Jurnal PAJAR (Pendidikan dan Pengajaran)
Volume 9 Nomor 6 November 2025 | ISSN Cetak : 2580 - 8435 | ISSN Online : 2614 - 1337
DOI : http://dx.doi.org/10.33578/pjr.v9i6.297

The Effect of the TGT Cooperative Learning Model Assisted by Snakes and Ladders on the Mathematics Learning Outcomes of Second Grade Students

Jenemy Amelya Damanik[1], Regina Sipayung[1], Darinda Sofia Tanjung[1], Rumiris Lumban Gaol[1], Irmina Pinem[1], Viji Rajesh[2]

[1] PGSD, FKIP, Universitas Katolik Santo Thomas, Medan, Indonesia
[2] Department of Earth and Space Sciences, Indian Institute of Space Science and Technology, India
jejedamanik918@gmail.com, reginasipayung@gmail.com, darinda_tanjung@ust.ac.id, rumiris20lumbangaol@gmail.com, irminapinem.ip@gmail.com, drvijiprof@gmail.com
corresponding author: *jejedamanik918@gmail.com*

ABSTRACT

This research aims to determine the effect of variable X, namely the TGT cooperative learning model assisted by a snakes and ladders game, on variable Y, namely the mathematics learning outcomes of second-grade students at SD Negeri 104276 Pulau Tagor in the 2024/2025 academic year. The background of this study is the low learning outcomes of students in multiplication material due to the dominance of the lecture method and the lack of use of interesting learning media. The method used is the experimental method with a One Group Pretest-Posttest Design. There were 28 students as research subjects. The instrument used was a learning outcome test to determine the changes before and after the treatment. The pretest results showed that the average student score was 59.57 with a mastery level of only 39.28% or 11 out of 28 students. After implementing the TGT learning model assisted by snakes and ladders, the posttest results increased significantly with an average score of 81.25 and a mastery level of 89.29% or 25 out of 28 students. Thus, there was an increase in learning mastery of 50.01%. Based on the results of the research calculations, it shows that there is an effect of the Team Games Tournament Cooperative Learning Model Assisted by a Snake and Ladder Board Game on the mathematics learning outcomes of Grade II students at SD Negeri 104276 Pulau Tagor in the 2024/ 2025, where rhitung ≥ rtabel, namely 0.927 ≥ 0.373, there is a high effect, and thitung ≥ ttabel, where thitung 6.518 ≥ ttabel 2.064 at a significance level of α = 0.05. Thus, Ha is accepted and Ho is rejected. Therefore, it can be concluded that there is a significant effect between the use of the TGT cooperative learning model assisted by snakes and ladders (variable X) on improving students' mathematics learning outcomes (variable Y).

Keywords*: *TGT , snake and ladder, learning outcomes, mathematics, cooperative learning model

Submitted	Accepted	Published
12 August 2025	05 November 2025	21 November 2025

Citation	:	Damanik, J.A., Sipayung, R., Tanjung, D.S., Gaol, R.L., Pinem, I., & Rajesh, V. (2025). The Effect of the TGT Cooperative Learning Model Assisted by Snakes and Ladders on the Mathematics Learning Outcomes of Second Grade Students. *Jurnal PAJAR (Pendidikan dan Pengajaran)*, *9*(6), 739-751. DOI: http://dx.doi.org/10.33578/pjr.v9i6.297.

INTRODUCTION

Education is a fundamental aspect of developing quality human resources, with its strategic role evident from the early stages of basic education. At this stage, students are introduced to various fields of study aimed at developing logical, systematic, and critical thinking skills. One subject that plays an important role in developing these competencies is mathematics. More than just arithmetic skills, mathematics contributes to training problem-solving abilities, deductive-inductive reasoning, and rational decision-making in various situations. However, various studies and field observations show that mathematics remains a challenge for most students at the elementary school level. Mathematics is often perceived as a difficult, boring, and irrelevant subject, especially in topics such as multiplication. This issue is also identified at SD Negeri 104276 Pulau Tagor, where initial observations show that only 11 out of 28 second-grade students (39.28%) achieved mastery in multiplication. This condition indicates a low level of student understanding of the concepts taught. The main factors influencing the low learning outcomes include the use of conventional teaching methods, such as lectures and mechanistic individual assignments.

Jurnal PAJAR (Pendidikan dan Pengajaran)
Volume 9 Nomor 6 November 2025 | ISSN Cetak : 2580 - 8435 | ISSN Online : 2614 - 1337
DOI : http://dx.doi.org/10.33578/pjr.v9i6.297

This approach is unable to accommodate the diverse learning needs of students and does not encourage active student engagement in the learning process. In addition, the lack of varied and interactive learning media contributes to low student interest and motivation to learn. In response to these issues, innovation is needed in learning strategies that are not only focused on cognitive learning outcomes but also consider the affective and psychomotor aspects of learners. One relevant approach that aligns with the characteristics of elementary school students is the cooperative learning model known as Team Games Tournament (TGT). The TGT model is a form of cooperative learning developed by Slavin (2008), which combines elements of group cooperation and academic competition in a fun atmosphere. Through this model, students are divided into heterogeneous groups to learn together, then compete in a tournament format with a scoring system, thereby creating intrinsic and extrinsic motivation in the learning process.

