banyak dibandingkan dengan hasil belajar siswa yang dibelajarkan dengan pembelajaran langsung. model.*

Kata kunci: Model Kooperatif, Think Pair Share, Pembelajaran Matematika, Pecahan

INTRODUCTION

Education is a process of learning knowledge and skills carried out through teaching, training and research. Education is a conscious effort carried out systematically in which teacher-teaching and student-learning activities support each other to achieve a goal (Wati & Trihantoyo, 2020; Nasution, 2021). Teaching activities carried out by teachers and learning activities carried out by students influence each other in facilitating the learning process (Prianto & Putri, 2017; Cahyani, 2021; Sabila et al., 2021).

Various problems have hampered the development of the world of education; one of the most common problems is student learning outcomes. A person's learning success is influenced by many factors, which in outline can be divided into two kinds, namely

factors from within the student (internal) and factors from outside the student (external) (Mawarsih & Hamidi, 2013); Amri, 2018). Factors from within students are significant factors in determining learning outcomes (Nabillah & Abadi, 2020; Salsabila & Puspitasari, 2020). This is understandable because students are the main subjects targeted in the learning process (Jayawardana, 2017; Suwardi & Puspitasari, 2020). Each student has a different ability to absorb the lessons they get from the teacher; in this case, the role of a teacher is significant so that students can follow the lesson well (Wassahua, 2016; Windarto, 2020). Therefore the teacher must be able to generate motivation to learn for students and direct students to learn well without feeling forced.

Along with the continued development of Science and Technology (IPTEK), education at this time should be based on the level of quality and ability of teachers to use various existing learning methods to deal with problems faced by students. Besides that, Teachers as educators must also prepare learning that can foster students' thinking to become more critical and creative. A familiar problem teachers encounter is difficulty achieving their goals (Hizbullah & Mardiah, 2015). The goal referred to here is the goal that is expected of a teacher personally when teaching (Sari, 2018). This is caused by various factors around the teacher that influence it. In terms of students, of course, many things can happen. For example, students do not pay attention in class, students do not carry out their assignments as expected, students are not interested in the subjects being taught, and students are too concentrated on other things; all of these will affect learning outcomes so that learning objectives will be challenging to achieve.

Mathematics is crucial in various aspects of life, especially in developing Science and Technology (IPTEK). Mathematics trains students to think logically, critically, rationally and confidently (Lestari, 2017; Janah et al., 2019). For this reason, learning mathematics is given to students from every level of education, starting from elementary, junior high and high school. However, students often consider mathematics a subject that is difficult to understand in its application, both theory and concepts, causing mathematics learning achievement not to show satisfactory results. One of the materials in mathematics that still needs to be improved for students to understand is algebraic material, especially on the subject of algebraic fractions.

An interview with one of the mathematics teachers at SMP Negeri 4 Tabuk Utara revealed that student learning outcomes remained low, particularly with respect to fractional algebraic material. Consequently, fractions in algebra must be emphasized more in mathematics education.

The material for algebraic fractions is one of the materials in mathematics, which is considered quite difficult by most students because, in the process, it requires an understanding. One alternative that can be taken to improve student achievement in mathematics is through the creativity of teachers in choosing innovative learning models. Students can be actively involved in following the teaching and learning process. Students can exchange ideas through group discussions given. However, current mathematics learning only emphasizes mastery of concepts. Most mathematics learning is carried out using the direct learning model so that students do not get the opportunity to be active in the teaching and learning process, which results in decreased learning outcomes.

The Think Pair Share Cooperative Learning Model is one of the pertinent learning models. Think-Pair-Share is a type of cooperative learning model in which students are given individual problems to solve (Think) before working in pairs (Pair) to solve them. The teacher divides students into pairs into groups (Pairs). In the group, each student shares the results of his thoughts with each group member (share). By applying the Think Pair Share Cooperative learning model, students can be involved in the thought process and work together in solving problems or problems given by the teacher.

According to Rianingsih, the advantage of the Think Pair Share Cooperative learning model is that it can foster a communicative learning environment in which students share information with other group members. According to Jasdilla, selecting the Cooperative learning model of the Think Pair Share type can boost student achievement in learning.

Based on the preceding description, this article discusses the outcomes of implementing the Think Pair Share Cooperative Learning Model in Algebraic Fractions.

METHOD

This type of research is quasi-experimental research. This research will be conducted at North Tabukan 4 Public Middle School during the odd semester of the 2021-2022 school year. The subjects of this study were all seventh-grade SMP Negeri 4 North

Tabuk students. This study utilized two randomly selected study groups, one as the experimental class and the other as the control class. Due to the experimental nature of this study, a pretest-posttest control group design has been employed. In this instance, the researcher utilized two randomly selected classes, namely the experimental class and the control class. In the experimental and control groups, a three-question essay test was administered as the research instrument. The technique for collecting data utilizes a test of learning achievement from both the experimental and control classes. As data, we use the pre-and post-test results from the experimental and control groups.

