



The influence of the teams games tournament type cooperative learning model on elementary school students' mathematics learning outcomes

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ABSTRACT

The purpose of this research is to determine the effect of a team game tournament learning model on the mathematical performance of high school students using blocks and cubes as instructional tools. This experimental design consists of a pre- and post-test control group with twenty samples each. This study included a total of 60 students from Grade V SD IT Syifaurrehman Patumbak, with 30 students from Grade VA and 30 students from Grade VB serving as samples. The homogeneity test is carried out in accordance with the research results after the normality test. The results of students' mathematics learning were influenced by the teaching model of teams games tournament, according to statistical data ($p = 0.026 < 0.05$). The results show that this model rejects the null hypothesis and supports the alternative hypothesis.

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INTRODUCTION

Education seeks to provide opportunities for students to improve their religious beliefs, self-discipline, intelligence, character, attitudes and abilities through planned and organized learning arrangements and procedures. A country's capacity to continue growth its economy depends on the quality of its human resources, and education is a key factor in improving that quality (Marpaung et al., 2024). The aim of education, as stated by Sujana, is to help the participants' body and soul education in the transition from the natural state to a more ideal human society (Arifin, 2022). According to Setyaedhi, getting a good education is the best way to improve living standards (Setyaedhi, 2023). An important sign of a country's development is the quality of its education system, which in turn enables high-quality education. A better quality of life can be achieved through education. Only with a solid education system can students receive an education of the highest possible standards. A high level of education indicates the quality of a country's resources, and is therefore considered an indicator of progress.

Education, which comes from the verb "to educate", according to the KBBI, means "to encourage, instructor guide in the development of moral character and intellectual capacity". Teaching, training, educational activities, and approaches all contribute to the goal of human

development, which is why education is characterized as the process of changing a person's attitudes and behavior due to its pervasive nature. (Lutfiah et al., 2022). Education is a fundamental human right (Badar & Bakri, 2022). A person's humanity is reflected and pursued through education. Education is needed by all parties and components (Subekti, 2022). The ultimate goal of education must be to create godly people, and more specifically, people who are willing to devote their lives to serving God (Billah et al., 2023). Education, according to Ki Hajar Dewantara, must encourage the moral, intellectual and physical development of students so that they can realize their full potential as individuals and make positive contributions to society while preserving nature.

Improving student learning outcomes at all levels of education is a key component of a high-quality national education system, and educators play a critical role in this effort (Somayana, 2020). The learning, emotional, cognitive and psychomotor strategies used by teachers have a significant impact on the results achieved by students in the classroom (Indah Hafizhah et al., 2022). Mathematicians investigate both quantitative and qualitative reasoning methods. The ability to think more logically can be fostered by studying mathematics, a subject that is applied every day, this is because mathematics has the ability to improve human reasoning and thinking (Marfu'ah et al., 2022). Progress in life is driven by ever-increasing human demands, and mathematics permeates every aspect of human behavior (Putri & Ferianto, 2023). As a result, mathematics is now master and servant to other areas of technology. The reason mathematics is considered the queen of sciences is because mathematics advances several fields, including philosophy, independently of others (Nurdayani & Rahmawati, 2023). Students are encouraged to understand mathematical facts, concepts, principles, and skills as best as possible through mathematics education programs. According to (Lusianisita & Rahaju, 2020) Each student has unique abilities in terms of understanding and solving difficulties.

The many uses of mathematics in the real world strengthen its status as an important scientific discipline. According to (Sihombing et al., 2021) An important part of learning mathematics is building a basic understanding of concepts that can be applied to mathematical and non-mathematical problems. To understand an idea, you need to know what a concept is and how it works. Understanding thoroughly is the definition of "understanding" in the Big Indonesian Dictionary. However, why is mathematics seen by many people as a negative influence on children in the world of education? So, it is very important for educators to find innovative approaches to teaching mathematics if they want their students, especially those in primary school, to find this subject interesting and less intimidating. (Septiana et al., 2022).

Teachers must be proficient in a particular subject's learning model if they want to increase student attention in class (Satria Wiguna, Zaifatur Ridha, 2022). Learning models can influence learning, according to (Sapoetra & Hardini, 2020). Furthermore, students will not learn as much as they could with a skilled educator's methods. Mathematics education is still beset by various problems, as shown by the practices at SD IT Syifaurrehman. Syifaurrehman IT Elementary School has problems in learning mathematics. Many class V students do not pay attention to the teacher's guidance and there is no interaction between the teacher and students. This is because the teacher only explains without giving examples.

As a result, many students are sleepy and bored. Apart from that, teachers also do not understand how to increase students' interest in learning by using creative learning models or learning support media throughout the process.