To enhance the effectiveness of implementing the TGT model, appropriate educational media tailored to children's world is required. Educational games like modified snakes and ladders incorporating mathematics learning materials are a suitable alternative. This game is not only visually appealing but also fosters a fun learning atmosphere and encourages active student engagement. As explained by Sadiman, et al. (2021:78), learning media plays an important role in conveying information and building meaningful learning experiences through various visual, audio, and kinesthetic forms. Based on this description, this study aims to examine the effect of implementing the Team Games Tournament (TGT) cooperative learning model, assisted by a snakes and ladders game, on the mathematics learning outcomes of second-grade students at SD Negeri 104276 Pulau Tagor. It is hoped that the results of this study will contribute theoretically and practically to efforts to improve the quality of mathematics learning at the elementary school level through the application of active, collaborative, and enjoyable learning strategies.

LITERATURE REVIEW

Learning is an effort or process undertaken by an individual to achieve changes in behavior, whether in terms of skills, knowledge, attitudes, or positive values. These changes occur as a result of experiences with material that has been studied, observed, analyzed, and practiced. The learning process can influence a person's thoughts, thereby causing changes in behavior before and after learning. In Skinner's learning theory, learning is a process of progressive adaptation or adjustment of behavior. Learning is also understood as a behavior, where when a person learns, their response becomes better. Jean Piaget stated that the learning process occurs when an individual interacts with their social and physical environment. According to Slameto (2020:7), learning is a process undertaken by an individual to achieve a new behavioral change as a result of their own experiences in interacting with their environment. Rosnawati (2020:6) states that learning is an activity carried out consciously or unconsciously by every individual, resulting in changes, such as from not knowing to knowing, from not being able to walk to being able to walk, and from not being able to read to being able to read. Learning is not limited to academic aspects, but also includes various skills and experiences gained through interaction with the surrounding environment. This process can occur through formal learning at school, daily experiences, or the results of observation and direct practice.

Learning outcomes describe observable and measurable changes in behavior, including aspects of knowledge, attitude, and skills. In addition, learning outcomes are not limited to academic achievement, but also include the development of students' attitudes, morals, and ethics. Supit (2023:699) states, "Learning outcomes are the competencies acquired by students after participating in the learning process, which demonstrate their level of understanding and mastery of the material. These outcomes are evident in various aspects, such as academic grades, conceptual understanding, cognitive, motor, and social skills, changes in attitude and behavior, problem-solving abilities, and active participation in discussions and learning activities. The same point is made by Amelia (2023:595), who states that learning outcomes are achievements obtained by students during the learning process, which are not only demonstrated through grades but also through behavioral changes. These changes include improved understanding, skills, and positive attitudes. Learning outcomes are typically measured using letters, numbers, or descriptions that reflect students' achievement of

Jurnal PAJAR (Pendidikan dan Pengajaran)
Volume 9 Nomor 6 November 2025 | ISSN Cetak : 2580 - 8435 | ISSN Online : 2614 - 1337
DOI : http://dx.doi.org/10.33578/pjr.v9i6.297

learning objectives. Overall, learning outcomes indicate the success of learning in developing students' cognitive, affective, and psychomotor aspects.

Supported by Rahman's (2021:11) opinion, learning outcomes are students' achievements after participating in the learning process, encompassing knowledge, skills, and attitudes. These achievements are seen in the understanding of the material, practical abilities, and behavioral changes. Evaluations are conducted through tests, assignments, projects, or observations to measure the extent to which learning objectives have been achieved. Learning outcomes are important indicators in assessing the effectiveness of learning and the role of teachers in guiding students.

Team Game Tournament (TGT) Cooperative Learning

Team game tournament cooperative learning is a model that divides students into small heterogeneous groups and combines teamwork with competition through academic tournaments in the form of quizzes or games. According to Fashikhah (in Slavin 2022:5), cooperative learning of the TGT type is one of the most widely researched learning methods, which is very easy to implement, involves the activities of all students without any status differences, and contains game elements. In line with Merti's (2020:3) opinion, the Team Games Tournament (TGT) learning model is a form of academic tournament involving quizzes to measure individual student progress through a scoring system. In this model, students compete on behalf of their respective groups against members of other groups with balanced initial ability levels.

This is reinforced by Hermawan (2020:3), who states that the cooperative learning model of the TGT type involves forming groups by dividing students into small groups of four to six members, with diversity in terms of academic ability, gender, race, or ethnicity. Another opinion is expressed by Tarigan (2024:3), who states that the cooperative learning model of the Teams Games Tournament (TGT) type is easy to implement, involves the active participation of all students without distinguishing status, encourages the role of peer tutors, and contains elements of play and reinforcement. In line with the opinion of Malau et al. (2024:2), the Team Game Tournament is a learning model that emphasizes teamwork in a competitive environment, where students participate in quiz-based tournaments to improve their understanding and cognitive skills.

Steps in the Team Games Tournament Cooperative Learning Model

The implementation of a learning model requires systematic and organized steps so that the process can run optimally. Similarly, in using the Teams Games Tournament (TGT) cooperative learning model, there are certain steps that must be followed. According to Fashikhah (2022:5), there are four main components in the TGT steps: (1) Class Presentation, where students are introduced to the presentation in the classroom. (2) Teams, where the teacher forms several teams and ensures that students are truly engaged in learning. (3) Games, where the teacher creates games consisting of questions designed to test students' knowledge. (4) Tournament, which is the structure where the game takes place, where students switch tables to assess their performance in completing tasks.

