The effect of cooperative learning model of think pair share with group advisor strategy on students' mathematics learning achievement on number pattern material

Wanda Suhari Ningsih*, Laili Habibah Pasaribu, Amin Harahap

Universitas Labuhanbatu, Indonesia

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ABSTRACT

This study aims to analyze the effect of the Think Pair Share (TPS) cooperative learning model combined with the Group Advisor strategy on students' mathematics learning achievement at MTs Al-Ittihad. The research method used is an experiment with a pre-post-test design in one group. Data was collected through mathematics learning achievement tests given before and after treatment, as well as interviews to obtain qualitative data about students' experiences when applying this learning model. Data analysis was conducted using a t-test to determine the difference in learning achievement before and after treatment. The results of the study show that there is a significant increase in student mathematics learning achievement after the application of the TPS model with the Group Counseling strategy. This finding shows that the application of the TPS cooperative learning model with the Group Advisor strategy is effective in improving students' mathematics learning achievement at MTs Al-Ittihad. This study provides empirical evidence that the TPS cooperative learning model with the Group Advisor strategy can be considered by teachers as an effective alternative in efforts to improve the quality of mathematics learning.

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INTRODUCTION

Learning is one of the main processes in education. Students can understand the surrounding environment and realize certain behaviors as a result of the learning they receive. Educators must be familiar with various types of learning models in the hope that educators have a choice in applying the appropriate learning model to the students being educated. In general, children tend not to be motivated to develop thinking skills in the learning process received (Malik et al., 2024).

Education is intended as a means to increase or develop the potential, talents and interests of students in order to create quality human resources (Nurhayati et al., 2022). Education is planned in a complex network of activities that connect

interactions, so that communication occurs between individuals and forms a perfect human personality in the hope of providing benefits (Muamanah, Hidayatul., 2020). Education is a learning activity carried out by an individual is a conscious action carried out by a person to improve the function of skills and development including cognitive, affective and psychomotor abilities. (Amanda et al., 2024).

As a science that is learned as an element of education at school, mathematics plays an important role and is an indicator to compare the success of development and the development of the quality of human resources (Kurniawan & Matematika, 2023). The problem of the effectiveness of mathematics learning among school students is low, so it needs to be given wide attention by the Ministry of Education (Meles & Ali, 2024). Mathematics requires an understanding of deep concepts of logical reasoning and systematic thinking (Gultom et al., 2024).

Education in Indonesia is still lagging behind other countries, one of the factors is that society has not yet realized the importance of education and with the large number of students who do not continue to higher education levels, then education in Indonesia is rooted in the nation. culture based on Pancasila and the 1945 Constitution continues to be maintained, developed, equipped with various regulatory provisions and prioritizing equalization and improving the quality of education. (Pandiangan et al., 2018).

Improving students' intellectual abilities is the effect of teaching mathematics in (Afsari et al., 2021). The preparation of materials in mathematics lessons can start from the introduction since children are at the most basic, secondary and higher education levels (Anderha & Maskar, 2021). The situation that becomes a problem is when the child is a teenager who experiences difficulties with an average level of intelligence (Gultom et al., 2024). Mathematics has a stereotype in the eyes of the general public as a subject that is difficult to understand and requires a high level of logical thinking (Amanda et al., 2024).

Mathematics has become a stagnant entity in life where people will always learn, until in the modern age people learn to get the latest information in the nearest and broad period of time. In response to this phenomenon, mathematics provides the latest information and is called the king of science. Mathematics presents a variety of materials that intersect with efforts to improve everyone's standard of living, there are materials in the form of change, space, and size. Understand that mathematics is a dynamic science that requires an adaptive pattern to the changing needs of students. Mathematics is very important in helping aspects of achieving a successful and prosperous human life, so mathematics should develop.

The school's mission to teach mathematics is to support the achievement of national educational goals. Mathematics is prioritized and must be studied at school by (Munthe & Pasaribu, 2023). Mathematics is a list of subjects that students are not very interested in, although mathematics has its own special features where it trains logical, responsive, diligent, practical, valid, and effective thinking and is of high value. For many students, mathematics is still seen as the most avoided subject because it is scary and difficult. This is evidenced by the constant worry, fear, doubt and lack of interest among students. As a result, the effectiveness of teaching mathematics is affected, as students show a lack of motivation in dealing with the problems presented by their teachers.