The learning model used should be able to increase student enthusiasm, curiosity and learning outcomes. One model that can be used to increase student enthusiasm and learning outcomes from several learning models is the Teams Games Tournament Type Cooperative Learning learning model. The majority of fifth grade students paid little attention in class, and neither teachers nor students engaged in any collaborative learning. This occurs because teachers do not check understanding by asking students to reflect on their own learning. Many children feel

sleepy and bored because of this. Teachers do not have strategies that can arouse curiosity students in learning and helping them remember information, such as presenting alternative learning models and offering additional material.

Student engagement, motivation, and performance can benefit from a shift to a more efficient learning paradigm (Sholeh, 2023). Research shows that students are more engaged and retain more information when they participate in Teams Games Tournament (TGT), a cooperative learning strategy. In this paradigm, students complete group projects in a variety of collaborative environments (Nugraha et al., 2023). Although there are many educational methods, cooperative learning is the most prominent. Cooperative learning is different from other learning approaches, according to (Z. Hasanah & Himami, 2021). Students gain a deeper understanding of the overall concept of cooperation and skills in self-organization when they work in groups. This is where learning becomes different.

Cooperative learning is characterized by a type of teamwork (Suwarsa, 2020). Teams Games Tournament (TGT) is a type of cooperative learning that can overcome all the problems above. Its ability to turn all students into instructors and its game-like quality led researchers to choose the TGT learning paradigm. The Teams Games Tournament (TGT) concept is a simple, inclusive and engaging way for students to work together in a classroom setting (U. Hasanah et al., 2020)

RESEARCH METHODOLOGY

Experiment is the term used to describe this type of research. The quantitative character and reliance on experimentation are characteristic of experimental research. The goal of a controlled experiment is to determine the relationship between a treatment or independent variable and an outcome. 60 class V students from SD IT Syifaurrehman Patumbak participated in this research, consisting of 30 class I students and 30 class II students. Class V students come from various backgrounds and have a variety of skills. Both students and instructors are the subjects of research on the correlation between mathematics education and academic achievement. This Purposive Sampling research involved 60 students from SD IT Syifaurrehman Patumbak, divided evenly between Class A and Class B. This research involved all students in class V of SD IT Syifaurrehman Patumbak, consisting of 60 students, consisting of 30 students in class A and 30 students in class B. The condition of students in class V was heterogeneous, with different abilities. Apart from students, educators are also the subject of research on teaching practices. Mathematics learning outcomes are the subject of research.

RESULTS AND DISCUSSIONS

Mathematics Learning Results for Students Taught with the Teams Games Tournament Type Cooperative Learning Model

When taught using the Teams Games Tournament Cooperative Learning paradigm, students achieved math scores ranging from 70 to 100. On a scale of 86.81, the standard deviation is 9.31. As in the image below, a histogram is a graphical depiction from data relating to the sampling distribution:

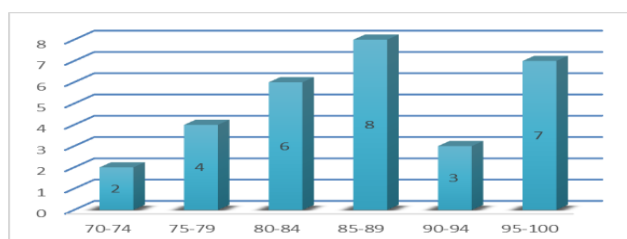


Figure 1. Histogram of mathematics learning results for group A students

Mathematics Learning Results for Students Taught with the Numbered Head Together Cooperative Learning Model

Mathematics learning outcomes on the Numbered Head Together Type Cooperative Learning scale vary from 100 to 65, with 80 representing the average, 76.70 representing the standard deviation, and 8.76 representing the variance. The following is a histogram showing the results of mathematics lessons taught using the Numbered Head Together Type Cooperative Learning model:

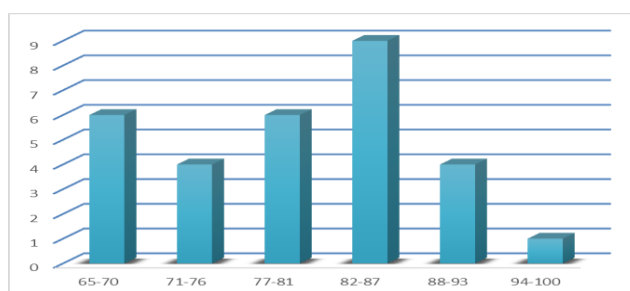


Figure 2. Histogram of mathematics learning results for group B students

a. Test Normality

Table 1. Testing the normality of research data

N		30
Normal Parameters, b	Mean	,0000000
	Std. Deviation	9,29783778
Most Extreme Differences	Absolute	,130
	Positive	,130
	Negative	-,126
Statistical Tests		,130
Asymp. Sig. (2-tailed)		,200c,d

