

Improving Sixth-Grade Students' Cognitive Achievement in Mathematics through the Teams Games Tournament (TGT) Cooperative Learning Model at SDN kemayoran 2

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Abstract

This study was conducted to address the low mathematics learning achievement of sixth-grade students at SDN Kemayoran 2. It aimed to describe the implementation of the Teams Games Tournament (TGT) cooperative learning model and examine its effectiveness in improving students' cognitive learning achievement. The study employed Classroom Action Research (CAR) based on the Kemmis and McTaggart model, involving 29 sixth-grade students in two cycles. Data were collected through observations, interviews, documentation, and achievement tests. The results showed a consistent improvement in learning mastery, increasing from 54.6% in the pre-cycle to 72.4% in Cycle I and 84.3% in Cycle II. These findings indicate that the TGT cooperative learning model effectively improved students' cognitive mathematics achievement and classroom participation.

Keywords– Mathematics Learning Achievement, Cognitive Learning Achievement, Classroom Action Research, Cooperative Learning, Teams Games Tournament (TGT).



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1. Introduction

Mathematics is an important subject that needs to be taught from the elementary school level because it can develop students' ability to think logically, analytically, and systematically from an early age (Sabila et al., 2026). Good mastery of mathematics is an important provision for students in facing various problems in daily life and in continuing education to a higher level. In addition, the thinking skills built through mathematics learning have an effect on the achievement of students' learning outcomes because they allow them to understand problems, analyze information, and determine appropriate and effective solutions (Wahyudi & Rafianti, 2025).

In fact, the mathematics learning outcomes of elementary school students are still relatively low. Many students have difficulty understanding concepts, solving problems, and applying mathematical knowledge in a variety of situations. One of the reasons is the use of *teacher-centered learning methods*, so students tend to be passive and less involved in the learning process. This condition was also found in grade VI students of SDN Kemayoran 2. Based on the results of observations, some students lack concentration during learning, as can be seen from the habit of chatting, playing alone, and not paying attention to the teacher's explanations. As a result, the learning process becomes less effective and students' cognitive abilities have not developed optimally. Therefore, a more active and interesting learning model is needed to increase student engagement and learning outcomes. Teachers also need to play a role as guides and motivators to foster students' enthusiasm for learning (Asagie, F. E. N., & Wulandari, M. D., 2025).

One of the learning models that can be applied is the Teams Games Tournament (TGT) type cooperative learning model. The TGT (Team Games Tournament) cooperative learning model is a type of cooperative learning that combines group cooperation with academic games and tournaments. This model involves all students regardless of status, treats students as peers, and incorporates elements of play and knowledge reinforcement. Team Games Tournament uses educational games in the form of tournaments so that students can compete as

representatives of their group against other groups (Aditya & Wahyudi, 2024). The application of the Teams Games Tournament (TGT) type cooperative model is expected to make students more motivated to participate in the class (Norfadila et al., 2024)

Previous research conducted by Nurhuda & Trisiana, (2024), shows that the application of the TGT model is able to improve students' mathematics learning outcomes through more active and collaborative learning activities. Furthermore, research conducted by Fatmawati et al., (2024) found that students who learned using the TGT model obtained higher mathematics learning outcomes compared to students who learned using conventional methods. In addition, Qona'ah et al., (2025), prove that the application of the TGT type *Cooperative Learning* model can significantly improve the mathematics learning outcomes of elementary school students.

Some of these studies highlight that the *Teams Games Tournament* (TGT) type cooperative learning model can improve mathematics learning outcomes, activeness, and learning motivation of elementary school students. However, most of the research is still limited to the aspect of mathematics learning outcomes in general, not much emphasis on improving the cognitive achievement of mathematics students in grade VI of elementary school in particular. Based on these data, there is still a research gap that shows that studies on the TGT model in mathematics learning focus more on improving learning outcomes and student activity, while studies that specifically examine the improvement of mathematical cognitive achievement of grade VI students are still relatively limited. In addition, the application of the TGT model to mathematics learning at SDN Kemayoran 2 has not been studied in depth. Therefore, this study presents a novelty by examining the application of the *Teams Games Tournament (TGT) type cooperative learning model* as an effort to improve the cognitive achievement of mathematics of grade VI students at SDN Kemayoran 2. The novelty of this research lies in the focus of the study that specifically measures the improvement of the cognitive ability of grade VI students through group cooperation activities, academic games, and tournaments in the context of mathematics learning in elementary schools. Thus,

this study is expected to make an empirical contribution to the effectiveness of the TGT model in improving the cognitive achievement of mathematics students in grade VI which was still rarely studied in previous research.

