ENHANCING THIRD-GRADE STUDENTS' LEARNING OUTCOMES THROUGH THE COOPERATIVE TEAM GAME TOURNAMENT (TGT) MODEL USING SNAKES AND LADDERS MEDIA ON PLANE FIGURES

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Abstract

This study aims to enhance the learning outcomes of third-grade students on the topic of plane figures through the implementation of the Cooperative Learning Model Team Game Tournament (TGT) assisted by the Snakes and Ladders educational game. The research employed a Classroom Action Research (CAR) design conducted in three cycles, each consisting of planning, implementation, observation, and reflection stages. The subjects were 12 third-grade students of SDN Tanjung Selamat, consisting of 5 boys and 7 girls. Data were collected by observation for teacher and student activities as well as learning outcome tests. The results indicated a consistent improvement in both teacher and student activities as well as student achievement. Teacher activity increased from 58% in Cycle I (fair) to 79% in Cycle II (good), and 95% in Cycle III (very good). Student activity rose from 56% (fair) to 77% (good) and finally 92% (very good). Student learning mastery improved from 42% in Cycle I to 58.33% in Cycle II, and 83.33% in Cycle III, surpassing the minimum mastery criterion. These findings suggest that the implementation of the Cooperative TGT model with Snakes and Ladders media effectively enhances student engagement and learning outcomes in mathematics, particularly in understanding plane figures.

Keywords: Cooperative Learning, Learning Outcomes, Plane Figures, Snakes and Ladders, Team Game Tournament (TGT)

Abstrak

Penelitian ini bertujuan untuk meningkatkan hasil belajar siswa kelas III pada materi bangun datar melalui penerapan model pembelajaran kooperatif *Team Game Tournament* (TGT) berbantuan media permainan *Ular Tangga*. Penelitian ini merupakan penelitian tindakan kelas (PTK) yang dilaksanakan dalam tiga siklus, masing-masing terdiri atas tahap perencanaan, pelaksanaan tindakan, observasi, dan refleksi. Subjek penelitian adalah 12 siswa kelas III SDN Tanjung Selamat yang terdiri dari 5 siswa laki-laki dan 7 siswa perempuan. Teknik pengumpulan data menggunakan lembar observasi aktivitas guru dan siswa serta tes hasil belajar. Hasil penelitian menunjukkan adanya peningkatan pada aktivitas guru, aktivitas siswa, dan hasil belajar. Terjadi peningkatan aktivitas guru dari 58% pada siklus I (kategori cukup), menjadi 79% pada siklus II (kategori baik), dan 95% pada siklus III (kategori sangat baik). Aktivitas siswa meningkat dari 56% (kategori cukup), menjadi 77% (kategori baik), dan 92% (kategori sangat baik). Ketuntasan hasil belajar siswa meningkat dari 42% pada siklus I, menjadi 58,33% pada siklus II, dan mencapai

83,33% pada siklus III, yang berarti telah melampaui kriteria ketuntasan minimal. Sehingga, penerapan model pembelajaran kooperatif TGT berbantuan media *Ular Tangga* efektif dalam meningkatkan hasil belajar matematika pada materi bangun datar.

Kata kunci: Pembelajaran Kooperatif, *Team Game Tournament* (TGT), *Ular Tangga*, Bangun Datar, Hasil Belajar

1. INTRODUCTION

The teaching and learning process inherently involves essential components that serve as benchmarks for educational success. Learning can be considered effective when the intended learning objectives are achieved, as reflected in students' learning outcomes. High levels of student achievement result from a high-quality learning process, which requires educators to possess the ability to effectively design, implement, and manage classroom activities. However, a mismatch between the teaching methods employed and the learning context can significantly diminish the effectivity of the instructional process, particularly in terms of students' learning outcomes.

Mathematics is a field of study that connected to various aspects of basis life; therefore, its teaching and learning has main role in education. The importance of mathematics education is evident in its inclusion across all levels of schooling, from primary and secondary education to higher education (Agusdianita, 2020).