The concept of mathematics shows that educators need to use appropriate learning methods in instructing and guiding students so that students can

understand mathematical concepts so that they can use the concepts learned in finding solutions to the mathematical problems they will solve. (Harahap et al., 2022).

On the other hand, students who like mathematics consider mathematics as an interesting and fun subject, they are excited and eager to complete the mathematical tasks given by the teacher. The difference in students' perception and response to mathematics can affect their learning achievement. Mathematics with its abstract subject and hierarchical structure, presents a unique challenge in education. It is important for mathematics teachers to reduce, if not completely eliminate, the abstract nature of this concept in order to improve students' understanding of the material in school (Heriyati, 2017). Student success in learning can be influenced by factors from within the individual and outside the individual. There are many things that affect the process of teaching and learning mathematics at school, both from outside the students and the environment and from within the students themselves (Nursalma & Pujiastuti, 2023).

Learning media is an important component in the educational process, serving as a resource that can significantly broaden students' perspectives. By using various teaching media, teachers can increase the spread of knowledge to students. The use of interesting learning media can stimulate students' interest to explore new concepts presented by their teachers, further facilitating better understanding. Interesting learning media can act as a catalyst in the educational process, emphasizing the need for effective management of teaching aids in formal educational environments. Teachers must wisely choose and use appropriate learning media to ensure the achievement of the school's educational objectives (Nurrita, 2018).

Recognizing the critical role of effective learning models in fostering students' interest in mathematics, it is important to implement teaching strategies that involve students actively in the learning process. This objective can be achieved by designing learning experiences that encourage student participation and involvement (Larasati et al., 2024). One of the learning models that can support successful outcomes is using the TPS cooperative learning model with group advisory strategies as support.

Think-Pair-Share (TPS) learning can improve the ability to verbalize thoughts and compare them with others' ideas, foster respect for others and awareness of one's limitations while embracing diversity. The interaction that occurs during this learning process can increase motivation and stimulate critical thinking, which is beneficial for long-term educational development. In addition, TPS learning fosters important skills for the contemporary world, encouraging cooperation and efficiency in group work (Emda, 2014).

The cooperative learning model is a learning model of finding pairs between the group carrying the question card and the group carrying the answer card, after matching their cards before the specified time limit, they will be given points. This model can foster students' creativity because through matching questions and answers, it will develop by itself (Uki & Liunokas, 2021). This teaching model creates opportunities for students to engage in critical thinking, respond independently, and collaborate with each other. Using the TPS learning model will add a variety of learning models at MTS AL- Ittihad Aek Nabara that are more interesting, fun, and increase student activity and collaboration. (Jumrah, 2023).

During an interview with Mr. Karyadi S.Pd., a mathematics teacher at MTS AL-Ittihad on September 26, 2023, it was found that half of the students in class

VIII-D have a below average understanding of mathematics. Observations from daily classroom interactions show that students often remain passive when asked questions or required to provide answers, indicating a lack of understanding during the lesson. Student achievement in mathematics is greatly influenced by the teaching methods used. Learning dynamics can flow from student to teacher, student to student, and not necessarily from teacher to student. Cooperative learning models, which facilitate structured collaborative tasks, offer students the flexibility to actively engage and support each other's learning.

This issue emphasizes the critical role of teachers in both curriculum development and the learning process. The teacher is not only the main source of learning but also the facilitator of education. With professional, pedagogical, personal and social competence, teachers can effectively implement and achieve learning objectives (Aritonang & Armanto, 2022).

Due to the problem, the researcher wants to conduct a study on the "Effect of Think Pair Share Cooperative Learning Model with Group Counseling Strategy on Mathematical Learning Achievements on Number Pattern Materials at MTs Al-Ittihad". This research aims to support and improve student participation and learning outcomes, as the TPS cooperative learning model is considered to be able to encourage students to be more courageous and expressive in the learning process in the classroom. This research is also supported by the group advisory strategy given to the students to get feedback from the students after learning or knowledge about the material taught before. (Asrina et al., 2021).

METHOD

This study uses quantitative research with an experimental method with a pre-test-post-test design in one group (one-group pre-test-post-test design). The research was conducted at MTs Al-Ittihad, precisely in class VIII. All grade VIII students amounting to 4 classes became the research population at MTs Al-Ittihad. The total sample was obtained from the Simple Random Sampling technique and collected a total of 30 students of class VIII-D (Sugiyono, 2017).