Based on this description, the researcher is interested in "Improving the cognitive achievement of grade VI students in mathematics through the cooperative learning model of Teams Games Tournament (TGT) at SDN Kemayoran 2". This research is expected not only to provide an overview of the process of applying the Teams Games Tournament (TGT) model in mathematics learning, but also to explain the extent to which the model can improve students' cognitive achievement through group cooperation activities, academic games, and tournaments.

2. .Method

The research design used in this study is classroom action research (PTK) which aims to improve students' cognitive abilities in Mathematics subjects. This study applies the research model developed by Kemmis and Mc Taggart, which is in the form of a repetitive cycle resembling a spiral, where each cycle continues to the next cycle according to research needs (Ariska, 2025). This research procedure was carried out in two cycles. Each cycle consists of four stages, namely planning, implementation of actions, observation, and reflection (Khomisah & Aberra, 2025). The implementation of class action research in each cycle can be illustrated as follows:

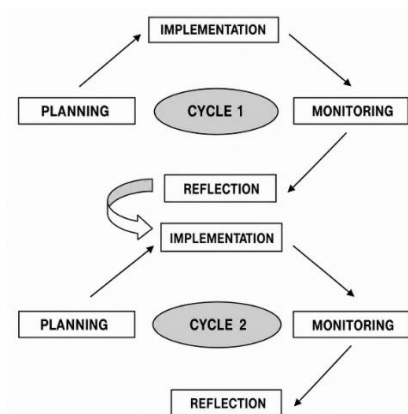


Figure 1. PTK design of the Kemmis and Robin Me Taggart model

This research began with the pre-cycle stage through initial observation and discussion with grade VI teachers of SDN Kemayoran 2 to identify Mathematics learning problems in opportunity materials. At this stage, students are also given a pre-test of 10 questions to find out their initial abilities before applying the Team Games Tournament (TGT) type cooperative learning model. Cycle I, the researcher compiles learning tools, research instruments, as well as educational media and games that support opportunity materials. Furthermore, learning is carried out using the TGT model through group discussion activities and educational games. During the learning, the researcher makes observations on the activities of the students and at the end of the learning gives a post-test. The results of observation and tests are then analyzed as reflection material for improvement in the next cycle. In cycle II, learning was again carried out using the TGT model by paying attention to the reflection results from cycle I. The researcher observed the students' activities and gave a post-test at the end of learning. The results obtained were then analyzed to determine the achievement of the indicators of research success.

Tabel 1. Reseach Schedule

Group	Week 1	Week 2	Week 3	Week 4
Preparation and permission requests	√			
Pre-cycle observations	√			
Development of early instruments	√			
Uji validitas dan reliabilitas instrumen	√			
Pelaksanaan siklus 1		√		
Refleksi siklus 1		√		
Pelaksanaan siklus 2			√	
Refleksi siklus 2			√	
In-depth data analysis				√
Preparation of the final draft report				√

- **First Week (Preparation):** Focus on obtaining research permits, conducting preliminary observations (pre-cycle), preparing learning tools and research instruments, and carrying out instrument validity and reliability testing.
- **Second Week (Cycle I):** Focus on implementing Cycle I, including planning, action, observation, and reflection activities. Data collection is conducted through observations, interviews, documentation, and learning achievement tests to identify students' initial progress after the implementation of the Team Games Tournament (TGT) learning model.
- **Third Week (Cycle II):** Focus on implementing Cycle II based on the results of the reflection from Cycle I. Activities include revising the learning plan, carrying out the action, conducting observations, interviews, documentation, and administering learning achievement tests to determine improvements in students' cognitive abilities and learning activities.
- **Fourth Week (Data Analysis and Reporting):** Focus on data reduction, data presentation, and conclusion drawing. At this stage, the researcher analyzes qualitative and quantitative data obtained from the pre-cycle, Cycle I, and Cycle II, followed by writing, revising, and finalizing the research report.

The subjects of this study are all students of grade VI of SDN Kemayoran 2 which totals 29 students, consisting of 11 female students and 18 male students. The technique of determining the research subject uses saturated sampling (total sampling), namely all members of the population are used as research subjects. Class VI was chosen based on the results of initial observations that showed that students' cognitive abilities in Mathematics subjects still need to be improved. This research was carried out at SDN Kemayoran 2, Bangkalan Regency in the even semester of the 2025/2026 Academic Year.