However, mathematics learning at the elementary school level is complicated, and fear subject. Many students struggle to understand mathematical concepts and find it challenging to engage with the material. One example is the topic of plane geometry, which is filled with symbols, formulas, and numbers that can make students even less interested in learning. Nevertheless, if teachers are able to present geometric concepts creatively by using concrete representations, enjoyable activities, and learning-through-play approaches students are more likely to feel motivated and develop a genuine interest in learning the subject.

By observations, the researcher at SDN Tanjung Selamat on January 16, 2024, several cases were identified during the learning process. It was found that instructional models and media had not been applied; the teacher primarily relied on the lecture method to deliver information. The learning process commonly to be monotonous, with limited interaction between teachers and students. Learning remained teacher-centered, providing little to no feedback, and students received information passively. Such

conditions make the learning process less ideal and may ultimately lead to lower student learning outcomes (Abas Asyafah, 2019).

In this study, the researcher employed the *Team Game Tournament* (TGT) model, a wide range of cooperative learning approach that incorporates academic tournaments. This model is relatively easy to implement in classroom settings and actively involves all students, emphasizing teamwork and healthy competition among groups (Marliana, 2019; Sulistio, 2022).

This model is designed to create an engaging, enjoyable, and challenging learning atmosphere in which students can collaborate while competing to achieve the highest scores. The selection of appropriate instructional media should be carefully considered, taking into account both the suitability of the learning content and the characteristics of the students. One of the fundamental characteristics of elementary school children is their natural inclination to play, as play is an essential and inseparable part of their developmental needs(Mohamed & Kandeel, 2023; Syafif, 2022).

Appropriate instructional media can facilitate students' ability to comprehend and respond to the material presented by the teacher. When learning content is unclear or difficult to convey verbally, the use of media can help simplify and clarify the information. Media can represent concepts that educators are unable to express effectively through words alone, allowing abstract ideas to be made more concrete. Moreover, instructional media enable students to process and internalize learning materials more easily. Finally, the usage of instructional media ensures that learning content is organized, systematic, and effectively communicated (Batubara, 2011; Hayati, 2021; Miska & Hayati, 2024; Sari, 2016).

The *Snakes and Ladders* game serves as an educational game that provides a playful yet meaningful learning experience, stimulating students' engagement and maintaining their active participation in the learning process. Moreover, this traditional game embodies important values such as cooperation, honesty, responsibility, rule compliance, and sportsmanship in accepting both victory and defeat.

The researcher took the initiative to transform the learning environment into a more enjoyable and engaging experience through visualization and concrete explanation by implementing TGT assisted by the *Snakes and Ladders* educational game. This study focuses on the topic of area, perimeter, and the properties of plane figures. In this

approach, students are invited to play in a manner similar to the traditional *Snakes and Ladders* game; however, each square on the board contains questions related to the geometry topics that have been previously learned.

2. LITERATURE REVIEW

A. *Team Game Tournament Cooperative Learning Model*

A learning model that aligns with the characteristics of the instructional material can foster a high-quality learning process, thereby enabling the achievement of the intended competencies and leading to more optimal student learning outcomes (Billy Alexa Belvian, 2021; Trianto, 2011; Zikra , rani, 2022).

The use of an appropriate learning model can create a conducive learning environment; therefore, students' success in the learning process largely depends on the suitability of the instructional model applied by the teacher(Aris Sohimin, 2014; Nissa, 2022; Trianto, 2017) . TGT involves all students without distinguishing their status or ability levels. This model encourages peer tutoring among students and incorporates games or tournaments that stimulate enthusiasm and motivation for learning (Aris Sohimin, 2014; Sulistio, 2022). This model provides students with opportunities to learn in a more relaxed and enjoyable manner, reducing boredom while fostering responsibility, cooperation, healthy competition, and active engagement. The learning activities emphasize collaborative efforts among students to deepen their understanding of subject preparation for the tournament phase (Hayati Z, Oviana W, Jannah M, Sari, Ulya K, 2025; Hayati et al., 2025; indrawati, 2024; Jannah et al., 2025).