Simple Random Sampling is a planned sampling technique through a population with members of the sample taken at random and requiring no special criteria. Therefore, the sampling results are taken randomly, in one experimental class using the TPS model as a learning model.

Table 1. The One Group Pretest-Posttest Design

Class	Pretest	Treatment	Postest
Experiment	O_1	X	O_2

Description:
O_1 = Pre-test score
X = The effect of the TPS learning model with the Group Advisor strategy
O_2 = Post-test value

Before administering the test to the students, the instrument underwent a validation and reliability test. This assessment was conducted to measure initial abilities (pre-test) and final results (post-test) following the application of the TPS learning model with Group Counseling strategies. Data from the pre-test and post-test were analyzed using descriptive statistics to summarize the data, the normality test to confirm whether the data were normally distributed, the homogeneity test to ensure the variance of the data was uniform, and the t-test to identify significant differences between the pre-test and the post-test. post test results. This analysis aims to evaluate the hypothesis regarding the impact of the

TPS learning model with the Group Advisor strategy.

RESULTS AND DISCUSSION

The results of this study explain the summary of pretest and posttest scores.

Table 2. Pretest and Posttest Results of Student Learning Achievement

Statistik	Pretest	Posttest
Mean	31,50	84,63
Varians	4,052	9,620
Deviasi Standar	11,102	12,808
Maksimum	60	90
Minimum	15	80

Table 2 presents the difference in student scores before being given the pretest average value treatment to 31.50, data variance 4.052, data standard deviation 11.102, maximum value 60 and minimum value 15. However, after applying TPS (Thinking Pair Share) cooperative. learning model with group advisory strategy produces an average value of 84.63, data variance of 9.620, data standard deviation of 12.808, maximum value of 90 and minimum value of 80.

Normality testing was carried out using the Kolmogorov-Smirnov formula, with the condition that if the sig value > significant level ($\alpha = 0.05$) then the data is normally distributed.

Table 3. Normality Test Results

Statistika	Results
Sig	0,178
Kolmogorov-Smirnov Test	Sig > 0,05
Decision	Normal Data

Calculation of homogeneity test results using Analysis Of Variance (ANOVA), the data can be said to be homogeneous if the sig value > significant level ($\alpha = 0.05$) then the data is normally distributed.

Table 4. Homogeneity Test Results

Statistika	Results
Sig	0,231
Uji Leven's Test	Sig > 0,05
Decision	Normal Data

According to the data analysis prerequisite test schedule, both samples are normal and homogeneous. Then the calculation of hypothesis test analysis using Sample Paired T-test. If the significant value is < 0.05, then Ho is rejected and Ha is accepted (there is an influence of the cooperative learning model TPS (Thinking Pair Share) with the group advisory strategy) and if the significant value is > 0.05, then Ho is accepted and Ha is rejected (there is no effect of the cooperative learning model TPS (Thinking Pair Share) with group advisory strategies).

Table 5. Paried Sample t-test Hypothesis Test Results

Uji Hipotesis *Paried Sample t-test*	Results
Sig.(2-tailed)	0,000
Criteria	Sig < 0,05
value of t_{table}	2,045
value of t_{test}	20,974
Decision	**Ho is rejected and Ha is accepted**

Based on Table 5 above, the results of the Paired Sample t-test conducted in the experimental class are known that sig. the significance level value is $0.000 < 0.05$ and the $|t_{test}| > |t_{table}|$ i.e. $20.974 > 2.045$, then the result Ho is rejected and Ha is accepted (there is an effect of the Think Pair Share cooperative learning model with group advisory strategy on the achievement of mathematics learning).

According to Sudarsana, (2018) Cooperative learning makes a great contribution, that is, it can improve students' academic abilities, this produces constructive benefits especially for students of lower groups and group categories from the existence of cooperation in completing assignments from the teacher. Upper group students play a role in developing their cognitive competence, their function is to maximize services for the peer group (Ghina & Ganda, 2024). Critical thinking is a necessary asset as a tutor, critical thinking is that students can connect and connect certain learning through ideas in every material meeting (Padmakrisya & Meiliasari, 2023). Based on cognitive elaboration theory, the application of cooperative strategies in learning will have an impact on students who do not understand the learning material well to absorb the material more easily due to the help of cooperation from academically superior peers (Mahyudin & Alihsan, 2023).