This study uses a mixed methods approach with the dominance of classroom action research (PTK). Qualitative data is used to describe the learning process through observation, interviews, and documentation, while quantitative data is used to measure the improvement of students' cognitive abilities through test results in each cycle (Gummah et al., 2026).

Data collection techniques are defined as methods or procedures that are carried out in data collection. The data collection technique used in this study is the interview technique (unstructured interview), which is an interview without developing guidelines for previous questions, which is adjusted to the conditions and characteristics of the source or informant (Ultavia et al., 2023) and the observation method is a data collection method that is carried out by directly observing phenomena or behaviors in the field. Through this technique, researchers can see and record events that occur in real conditions, without intervention or change from the researcher (Wani et al., 2024). Tests are one of the important evaluation tools in the education system to measure student learning outcomes (Andra et al., 2024). The documentation in this study was used to complete the data from the results of interviews and observations. The documentation method is a data collection technique by studying data that has been documented (Saádi, 2025).

The research instruments used consisted of observation sheets, interview guidelines, learning outcome tests, and documentation sheets. The use of these instruments is adjusted to the purpose of the research to obtain valid and relevant data about the learning process and outcomes (Ardiansyah et al., 2023).

- a. The observation sheet is used to observe students' activities during the learning process, which includes students' attention to the teacher's explanation, activeness in group discussions, cooperation between group members, participation in tournament activities, and students' involvement in completing the assigned assignments. The use of this observation sheet is in line with research that shows that student learning activities in cooperative learning can be systematically observed through indicators of student activity, cooperation, and participation during the learning process. In addition, observation sheets are also used as the main instrument to assess student involvement in various learning activities, including discussions and group work, which has been proven to significantly increase student learning activities in the cooperative learning model (Masyhudi, 2023).
- b. The interview guidelines were used to obtain more in-depth information about students' learning difficulties, learning experiences during learning, and

students' responses to the application of the *Team Games Tournament* (TGT) type cooperative learning model. Interviews were also conducted with teachers to obtain information about the learning conditions and development of students during the study, as well as to several students to find out the difficulties experienced during learning, responses to the application of the TGT model, and changes felt after participating in learning. The interview data was used to complement and strengthen the data obtained through observation. The use of interview techniques in TGT cooperative learning research is also commonly used to dig deep into data related to the experiences of students and teachers during the learning process, as well as to strengthen observational data through triangulation of sources and methods (Nurhuda & Trisiana, 2024). In addition, other research shows that interviews are an important part of TGT-based classroom action research to understand student responses, learning constraints, and the effectiveness of implementing learning models in improving participant engagement and learning outcomes.

- c. Learning outcome tests are used to measure students' cognitive abilities after participating in the learning process. The test given is in the form of 5 multiple-choice questions arranged based on the Mathematics learning indicators that have been determined. The test results were used to determine the level of mastery of the material and the improvement of students' cognitive abilities after the implementation of the TGT learning model. The use of multiple-choice learning outcome tests in cooperative learning research is also widely used to measure students' cognitive achievement after the application of learning models, including TGT, because it is able to provide an objective picture of conceptual mastery and differences in learning outcomes before and after treatment (Nadrah, 2023). In addition, other research shows that multiple-choice test instruments are effectively used in measuring students' cognitive learning outcomes in Teams Games Tournament-based learning, because they can measure conceptual understanding in a structured and quantitative manner after the learning process has taken place.

d. Documentation sheets are used to collect data to support research, such as photos of learning activities, student worksheets (LKPD), student attendance lists, learning evaluation results, and other documents related to the implementation of research. Documentation data is used to complement and reinforce data obtained through observation, interviews, and tests. The use of documentation in educational research serves as a data triangulation technique to increase the validity of research results, because documentation can strengthen evidence from observation, interview, and learning outcome tests data in classroom action research and research (Asogwa et al., 2023). In addition, documentation techniques are also commonly used in educational research to support qualitative and quantitative data analysis through the collection of physical evidence such as photographs, student grades, and relevant learning documents, thereby increasing the validity and credibility of research results.