RESULT AND DISCUSSION

The descriptive data presented in this study are the student learning outcomes scores for the Think Pair Share Cooperative learning model and the direct learning model. The data was collected from seventh grade classes VII A and VII B at SMP Negeri 4 Tabuk Utarter. The researcher obtained the data by comparing the pre- and post-test scores. Pretest and posttest values range from 0 to 100.

The following table provides a summary of the student learning outcomes associated with the study of algebraic fractions.

Table 1. Data on pretest learning outcomes taught using the Think Pair Share Cooperative Learning Model and the Direct Learning Model

No	Statistic	Learning Model	
		Cooperative Type Think Pair Share	**Direct Learning**
1	Maximum Score	50	50
2	Minimum Score	25	20
3	Total Score	790	720
4	Average	39,5	36
5	Standard Deviation	7,23	8,97

The experimental class (the class using the think pair share cooperative learning model) had an average value of 39.5, while the control class (the class using the direct learning model) had an average value of 36.

Table 2. Posttest Learning Outcomes Data Taught Using the Think Pair Share Cooperative Learning Model and the Direct Learning Model

No	Statistic	Learning Model	
		Cooperative Type Think Pair Share	**Direct Learning**
1	Maximum Score	80	70
2	Minimum Score	50	40
3	Total Score	1.416	1.150
4	Average	70,8	57,5
5	Standard Deviation	8,13	7,86

The experimental class obtained a mean score of 70.8 on the final test (posttest) assessing the learning outcomes of the material on algebraic fractions. In contrast, the average value for the control group was 57.5. In inferential statistics, the prerequisite analysis is examined prior to conducting the t-test on the hypothesis. The Data Normality Test and the Variance Homogeneity Test are prerequisites. The information utilized is the difference between the pre- and post-test scores. Utilizing Microsoft Office Excel, Liliefors's statistics are used for data testing. The information is presented in the following table.

Table 3. Summary of the Normality Test of Learning

Class	Liliefors Test (L_{count})	L_{table}	Conclusion
Cooperative learning model Think Pair Share Type	0,12	0.19	Accept H_0
Direct Learning Model	0,14	0.19	Accept H_0

Based on Table 3 above, it is obtained that L_{count} for the experimental class is 0.12 and L_{table} ($\alpha = 0.05$; $n = 20$) is 0.19. Whereas for the control class, the value L_{count} is 0.14 and L_{table} ($\alpha = 0.05$; $n = 20$) is 0.19. Thus, experimental and control class research samples meet the criteria, or the data is normally distributed. Hypothesis testing uses the F-test

or Fisher's test to test whether the two classes are homogeneous. The test criteria used are if $F_{count} < F_{table}$, then H_0 is accepted, or the data can be declared homogeneous. However, if $F_{count} \geq F_{table}$, then H_0 is rejected, or the data is not homogeneous. The following table for the data homogeneity test:

Table 4. Summary of Homogeneity Test Results

n_1	n_2	S_1^2	S_2^2	Fcount	Ftable	Conclusion
20	20	$(8,13)^2$	$(7,86)^2$	0,06	2,86	Homogen

The following are the results of the t-test for the experimental class and the control class:

Table 5. Summary of Hypothesis Testing Results Statistics

	Statistic Data	
	Experiment Class	**Control Class**
N	20	20
$\bar{X}$	70,8	57,5
Standard Deviation	8,13	7,86
T_{count}	5,28	
T_{table}	2,02	
Conclusion	H_1 Accept	

For the 2021/2022 school year, research data on learning mathematics in algebraic fractions reveals disparities between the experimental class using the Think Pair Share Cooperative learning model and the control class using the Direct learning model. In the experimental class, the average student learning outcome is 70,8 points higher than in the control class, which is 57.5. This demonstrates that the Cooperative learning model of the ThinkkPair Share type is a learning model that can motivate students to explore material information that is discovered and manifested in learning outcomes.

The results of the t-test for testing the hypothesis indicate that $t_{count} > t_{table}$, or $t_{count} = 5.28 > t_{table} = 2.02$, indicating that the test statistic falls within the critical region. This demonstrates that there is sufficient evidence to accept H_1. Therefore, it follows that H_0

should be rejected and H_1 should be accepted, namely $1 > 2$. The average learning outcomes of students taught using the Think Pair Share Cooperative learning model are greater than those taught using the direct learning model.

CONCLUSION

Based on research conducted using the Cooperative learning model of the Think Pair Share type in learning mathematics fraction material, the researchers draw the following conclusions:

1. The Cooperative learning model of the Think Pair Share type is a learning model that emphasizes student thinking and student skills. This learning model gives students more time to think, answer, develop and help each other construct a material concept so that this model is very effectively used in the learning process.

2. The learning outcomes of students taught using the Cooperative learning model of the Think Pair Share type are more than the direct learning model. Thus the Cooperative learning model of the Think Pair Share type can improve student learning outcomes and is better used in the learning process, especially in algebraic fraction material.

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