Supported by the opinion of Zahra et al. (in Trianto 2023:3), who state, "The steps of the Teams Games Tournaments (TGT) learning method are (1) Group Formation: Students are divided into heterogeneous groups of 4 people, then given an explanation of the material and activity mechanisms. (2) Tournament Preparation: Tournament tables are arranged with students of similar ability based on group agreements. (3) Tournament: Students complete problems within a certain time, are assessed, and awarded titles based on their scores. (4) Table Rotation: Students move tables based on the titles they have earned. (5) Assessment: Individual and group scores are calculated, and awards are given.

In line with the opinions of Syaripatul and Jamilah (Slavin 2023:196), they state (1) Classroom Presentation, TGT material is delivered through classroom presentations, either directly by the teacher or through discussions or audiovisual media. (2) Team, Consisting of 4–5 students representing the diversity of the class. The team's main task is to ensure that all members understand the material to prepare for the quiz.

Jurnal PAJAR (Pendidikan dan Pengajaran)
Volume 9 Nomor 6 November 2025 | ISSN Cetak : 2580 - 8435 | ISSN Online : 2614 - 1337
DOI : http://dx.doi.org/10.33578/pjr.v9i6.297

(3) Academic Game, which includes relevant questions to assess students' understanding of the presentation and teamwork. (4) Tournament, the structure of the game's implementation, typically held at the end of the week or unit after the presentation and teamwork are completed. (5) Team Recognition, where the team receives a certificate or award if the average score meets the criteria. This score can also influence 20% of the student's grade.

METHOD

This study used a quantitative approach with an experimental method and a One Group Pretest-Posttest Design to determine the effect of the Team Games Tournament (TGT) cooperative learning model assisted by snakes and ladders media on students' mathematics learning outcomes. The study was conducted at SD Negeri 104276 Pulau Tagor during the second semester of the 2024/2025 academic year, with a sample of 28 second-grade students. The research instruments consisted of achievement tests in the form of pretest and posttest to measure students' understanding improvement, questionnaires to determine students' responses to learning, observation sheets to record activities during the learning process, and documentation as supporting data. All instruments underwent validity and reliability tests before use. Data were analyzed quantitatively by calculating the average score, completion rate, and followed by a normality test using the Liliefors test. Hypothesis testing was conducted using a paired sample t-test to determine significant differences in learning outcomes before and after the intervention. The criteria for learning completion in this study were set based on the KKTP score.

RESULTS AND DISCUSSION

School Data Description

This study was conducted in class II of SD Negeri 104672 Pulau Tagor, located in Kec.Serba Jadi Kab, Serdang Bedagai Prov.Sumatera Utara. This study was conducted to determine the extent of the influence of the Team Game Tournament learning model assisted by Snakes and Ladders on student learning outcomes. SD Negeri 104276 Pulau Tagor has facilities that support the teaching and learning process quite comprehensively. The school has 1 principal's office, 1 teachers' room, 3 school bathrooms consisting of 1 teachers' bathroom and 2 students' bathrooms, and 6 classrooms/student learning rooms and a library room.

This study is an experimental study with a one-group pretest-posttest design involving one class. Data collection was conducted using test questions and questionnaires. Before collecting data from the research sample, the first step the researcher took was to conduct a pilot test of the questions at another school, namely SD Negeri 067259 Medan Johor, which consists of 20 students. Out of 30 questions, 20 were deemed valid, and out of 30 questionnaires, 20 were valid. After obtaining valid results, the questions were then distributed to the respondents at the research school, namely SD Negeri 104276 Pulau Tagor, Grade II, with 28 students in the 2024/2025 academic year.

Class II Post-test Results

In the final stage of the learning process, all material was delivered using the Team Game Tournament learning model assisted by snakes and ladders. After implementing this model, the researcher conducted a post-test to evaluate the effectiveness of the measures that had been taken. The post-test data for second-grade students is presented in the following table.

Jurnal PAJAR (Pendidikan dan Pengajaran)
Volume 9 Nomor 6 November 2025 | ISSN Cetak : 2580 - 8435 | ISSN Online : 2614 - 1337
DOI : http://dx.doi.org/10.33578/pjr.v9i6.297

Table 1. Class II Post-test Results

No	Student Name	KKTP	Score	Description
1	Alif	70	60	Needs Improvement
2	Alpin	70	70	Needs Improvement
3	Andre	70	75	Highly Developed
4	Azis	70	60	Highly Developed
5	Azizah	70	70	Highly Developed
6	Boy	70	70	Highly Developed
7	Briyan	70	75	Highly Developed
8	Distra	70	70	Highly Developed
9	Dita	70	75	Highly Developed
10	Edo	70	80	Highly Developed
11	Esa	70	75	Highly Developed
12	Ferdi	70	80	Highly Developed
13	Lidia	70	75	Highly Developed
14	Mikaila	70	80	Highly Developed
15	Murni	70	70	Highly Developed
16	Naeema	70	80	Highly Developed
17	Najla Anisa	70	85	Highly Developed
18	Natan	70	75	Highly Developed
19	Phika	70	85	Highly Developed
20	Sela	70	100	Highly Developed
21	Silvia	70	85	Highly Developed
22	Siti Zahro	70	90	Highly Developed
23	Tiona	70	100	Highly Developed
24	Yana	70	90	Highly Developed
25	Yasira	70	95	Highly Developed
26	Zea	70	95	Highly Developed
27	Hedric	70	85	Highly Developed
28	Zidan	70	80	Highly Developed
	Total		**2240**	
	Average		**80**	