The research instrument was first tested for validity using *Pearson's Product Moment correlation* with the help of *SPSS* on 29 respondents. At a significance level of 5%, the table r value of 0.367 was obtained. The results of the validity test showed that all items on the instrument determining the probability scale had an r-value of between 0.605–0.758, while all items on the instrument understood the probability had an r-value between 0.465–0.623. Because the entire value of r is calculated to be greater than the r of the table (0.367).

		Correlations					
		SOAL1	SOAL2	SOAL3	SOAL4	SOAL5	TOTAL
SOAL1	Pearson Correlation	1	.355	.442*	.317	.462*	.758**
	Sig. (2-tailed)		.059	.016	.093	.012	.000
	N	29	29	29	29	29	29
SOAL2	Pearson Correlation	.355	1	.557**	.215	.322	.706**
	Sig. (2-tailed)	.059		.002	.263	.088	.000
	N	29	29	29	29	29	29
SOAL3	Pearson Correlation	.442*	.557**	1	.178	.215	.675**
	Sig. (2-tailed)	.016	.002		.356	.263	.000
	N	29	29	29	29	29	29
SOAL4	Pearson Correlation	.317	.215	.178	1	.361	.605**
	Sig. (2-tailed)	.093	.263	.356		.054	.001
	N	29	29	29	29	29	29
SOAL5	Pearson Correlation	.462*	.322	.215	.361	1	.697**
	Sig. (2-tailed)	.012	.088	.263	.054		.000
	N	29	29	29	29	29	29
TOTAL	Pearson Correlation	.758**	.706**	.675**	.605**	.697**	1
	Sig. (2-tailed)	.000	.000	.000	.001	.000	
	N	29	29	29	29	29	29

*, Correlation is significant at the 0.05 level (2-tailed).
 **, Correlation is significant at the 0.01 level (2-tailed).

Figure 2. Results The validity of the instrument determines the scale of the opportunity

		Correlations						
		SOAL1	SOAL2	SOAL3	SOAL4	SOAL5	SOAL6	TOTAL
SOAL1	Pearson Correlation	1	.338	-.025	-.043	.187	.341	.525*
	Sig. (2-tailed)		.085	.900	.833	.351	.082	.005
	N	27	27	27	27	27	27	27
SOAL2	Pearson Correlation	.338	1	.028	.256	.291	-.163	.489*
	Sig. (2-tailed)	.085		.990	.187	.141	.416	.010
	N	27	27	27	27	27	27	27
SOAL3	Pearson Correlation	-.025	.028	1	.239	.282	.080	.500*
	Sig. (2-tailed)	.900	.890		.230	.154	.767	.008
	N	27	27	27	27	27	27	27
SOAL4	Pearson Correlation	-.043	.256	.239	1	.169	.100	.571*
	Sig. (2-tailed)	.833	.187	.230		.401	.820	.062
	N	27	27	27	27	27	27	27
SOAL5	Pearson Correlation	.187	.291	.282	.169	1	.017	.623*
	Sig. (2-tailed)	.351	.141	.154	.401		.933	.001
	N	27	27	27	27	27	27	27
SOAL6	Pearson Correlation	.341	-.163	.080	.100	.017	1	.465
	Sig. (2-tailed)	.082	.416	.767	.820	.933		.014
	N	27	27	27	27	27	27	27
TOTAL	Pearson Correlation	.525*	.489*	.500*	.571*	.623*	.465*	1
	Sig. (2-tailed)	.005	.010	.008	.002	.001	.014	
	N	27	27	27	27	27	27	27

* Correlation is significant at the 0.05 level (2-tailed).

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Figure 3. Instrument validity results understand the opportunity

The reliability of the instrument indicates the level of consistency of the instrument in collecting research data (Masuwai et al., 2024). The reliability of the observation sheet is maintained by using the same observation indicators in each cycle so that the observation results can be carried out consistently. Interview guidelines are used systematically in accordance with the research objectives so that the information obtained remains relevant and consistent. Meanwhile, the reliability of the learning outcome test is considered through the preparation of questions that are in accordance with learning indicators, the use of language that is easy for students to understand, and the suitability of the difficulty level of the questions with the characteristics of grade VI elementary school students. Thus, the instruments used are expected to be able to produce consistent and reliable data.