Based on the data description of the pre-test and post-test results, there is a difference in the average value of the students. With an average pre-test value of 31.50 while the average value on the post-test is 84.63. The minimum value on the pre-test is 15 while the minimum value on the post-test is 80. The maximum value on the pre-test is 60 while the maximum value on the post-test is 90. So, it can be concluded that the student's learning achievement value results after being treated with the cooperative learning model of TPS with the group advisory strategy has increased in value better than the learning outcomes before treatment.

Based on the results of data analysis, both samples are normal and homogeneous as evidenced in table 3 and table 4. In the hypothesis test, it was found that the results of the Paired Sample t-test conducted in the experimental class are known that sig. the significance level value is $0.000 < 0.05$ and the $|t_{test}| > |t_{table}|$ which is $20.974 > 2.045$, then the result Ho is rejected and Ha is accepted which proves that there is an influence of TPS cooperative learning model with group advisory strategy on the achievement of mathematics learning on number pattern material at MTs Al-Ittihad.

Thus, the results of this study concluded that the TPS cooperative learning model with group advisory strategy has a significant effect on student learning achievement in number theory material at MTS AL-Ittihad. The learning model shows superiority in improving student learning achievement because the learning model involves student learning activity.

This research is in line with previous research conducted by (Husna,

2021), which concludes that there is an influence of the Think Pair Share (TPS) cooperative learning model on the mathematics learning outcomes of class VIII students at SMP Negeri 10 Mandau. This can be seen from the mathematics learning results of the experimental class students who use the Think Pair Share (TPS) cooperative learning model are better than the mathematics learning results of the control class students. However, the study only focused on the effectiveness of interaction between students in improving student learning outcomes and did not consider additional strategies that could further optimize student learning outcomes.

While based on the results of research conducted by Dewi & Sungkono, (2019) said that through the application of learning strategies, advisory groups can increase the activities and learning outcomes of students' mathematics. With the application of advisory group learning strategies, students easily master the learning content, understand past material and students are more active during learning. This research emphasizes how advisory group strategies can improve students' mathematics learning activities and outcomes. However, this study did not combine the advisory group strategy with other learning models.

While this study adds a new dimension that shows the cooperative learning model of the TPS type with a group advisory strategy can improve students' mathematics learning achievements, especially in the number pattern material. This research introduces the Group Advisory strategy as an additional element in the TPS model. The Group Advisory Strategy involves forming small groups where each group has an "advisor" who helps direct the discussion and provides constructive feedback. By combining these two new combinations, it results in the combination of the TPS model and the Group Advisor strategy can have a more significant impact on students' mathematics learning achievement.

This research produces new findings that show that the combination of the Think Pair Share cooperative learning model with the Group Advisor strategy not only improves learning achievement and interaction between students, but also helps students develop a deeper understanding of mathematics subjects. The results of this study are expected to make an important contribution to the world of education, especially in devising more effective and innovative learning strategies to improve student achievement.

CONCLUSIONS AND SUGGESTIONS

Based on data analysis and the results of hypothesis testing, the cooperative learning model TPS (thingking pair share) in this study has an impact on students' mathematics learning, especially on number pattern material. The understanding of the concept of learning mathematics becomes significant when seen from the results of the pre-test before learning and the test is implemented then the results of the post-implementation test. Students' mathematics learning outcomes that are less than optimal are improved after using the TPS cooperative learning model with a group advisory strategy. The average value of the descriptive statistical analysis shows the understanding of class VIII-D MTS AL-Ittihad Aek Nabara students before applying the TPS cooperative learning model with the group advisory strategy is 31.50 with a standard deviation of 12.808, after the application of TPS. cooperative learning with group advisory strategy, the average value increased to 83.07.

The suggestion for further research is the need to combine both

aspects such as the application of the TPS learning model with group advisory strategies in order to create optimal learning activities that impact student learning outcomes. The improvement of the learning outcomes presented by the researcher is that the TPS cooperative method with the group advisory strategy should continue to be used given the large number of students who find it difficult to understand mathematics subjects. Or students at MTS AL-ittihad can find variations of other learning models that are easy to understand so that the teaching and learning process can vary.

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