From the table above, it can be seen that the students' learning outcomes in understanding multiplication material show an average post-test score of 80 for second-grade students. Since this score is above the minimum passing grade of 70, it can be concluded that 26 students are in the "highly developed" category and 2 students are in the "needs improvement" category. For more details, the post- test results for second-grade students can be seen in the following summary frequency table:

Jurnal PAJAR (Pendidikan dan Pengajaran)
Volume 9 Nomor 6 November 2025 | ISSN Cetak : 2580 - 8435 | ISSN Online : 2614 - 1337
DOI : http://dx.doi.org/10.33578/pjr.v9i6.297

Table 2. Frequency Distribution of Post-Test Data

X	F	FX	X=x-x	X2	FX2
60	2	120	-20	3600	14400
70	4	280	-10	4900	78400
75	7	525	-5	5625	275625
80	5	400	0	6400	160000
85	3	255	5	7225	65025
90	3	270	10	8100	72900
95	2	190	15	9025	36100
100	2	200	20	10000	40000
Total	**∑28**	**∑FX=2240**	-	**∑X^2 =54875**	**∑FX^2=742450**

From the data above, the mean, standard deviation, and standard error can be calculated as follows:

1. *Mean*

$$M_x = \frac{\sum fx}{n}$$

$$M_x = \frac{2240}{28}$$

$$M_x = 80$$

2. Standar deviasi (SD)

$$SD = \sqrt{\frac{\sum fx^2}{n}}$$

$$SD = \sqrt{\frac{742450}{28}}$$

$$SD = \sqrt{26.516,07}$$

$$SD = 162,83$$

3. Standar error

$$SE_M = \frac{SD}{\sqrt{N-1}}$$

$$SE_M = \frac{162,83}{\sqrt{28-1}}$$

$$SE_M = \frac{162,83}{\sqrt{27}}$$

Jurnal PAJAR (Pendidikan dan Pengajaran)
Volume 9 Nomor 6 November 2025 | ISSN Cetak : 2580 - 8435 | ISSN Online : 2614 - 1337
DOI : http://dx.doi.org/10.33578/pjr.v9i6.297

Table 3. Frequency Distribution of Post-test Results

Score	Frequency	Percentage	Description
60-67	2	7%	Needs Improvement
68-75	11	39%	Highly Developed
76-83	5	18%	Highly Developed
84-91	6	21%	Highly Developed
92-100	4	14%	Highly Developed

Based on the percentage distribution table of the pretest scores above, there were 2 respondents with scores of 60-67 (7%), 11 respondents with scores of 68-75 (39%), 5 respondents with scores of 76-83 (18%), 6 respondents with scores of 84-91 (21%), and 4 respondents with scores of 92-100 (14%). For further clarification, please refer to the following histogram:

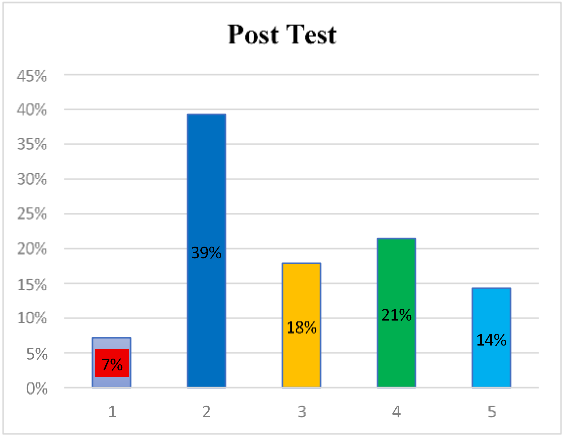

Figure 1. Post-test Frequency Diagram

Based on the frequency distribution diagram above, the posttest scores for Class II showed the highest score of 100 and the lowest score of 60. The mean was 80, with a standard deviation of 162.83 and a standard error of 31.33. Out of 28 students, 26 achieved scores above the KKTP, while 2 students scored below the KKTP. Thus, this study demonstrated an improvement in student learning outcomes following the implementation of the treatment using the team game tournament learning model assisted by a snakes and ladders game.

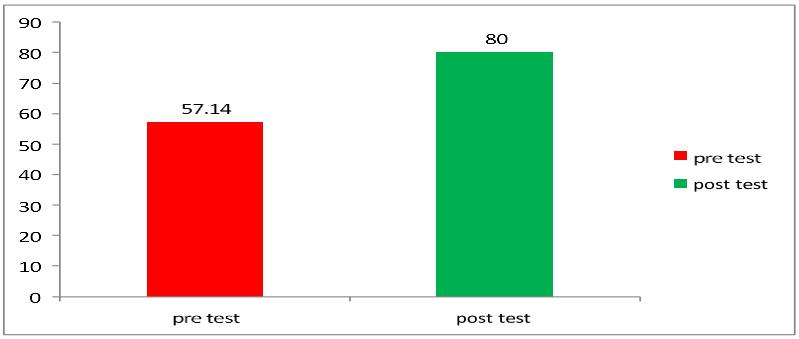

Figure 2. Diagram of Average Pretest and Posttest Scores for Grade II

Jurnal PAJAR (Pendidikan dan Pengajaran)
Volume 9 Nomor 6 November 2025 | ISSN Cetak : 2580 - 8435 | ISSN Online : 2614 - 1337
DOI : http://dx.doi.org/10.33578/pjr.v9i6.297

Based on the diagram in Figure 2, it can be concluded that the average pretest score of students was 57.14, while after being given treatment using the snake and ladder-assisted game tournament learning model, the students' scores were influenced with an average of 80.