➔ Reliability

Scale: ALL VARIABLES

Case Processing Summary			
		N	%
Cases	Valid	29	100.0
	Excluded ^a	0	.0
	Total	29	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.773	6

Figure 4. The instrument's reliability results determine the scale of the opportunity

→ **Reliability**

Scale: ALL VARIABLES

Case Processing Summary

		N	%
Cases	Valid	27	100.0
	Excluded ^a	0	.0
	Total	27	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	N of Items
.700	7

Figure 5. Instrument reliability results understand opportunities

The reliability test of the instrument was carried out using Cronbach's Alpha coefficient with the help of SPSS. The results of the analysis showed that the instrument determined the scale of the chance of obtaining Cronbach's Alpha value of 0.773, while the instrument understood the probability of obtaining a value of 0.700. Both values meet the reliability criteria ($\alpha \geq 0.70$), so that all instruments are declared reliable and suitable for use as research data collection tools.

The data analysis technique applied in Cycle I and Cycle II was carried out by calculating the total value of evaluation questions for each cycle using the following formula:

$$\bar{x} = \frac{\sum x}{N}$$

Description :

$\bar{x}$ = Average value

$\sum x$ = Total student scores

N = number of students

The percentage of learning completeness is calculated using the formula:

$$P = \frac{n}{N} \times 100\%$$

Description :

P = Percentage of learning completeness

n = Number of students who have achieved completion

N = total number of students

The success of the actions in this study was determined based on the improvement of students' cognitive abilities in Mathematics subjects after the implementation of the Team Games Tournament (TGT) type cooperative learning model. Students are declared complete if they obtain a minimum score of 70 in accordance with the Learning Goal Achievement Criteria (KKTP) that apply at school. The action is declared successful if at least 80% of the total number of students obtain a score of ≥ 70 and show an increase in activity during the learning process in each cycle.

Table 2. Criteria for completeness of student activity

Percentage	Criteria
81-100%	Very high
61-80%	High
41-60%	Moderate
21-40%	Low
0-20%	Very low

3. Result and Discussion

This classroom action research was carried out in two cycles to improve the cognitive abilities of grade VI students in mathematics subjects through a cooperative learning model of the TGT (Teams Games Tournament) type at SDN Kamayoran 2. In the pre-cycle stage, students are given a pretest in the form of 10 questions to assess their initial abilities before learning using the TGT-type cooperative learning model. This pre-test aims to measure the level of students' cognitive ability or initial understanding as well as identify the difficulties they experience in learning math material, especially on the topic of Opportunities. The initial test (pre-test) was attended by 29 students, only 9 students successfully completed their studies.

This happens due to students' low understanding of the material and lack of motivation to learn. This can be seen from the acquisition of student scores that are still below the set KKTP, which is 70. The pre-test results showed that the lowest

score achieved by students was 30 while the highest score reached 90, with an average class of 54.6%.



Figure 6. Pre-Cycle Completeness Diagram

This data shows that the level of student learning completeness is still in the low category, which is 31.03%. Thus, grade VI students of SDN Kemayoran 2 have not completed their understanding of opportunity material in the subject of Mathematics. Based on these data, learning actions are needed to improve students' cognitive abilities by using a TGT (Teams Games Tournament) type cooperative learning model so that learning becomes more interesting and not monotonous so that it can increase students' motivation and learning outcomes in opportunity materials in mathematics subjects.

After implementing the Team Games Tournament (TGT) type cooperative learning model in Cycle I, the total number of students increased to 12, while the other 17 students have not reached completion with an average class score of 41.37%. Based on the results of data analysis in Cycle I, it was initially concluded that the use of the TGT cooperative learning model has not been able to optimally improve student learning outcomes on the topic of opportunities and opportunity scales.



Figure 7. Cycle I Completion Diagram

The data showed that in cycle I there was a significant increase in learning outcomes compared to the pre-cycle stage. In this first cycle stage, learning completeness increased from 31.03% in the pre-cycle to 41.37% in the first cycle. Students began to show changes in attitudes in learning, such as being more enthusiastic about participating in learning and actively participating in tournaments. However, there are still some students who are not fully understand the material, so that the action is continued to cycle II for further improvement.

In the second cycle, the 29 students were declared to have completed their studies, so that there were no more students who had not completed their studies, with an average class score of 100%. The TGT type cooperative learning model can have a positive influence on students' motivation and understanding so that the results of observations in this second cycle show an increase in terms of student enthusiasm and activeness as well as an increase in students' cognitive abilities in the learning process. Comparisons between post-tests in cycles I and II showed a significant increase in students' understanding, supported by their direct involvement during the learning process and group discussions or peer tutors conducted during the learning process in the second cycle.