As can be seen from the table, the research data was found to be normally distributed with a significant probability value of $0.200 > 0.05$. Therefore, the normal distribution is the most suitable for this research data.

b. Homogeneity Test

Table 2. Testing the homogeneity of research data

		Levene	df1	df1	Sig.
		Statistics			
Mathematics	Based on Mean	,111	1	58	,730
Learning	Based on Median	,053	1	58	,818
Outcomes	Based on Median and with	,053	1	57,549	,818
	adjusted df				
	Based on trimmed mean	,133	1	58	,717

Based on results Testing the homogeneity of the data presented in table 2 above, the researcher obtained a significant value of $0.730 > 0.05$. After running the data through a homogeneity test, researchers can say with confidence that the data set is fairly consistent.

c. Hypothesis Testing

Table 3. Research data t test results

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	Df	Sig. (1-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Mathematics Learning Outcomes	Equal variances assumed	,111	,730	1,185	58	,026	5.33333	1.33456	,66019	10.00647
	Equal variances not assumed			1,185	57,779	,026	5.33333	1.33456	,65981	10.00685

The two-sided significance value is 0.026, which is less than 0.05, according to the t-test table. Students in Group A outperformed students in Group B on math tests. The results of the t-test show that the two-sided significance value is 0.026, which is lower than the threshold of 0.05. Students in Group A outperformed students in Group B in mathematics by a considerable margin. By using game features to aid learning, cooperative learning techniques such as Teams Games Tournaments can be implemented.

Discussion

According to Setyowati and Al Masjid (2022), academic competitions are a common setting for students to demonstrate their knowledge of the TGT learning paradigm as they compete as team representatives. Apart from encouraging students to take the initiative, work together, compete constructively, and participate actively in their own education, the TGT model also provides students with the opportunity to learn in a more relaxed environment (Rani, 2022).

To measure the extent to which students have learned mathematics, the multiple choice pretest serves as initial data. After taking the pretest, the majority of students in classes A and B showed a lack of strong understanding of the subject matter. Based on statistical calculations carried out using SPSS version 26, the pretest scores for class B ranged from 35 to 70, with 56 as the average value, 55 as the middle value, and 55 as the mode value. For comparison, class A pretest scores range from 40 to 80, with 58 as the average score, 60 as the middle score, and 60 as the median score. The absence of statistically significant differences between the learning outcomes of Class A and Class B students indicates that the mathematics competence of the two groups is almost the same.

Class A students use the TGT learning approach. Here we can see what students in class A do while they study. To increase students' knowledge about shapes, especially cubes and blocks, the teacher introduces the concept of geometric figures at the beginning of the activity. After that, the class works in teams or individually to compete against each other. To begin, the class works in small groups, and the teacher uses the game of snakes and ladders as a medium. It is hoped that the questions asked are related to the subjects discussed. In a game similar to snakes and ladders, players take turns rolling dice and drawing question cards. Whoever can answer the most questions at the end of the game will win.

At the same time, the NHT learning model is used to teach mathematics in class A. Students work in small groups to complete assignments related to the lesson after the teacher provides an introduction. After students form groups, the teacher will give them numbers and

problems to solve. After the time specified for discussion has passed, the teacher will call the class by saying their respective numbers.

Taking a post-test is the next step after completing the tests and learning in each class. Students will be tested again after studying spatial mathematics using both the TGT model and the NHT model. The purpose of this post-test is to compare the performance of the two groups.

Class A students use the TGT method to conquer their fear of public speaking, improve their abilities as team players, and find new ways to enjoy learning. Group work was successfully carried out by students taught using the NHT method in Class B, as well as in Class A. However, some students remained silent because they were afraid or did not have the opportunity. The following is a comparison of students' mathematics achievements in Classes A and B. This difference is clearly visible when looking at the posttest results side by side.

CONCLUSION

Based on the research results, it can be concluded that the Teams Games Tournament type cooperative learning model has an effect on students' mathematics learning outcomes ($t_{count} = 2.285$ and $sig. 0.026 < 0.05$). This research is only limited to learning treatment by applying the TGT and NHT learning models. Apart from that, this research is also limited to the results of learning mathematics regarding geometric material. Students' learning activities outside of school which are related to mathematics learning outcomes regarding geometric material cannot be controlled optimally, so they can affect the learning process while at school. The suggestion in this research is that teachers should develop a new type of cooperative Teams Games Tournament model to improve student learning outcomes because this model is very effective in improving students' mathematical abilities. The TGT learning model must be used in schools to increase students' insight.

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