Correlation Coefficient Test

The correlation coefficient test was conducted to determine whether there was an influence between the independent variable (X) and the dependent variable (Y). The requirement for the correlation coefficient test was to see whether t_count > t_table using the product moment correlation formula. The researcher performed the correlation coefficient test manually using Microsoft Excel and SPSS version 26. Table 4 shows the correlation coefficient calculations using Microsoft Excel.

Table 4. Correlation Coefficient Results

X	Y	XY	Y^2	X^2
25	60	1500	3600	625
30	60	1800	3600	900
35	70	2450	4900	1225
35	70	2450	4900	1225
40	70	2800	4900	1600
45	70	3150	4900	2025
45	75	3375	5625	2025
50	75	3750	5625	2500
55	75	4125	5625	3025
55	75	4125	5625	3025
55	75	4125	5625	3025
55	75	4125	5625	3025
60	75	4500	5625	3600
60	80	4800	6400	3600
60	80	4800	6400	3600
65	80	5200	6400	4225
65	80	5200	6400	4225
65	80	5200	6400	4225
65	85	5525	7225	4225
65	85	5525	7225	4225
65	85	5525	7225	4225
65	90	5850	8100	4225
65	90	5850	8100	4225
70	90	6300	8100	4900
70	95	6650	9025	4900
75	95	7125	9025	5625
75	100	7500	10000	5625
85	100	8500	10000	7225
∑=1600	∑=2240	∑=131825	∑=182200	∑=97100

Jurnal PAJAR (Pendidikan dan Pengajaran)
Volume 9 Nomor 6 November 2025 | ISSN Cetak : 2580 - 8435 | ISSN Online : 2614 - 1337
DOI : http://dx.doi.org/10.33578/pjr.v9i6.297

The following is the calculation of the correlation coefficient test using SPSS version 26, which can be seen in Table 4. It is as follows:

Table 5. Correlation Coefficient Test

Correlations

		Model	Learning Outcomes
Model	*Pearson Correlation*	1	.927**
	Sig. (2-tailed)		.000
	N	28	28
Learning Outcomes	*Pearson Correlation*	.927**	1
	Sig. (2-tailed)	.000	
	N	28	28

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

Next, the correlation coefficient was calculated using SPSS version 26. Based on the results, the correlation coefficient (r_xy) or r_count = 0.927 was obtained with a significance level of 5% and a number of respondents (n) = 28 students, resulting in r_table = 0.373. From these calculations, it can be seen that 0.927

≥ 0.388, so it can be concluded that there is an influence between the cooperative learning model of the team game tournament type assisted by snakes and ladders on the learning outcomes of second-grade students at SD Negeri 104276 Pulau Tagor.

Based on Table 4.13, the correlation coefficient (r_xy) value of 0.927 falls within the range of 0.80– 1.000, indicating that there is a very strong relationship between the cooperative learning model of the team game tournament type assisted by snakes and ladders and student learning outcomes. The calculated learning outcome of 0.927 means that r_calculated ≥ r_table, i.e., 0.927 ≥ 0.388, so the learning model provided by the researcher is highly effective for supporting the learning process at 92.7% of 100%, meaning the ineffectiveness of the model used is 7.3% of 100%. Thus, it can be concluded that the relationship between the learning model and student learning outcomes is very significant in the learning process.

Discussion of Research Results

This study was conducted at SD Negeri 104276 Pulau Tagor, located in Serba Jadi District, Serdang Bedagai Regency, North Sumatra. The researcher used tests, questionnaires, and documentation as data collection tools with a sample size of 28 students. The purpose of this study was to determine how the learning process using the Cooperative Learning Model Type Team Games Tournament Assisted by Snakes and Ladders in Mathematics lessons, and to determine the extent of the influence of using the Cooperative Learning Model Type Team Games Tournament Assisted by Snakes and Ladders on student learning outcomes in Mathematics lessons for Grade II at SD Negeri 104276 Pulau Tagor. Based on the research results, the following findings were obtained.

Jurnal PAJAR (Pendidikan dan Pengajaran)
Volume 9 Nomor 6 November 2025 | ISSN Cetak : 2580 - 8435 | ISSN Online : 2614 - 1337
DOI : http://dx.doi.org/10.33578/pjr.v9i6.297

a. The implementation process using the TGT (team game tournament) cooperative learning model assisted by snakes and ladders in mathematics lessons.

In this lesson, educators apply a contextual approach by presenting real-life problems that are relevant to the daily lives of students. Learning media such as “snakes and ladders” are used as tools to facilitate students' understanding of the concept of multiplication through repeated addition. Based on the results of the questionnaire distributed, the majority of students showed interest in the use of learning media, as it was considered more enjoyable, concrete, and able to enhance conceptual understanding. Furthermore, a correlation analysis was conducted to determine the relationship between the use of learning media and students' understanding of the material.