Figure 8. Cycle Completion Diagram II

Data showed that in cycle 2, learning outcomes increased significantly compared to cycle 1. This is the result of improving the learning process and improving the quality of the implementation of actions based on the reflection of the previous cycle. This shows that the indicators of learning success have been fully met. This study concludes that the TGT model can create a fun and competitive learning atmosphere and encourage students to learn more and become more active and involved in the learning process (Putra & Jani, 2024).

Based on the results of the research that has been conducted, the application of the Team Games Tournament (TGT) type cooperative learning model in Mathematics learning has been proven to be able to improve the cognitive learning outcomes of grade VI students of SDN Kemayoran 2 Bangkalan. The results of the three stages (pre-cycle, cycle I, cycle II) there was a very significant increase in student learning completeness. The following is a comparison of the learning completeness of grade VI students of SDN Kamayoran 2:

Table 3. Comparison of Pre-Cycle Learning Outcomes, Cycle I, Cycle II

Stages	Completed (Student)	Incomplete (Students)	Completion Percentage
Pre-Cycle	9	20	31,03 %
Cycle I	12	17	41,37 %
Cycle II	29	0	100 %

The bar chart depicting the comparison shows:

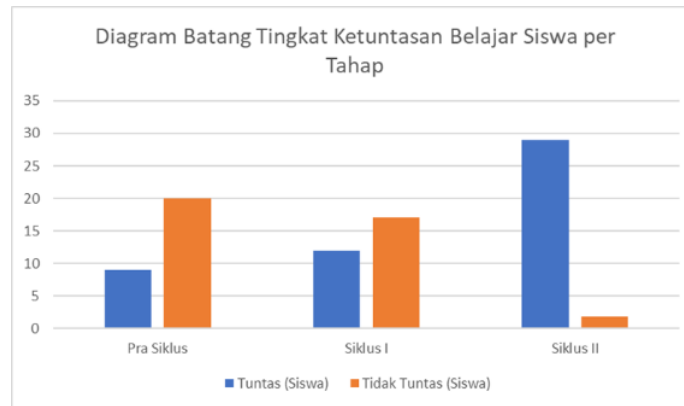


Figure 9. Comparison Diagram of Pre-Cycle Learning Outcomes, Cycle I, Cycle II

The bar chart depicting the comparison shows:

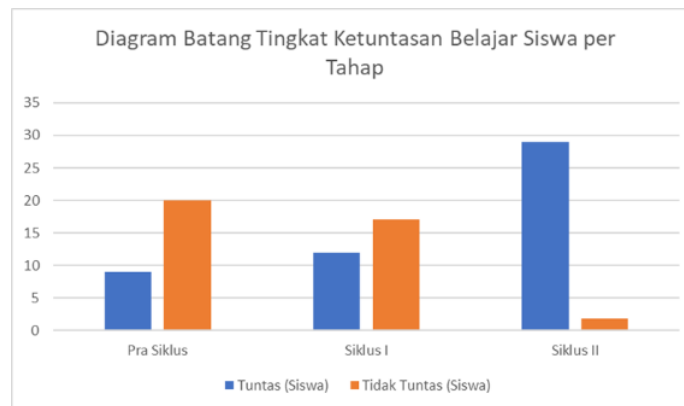


Figure 9. Comparison Diagram of Pre-Cycle Learning Outcomes, Cycle I, Cycle II

The increasing increase in completeness from pre-cycle to cycle II shows that the use of the TGT type cooperative learning model in improving cognitive abilities in opportunity materials is very effective. A fun learning atmosphere makes students more motivated in understanding the material and active in the learning process so that student learning outcomes can be optimal. This research is in line with several previous studies that proved the improvement of students' cognitive