In the correlation test, the calculated value rhitung = 0.927 > rtabel 0.388, indicating a very strong correlation. Additionally, in the t-test, the calculated value thitung = 12.610 > ttabel = 2.056, indicating that the alternative hypothesis (Ha) is accepted (there is a significant effect of the TGT cooperative learning model assisted by snakes and ladders on learning outcomes).

The research results indicate that the use of the TGT cooperative learning model assisted by snakes and ladders can significantly improve student learning outcomes. This is in line with the opinion of Sihotang and Sukmawati (2023:2) that the TGT cooperative learning model assisted by snakes and ladders can influence students to be more active in mathematics learning, making it easier for them to understand multiplication as repeated addition. This is in line with the principle stated by Merti (2020:3), that the TGT cooperative learning model can encourage students to learn through teamwork, which can motivate students to be more active in learning.

b. Student learning outcomes by applying the TGT (Team Game Tournament) cooperative learning model assisted by snakes and ladders in mathematics lessons.

The research design used was a One Group Pretest-Posttest Design. The results of the study showed that in the pretest, the average score was 57, with 11 out of 28 students (39.28%) achieving mastery, while 17 out of 28 students (60.72%) did not achieve mastery. The posttest results showed an average score of 80, with 25 out of 28 students (89.29%) achieving learning mastery, while 3 students (10.71%) did not achieve mastery. The correlation test yielded rhitung = 0.927 > rtabel = 0.388, indicating a very strong relationship between the learning model and student learning outcomes. In the t-test, the calculated t-value was 12.610 > t-table 2.056, meaning that Ha was accepted, indicating that there was a significant effect of the TGT cooperative model assisted by snakes and ladders on student learning outcomes.

The TGT cooperative learning model is a model that involves all students without distinction and contains elements of play. In this study, the researcher used the snake and ladder game as a medium to convey the concept of multiplication as repeated addition. The steps of the TGT cooperative learning model assisted by the snake and ladder game, based on Fashikhah's theory (Slavin 2022:5), include classroom presentation, the teacher forming small groups, students playing the game, and students completing tasks and presenting them. Afandi (2020:7) states that the cooperative learning model of the tgt type assisted by snakes and ladders can train students' competitiveness and sportsmanship, as well as train students to work together because they do not play and learn alone but as a team. Learning outcomes increased significantly after the implementation of the cooperative learning model of the tgt type assisted by snakes and ladders. The average score increased from 57 to 80, representing a 40.35% improvement.

Jurnal PAJAR (Pendidikan dan Pengajaran)
Volume 9 Nomor 6 November 2025 | ISSN Cetak : 2580 - 8435 | ISSN Online : 2614 - 1337
DOI : http://dx.doi.org/10.33578/pjr.v9i6.297

c. The effect of the TGT (team game tournament) cooperative learning model assisted by snakes and ladders on mathematics subjects.

This study used a One Group Pretest-Posttest design to measure the effect of the TGT cooperative learning model assisted by snakes and ladders on student learning outcomes in multiplication operations.

1. Pretest results showed an average score of 57, with only 11 out of 28 students achieving mastery (KKTP). The majority of students were in the category of needing improvement.
2. The posttest results showed an average score of 80, with 25 out of 28 students achieving mastery (KKTP). There was a significant increase from the pretest average score.
3. Statistical Analysis, the correlation coefficient is rhitung: 0.927, indicating a very strong relationship between the influence of the cooperative learning model type tgt assisted by snakes and ladders and learning outcomes. t-test: t-calculated = 12.610 > t-table = 2.056, meaning there is a significant effect of the cooperative learning model of the TGT type assisted by a snakes and ladders game on students' learning outcomes.

The cooperative learning model of the tgt type assisted by snakes and ladders according to Fashikhah (2022:5) is a model that divides students into small heterogeneous groups, combining teamwork with competition through academic tournaments in the form of quizzes or games. This makes it easier for students to understand the material taught by the teacher. Siti (in Shoimin 2023:197) states that the cooperative learning model of the TGT type assisted by snakes and ladders encourages both intelligent and less capable students to be equally active and play a role in the group, fostering togetherness and mutual respect, increasing enthusiasm for learning due to group rewards, and making learning more enjoyable through games and tournaments.

The results of this study indicate that learning using the cooperative learning model of the TGT type assisted by snakes and ladders: increases students' interest and motivation to learn, makes it easier for students to understand the concept of multiplication, and significantly improves learning outcomes. This study aligns with the findings of Sihotang and Sukmawati (2023:3) that the cooperative learning model of the TGT type assisted by a snake ladder is effective in improving elementary school students' mathematics learning outcomes.

Based on the research results and discussion, it can be concluded that the cooperative learning model of the TGT type assisted by snakes and ladders can be effectively applied in mathematics learning in grade II of SDN 104276 Pulau Tagor, particularly in the material on multiplication operations. The application of this model has a significant effect on improving student learning outcomes, as evidenced by the increase in posttest scores and statistical analysis results. The cooperative learning model of the TGT type assisted by snakes and ladders helps students understand concepts concretely, increases student active involvement, and builds independent and meaningful understanding.

CONCLUSIONS AND RECOMMENDATION

Based on the results of research conducted at SD Negeri 104276 Pulau Tagor, it can be concluded that the Team Games Tournament (TGT) cooperative learning model assisted by snakes and ladders games is effective in improving the mathematics learning outcomes of second-grade students. This is evidenced by the increase in the average student score from 59.57 to 81.25 and the increase in the number of students who achieved the Learning Objective Completion Criteria (KKTP) from 39.28% to 89.29%.

The implementation of the TGT model encourages active student involvement in learning through group activities and competitive yet enjoyable tournaments. In addition to increasing learning motivation, this

model also builds cooperation among students, develops peer tutoring roles, and fosters a sense of responsibility in completing tasks together.

The modified snake and ladder game media with mathematical content plays an important role in helping students understand the material concretely and contextually, as well as increasing learning interest because it aligns with the characteristics of elementary school-aged children. Statistical test results show a determination coefficient of 0.927, meaning that 92.7% of the improvement in learning outcomes is directly influenced by the implementation of this learning model. Therefore, the TGT learning model assisted by the snake and ladder game media can be used as an innovative learning strategy alternative capable of creating an active, communicative, and enjoyable learning environment in efforts to improve mathematics learning outcomes at the elementary school level.

REFERENCES

Anisa, dkk (2023). Pengaruh Media Permainan Ular Tangga Terhadap Hasil Belajar dan Pemahaman Konsep Pada Mata Pelajaran Matematika Siswa Kelas IV SDN Lebaksiu Kidul 04. Wawasan Pendidikan, 427– 439.

Arikunto, S. (2023). Prosedur penelitian: suatu pendekatan praktik (14th ed.).J Jakarta PT. Rineka Cipta. Astuti, dkk (2017). Penerapan Model Pembelajaran Teams Games Tournament Untuk Meningkatkan Keaktifan dan Hasil Belajar IPA. Jurnal Ilmiah Sekolah Dasar, 1(3), 155. https://doi.org/10.23887/jisd.v1i3.10471

Ayu, dkk (2022). Implementasi Permainan Ular Tangga Raksasa dalam Mengembangkan Kognitif Anak Usia Dini. In JoECCE Journal of Early Childhood and Character Education (Vol. 2, Issue 1).

Azizah, dkk Pengaruh Permainan Ular Tangga Modifikasi Terhadap Hasil Belajar Matematika Siswa Kelas 1 Di SD Islam Al-Fatih Gondang Tahun Ajaran2023/20241.

Dina, A. S. (2022). Literature Review: Faktor Kecemasan Matematika Siswa dan Upaya Mengatasinya. J-PiMat : Jurnal Pendidikan Matematika, 4(1), 443–450.

Dwi Saputri, P. (2022). Pengaruh Penggunaan Media Ular Tangga terhadap Hasil Belajar Siswa dalam Pembelajaran Matematika Kelas 5 di SDN 01 Manisrejo. Prosiding Konferensi Ilmiah Dasar, 3.

Eviliyanida. (2020). Model Pembelajaran Kooperatif. Visipena Journal, 2(1), 21–27.

Fadilah, dkk Purwakarta, Pengertian Media, Tujuan, Fungsi, Manfaat dan Urgensi Media Pembelajaran Journal of Student Research (JSR), 1(2).

Fashikhah. (2022). Pendekatan Saintifik Berbantuan Model Pembelajaran Tipe TGT (A. Kori (Ed.); Cetakan Pertama). Pustaka Egaliter.

Kamila, R. T., dan Abduh, M. (2022). Bagaimana Minat Belajar dan Lingkungan Keluarga Mempengaruhi Kesulitan Belajar Matematika di Sekolah Dasar? JurnalBasicedu,6(3),5097–

Kurniawan, dkk (2024). Penerapan Pembelajaran Kooperatif TGT Melalui Media Permainan Ular Tangga Untuk Meningkatkan Hasil Belajar Matematika Siswa SD. Jurnal Jendela Pendidikan, 4(02), 143–151. Mahardiyanti, T. (2024). Analisis Faktor Penyebab Kesulitan Belajar Matematika Siswa Sekolah Dasar. PTK: Jurnal Tindakan Kelas, 5(1), 250–258.

Marlita, dkk. (2023). Peningkatan Hasil Belajar IPAS Melalui Model Pembelajaran TGT Berbasis Media FTB. Al-Madrasah: Jurnal Pendidikan Madrasah Ibtidaiyah, 7(4), 1646.

Miza Anniza, dkk (2024). Metode Permainan Ular Tangga Pada Pembelajaran Matematika Yang Menyenangkan Bagi Siswa Kelas II Di SD Negeri 22 Kota Bengkulu. Journal Of Human And Education (Jahe), 4(4), 91–96.

Munirah, M. (2020). Prinsip-Prinsip Belajar Dan Pembelajaran (Perhatian dan Motivasi, Keaktifan, Keterlibatan Langsung, Pengulangan, Tantangan dan Perbedaan Individu). Auladuna: Jurnal Pendidikan Dasar Islam, 5(1), 116–125.

Mytra, dkk (2023). Filsafat Pendidikan Matematika (Matematika Sebagai Alat Pikir Dan Bahasa Ilmu). AL JABAR: Jurnal Pendidikan Dan Pembelajaran Matematika, 2(2), 60–71.