abilities using the TGT-type cooperative learning model. Based on research conducted by Safitri & Syaputri, (2024), research shows that the learning process runs well and experiences an increase in students' cognitive abilities in each cycle, although weaknesses are still found in cycle I which are increasingly improved in cycle II through the application of the Team Games Tournament model. In addition, the research of Agustin et al., (2024), states that the learning model and media that are suitable for overcoming students' low cognitive learning outcomes due to students' low interest in learning are the Teams Games Tournament (TGT) type cooperative learning model. Furthermore, according to the research of Qothrunnada & Sutriyani, (2025) the application of the TGT model assisted by game media can significantly improve the mathematics learning outcomes of elementary school students. In addition, research by (Darizah & Handayani, (2026), shows that the TGT-type cooperative learning model has a positive impact on the mathematics learning outcomes of junior high school students through group cooperation and healthy competition. In line with the research of Nurhanifah & Dewi, (2024), also stated that the application of the Teams Games Tournament (TGT) type cooperative learning model was able to improve mathematics learning outcomes for grade III students. Mathematics is one of the subjects that appears at every level or level of education as a science that is very important for various aspects of life through logical and systematic thinking (Julianawati & Darmawan, 2025). One of the materials in mathematics is opportunity used in decision-making theory to deal with uncertainty in situations (Nurhaswinda et al., 2026). Therefore, the Teams Games Tournament type cooperative learning model was chosen because it has been proven to be effective in improving student learning outcomes through healthy cooperation and competition (Aisyah et al., 2025). TGT type cooperative learning can make students enthusiastic about learning. The existence of games in learning makes students enthusiastic, so students are enthusiastic about learning because of their enthusiasm to win games and tournaments. In addition, students not only gain knowledge from teachers, but also learn through interaction with peers in groups while participating in games and tournaments, where each group must compete to understand each other's subject matter in order to answer questions in games and

tournaments (Khairunnisa et al., 2026). According to Untari et al., (2025), the advantages of the Teams Games Tournament (TGT) learning model:

a. Cultivate an Attitude of Respect for Others

The implementation of the TGT learning model of students shows a good mutual respect. This can be seen from the way students respect the teacher when delivering material and respect the opinions of friends when game and tournament activities take place.

b. Increasing Students' Enthusiasm for Learning

The application of the TGT learning model is able to increase students' enthusiasm for learning. The enthusiasm of the students can be seen from their activeness in participating in learning, the ability to respond well to the teacher's questions, obeying directions during the activity, and actively participating in games and tournaments.

c. Building and Expanding Students' Knowledge

Through TGT learning, students can build and expand knowledge independently. In this learning process, teachers play the role of facilitators, while students are encouraged to actively seek, understand, and develop their own knowledge.

d. Fostering an Attitude of Cooperation

The TGT learning model is able to foster an attitude of cooperation between students. During group activities, games, and tournaments, students can work well together without conflicts due to differences in characteristics and backgrounds. The learning activities went smoothly and showed the development of tolerance among students.

e. Fostering an Attitude of Tolerance

The application of the learning model is able to foster an attitude of tolerance between students. Teachers form groups in a heterogeneous manner so that students can learn to appreciate and accept the different characteristics of each group member. Through these activities, students show mutual respect and tolerance during the learning process.

According to Simbolon et al., (2025), the disadvantages of the Teams Games Tournament (TGT) type cooperative learning model include the following.

- a. In the learning process, not all students actively participate or express their opinions during the activity.
- b. The implementation of TGT learning takes quite a lot of time so that sometimes the learning time feels inadequate.
- c. The classroom atmosphere can become crowded or less conducive if the teacher is not able to manage the class properly during the learning activities.

Before implementation, many students still had difficulty understanding mathematical concepts due to a lack of interest in learning and conventional teaching models. After using the TGT (Teams Games Tournament) type cooperative learning model, students experience cognitive improvement because of this TGT type learning cooperative model, because this model provides interactive and interesting learning. This makes students more enthusiastic in learning mathematics because through TGT they succeed in creating a more fun and interactive learning atmosphere. Students are not only focused on cognitive achievement, but are also developed in social aspects such as the ability to work together, communicate, and responsibility in groups (Sembiring et al., 2025).

4. Conclusion

1. Based on the analysis of the data that has been carried out, the researcher drew several conclusions as follows:
2. The learning outcomes of grade VI students at SDN Kemayoran 2 in the subject of Mathematics, opportunity scale material and comparing dice and coin opportunities before using the TGT model were very low. Of the 29 students, the average score obtained during the pretest was 54.6%, only 9 students met the criteria for achieving the learning objectives that had been determined.
3. Student learning outcomes in mathematics showed an increase after the implementation of the Team Games Tournament (TGT) type cooperative

learning model. In the first cycle, the percentage of student learning completeness reached 41.37%, with 12 students declared complete and 17 other students not yet complete. Furthermore, in the second cycle there was a significant increase with a completeness rate reaching 100% and all 29 students were declared complete.

4. The use of the TGT type cooperative model makes students more enthusiastic and enthusiastic in the learning process compared to the previous learning process, thus having an impact on improving the learning outcomes obtained by students to be better.

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