Nahdania, S., dan Ain, S. Q. (2024). Menggali Penyebab Rendahnya Hasil Belajar Matematika di Kelas V SD Negeri 001 Tanjung. Jayapangus Press Cetta: Jurnal Ilmu Pendidikan.

Ningrum, dkk (2023). Pengaruh Model TGT Berbantuan Media Clock Set Terhadap Pemahaman Konsep Matematika SD. Polinomial : Jurnal Pendidikan Matematika, 2(2), 62–74.

Noviani, T. (2020). Pengembangan Alat Permainan Edukatif Ular Tangga Bilangan Untuk Busthanul Athfal. E-Jurnal Skripsi Program Studi Teknologi 20,681–688.

Rahayu, dkk. (2025). Pengaruh Pendekatan Pembelajaran Teams Games Tournament (TGT) dengan Media Permainan Ular Tangga Terhadap Kemampuan Numerasi Siswa. 14(1), 461–472.

Ramli, R., Damopolii, M., dan Alauddin Makassar, U. (n.d.). Prinsip-Prinsip Belajar dan Pembelajaran. Saputri, R. D. R., & Setyawan, A. (2023). Upaya Meningkatkan Hasil Belajar Menggunakan Model Team Games Tournament (TGT) Dalam Pembelajaran Matematika Di UPTD SDN Karang Anyar 01. JR- PGSD: Jurnal Rinjani Pendidikan Guru Sekolah Dasar, 1(2), 34–40.

Savriliana, V., Sundari, K., & Budianti, Y. (2020). Media Dakota (Dakon Matematika) Sebagai Solusi untuk Meningkatkan Hasil Belajar Matematika Siswa Sekolah Dasar. Jurnal Basicedu, 4(4), 1160–1166.

Sugiono. (2023). Metodologi Penelitian Kuantitatif Kualitatif (Sutopo (Ed.)). Penerbit Alfabeta. Susilana Rudi. (2023). Media Pembelajaran. CV Wacana Prima.

Tanjung, D. S., Ambarwati, N. F., Juliana, & Prayuda, M. S. (2024). Application of the Problem Based Learning Model to Improve Students ' Learning Outcomes and Critical Thinking Ability on Mathematics Lessons in Primary School. Jurnal PAJAR (Pendidikan Dan Pengajaran), 8(3), 307–318. Tanjung, D. S., & Juliana. (2022). Pengaruh Model Pembelajaran Berbasis Proyek terhadap Hasil Belajar Matematika Siswa Sekolah Dasar. Elementary School Journal PGSD FIP Unimed, 12(1), 37–44.

Tanjung, D. S., & Juliana. (2023). The Effect of Giving Rewards on Fifth-Grade Elementary Students' Mathematics Learning Outcomes Pengaruh Pemberian Reward Terhadap Hasil Belajar Matematika Siswa Kelas V Sekolah Dasar. 12(6), 1396–1406.

Tanjung, D. S., Juliana, & HS, D. W. S. (2023). Improving Fourth-Grade Students' Learning Outcomes Using the Discovery Learning Method in Indonesian at SD Negeri 200111 Padangsidimpuan. Primary: Jurnal Pendidikan Guru Sekolah Dasar, 12(5), 1302–1313.

Tanjung, D. S., Siregar, Y. S., & Juliana. (2025a). Analysis of Most Significant Bit (MSB) Steganography Method in an IoT-Based Keyboard Learning System. Brilliance: Research of Artificial Intelligence, 5(1), 37–43.

Tanjung, D. S., Siregar, Y. S., & Juliana. (2025b). Internet of Things (IoT) Based Keyboard Learning Application Model For Preventing Carpal Tunnel Syndrome. Journal of Information Systems Engineering and Management, 10(16s), 2468–4376.

Tanjung, D. S., Tamba, R. S. H., Sinaga, V., & Tarihoran, A. C. (2025). Penerapan Model Pembelajaran Project-Based Learning Untuk Meningkatkan Hasil Belajar Ipas Peserta Didik Kelas Vi-B SD. School Education Journal Pgsd Fip Unimed, 15(1), 61–70.

Wardan, dkk (n.d.). Seminar Nasional PGSD UNIKAMA Pengaruh Pembelajaran Melalui Game Ular Tangga Berbantuan Media Visual Terhadap Hasil Belajar Matematika Siswa Kelas IV SDN Nglebak Kecamatan Bareng Kabupaten Jombang. https://conference.unikama.ac.id/artikel/

Yanti, dkk (2024). Teori Belajar Kognitif Dan Implikasinya Dalam Pembelajaran. Adiba: Journal Of Education, 4(3), 338–344.

Yulianti, dkk (2025). Keefektifan Model Teams Games Tournament (TGT) Berbantuan Media Permainan Ular Tangga Berbasis Misi Terhadap Motivasi dan Hasil Belajar Matematika Kelas III Sekolah Dasar. 10(2), 98–108.

Yuniarti, dkk Keguruan, F. (n.d.). Memahami Media Untuk Efektifitas Pembelajaran (Vol. 4, Issue 2). Zahra, Abdullah, V., dan Marini, A. (2023). Meningkatkan Kemampuan Pemecahan Masalah Matematis Siswa Sekolah Dasar Dengan Model Pembelajaran. *Jurnal Pendidikan Dasar*, 2(8), 985–996. 4459.