According to Slavin, tournament phase should include quizzes or questions that are relevant to the material previously learned, as this allows for the assessment of students' knowledge and understanding gained during the learning process (Robert E.Slavin, 2008).

This aligns with the characteristics of primary school, who still require extensive learning experiences constructed through play-based activities (Nurma Cahyani, 2019).

From the explanation above, it can be concluded that TGT model represents a learning approach integrated with academic game tournaments. The game is conducted through an inter-group competition system in which group rewards are given based on performance. Slavin (1995) states that there are five main components in TGT learning

model: (1) class presentation, (2) teams, (3) games, (4) tournaments, and (5) team recognition (Robert E.Slavin, 2008).

Steps for Implementing the *Teams Games Tournament* (TGT) Model

The following are steps for implementing the TGT model as proposed by Mel Silberman:(Miska & Hayati, 2024; Silbertman, 2009; Ulfa Fauziah, 2018)

a. Students are divided into heterogeneous groups consisting of 2–4 members.

b. Students are given time to collaboratively review and discuss the material to be learned.

c. The teacher explains the rules and procedures of the tournament.

d. The teacher provides each team with a series of questions to answer.

e. After the tournament is completed, an assessment is conducted by calculating the scores obtained by each group.

f. The teacher announces the scores of all groups.

g. The group with the highest score receives recognition in the form of awards such as *Great Team*, *Best Team*, or *Good Team*.

B. Snakes and Ladders Media

Instructional media are tools that can be manipulated to influence students' thoughts, feelings, attention, and attitudes. These media can generally be classified into three types: visual, audio, and audiovisual media. In this study, the researcher employed a visual-based learning medium specifically, its educational game which is tangible, visible, and interactive in nature.

its a traditional game that is widely enjoyed by people of all ages, primarily designed to create a sense of enjoyment and engagement. This medium is presented in the form of a game that aligns with the traits and learning sufficient of students.

It game does not have a fixed design standard; therefore, anyone can design and modify the game board according to their needs and preferences to make it more engaging. This game can be integrated into mathematics learning, particularly in teaching multiplication, with the goal of motivating students and develop learning outcomes. Before the learning media are implemented in the classroom, students are encouraged to review the material so that they can answer the questions provided on the game board. The

board consists of a series of small squares, accompanied by several snakes and ladders that connect one square to another (indrawati, 2024).

In relation to this, Ratnaningsih stated its game possesses the following items:(Hasil et al., 2020)

1. its played on a board involving two to four groups, with each member taking turns to play.
2. its divided into small squares containing images of ladders and snakes. Each square includes a question that must be answered or solved before the player can advance to the next square.
3. Each player begins the game by placing their token on the starting square. The token is then moved according to the number rolled on the dice.
4. If a player rolls a six, they are granted an additional turn to roll the dice once more.
5. When a player lands on the bottom of a ladder, they may immediately climb to the square at the top of that ladder. Conversely, if a player lands on a square depicting the tail of a snake, they must move their token down to the square at the snake's head.
6. The winner of its game is the player who first reaches the finish square or the final square (the 100th square).
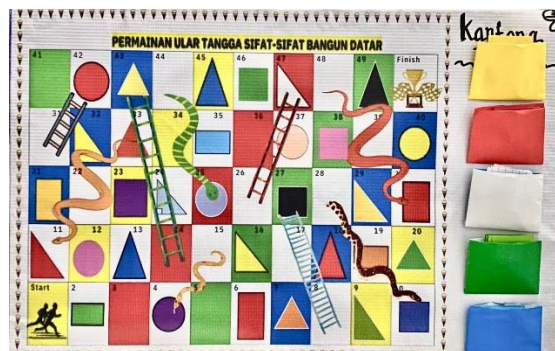

Figure.1 Snakes and Ladders Media.

All fundamental characteristics of itss retained, with a minor modification to the numbering and structure of the game board. The modified board consists of 50 squares, each containing randomized questions related to the topic of two-dimensional geometric shapes. The players move their tokens according to the number shown on the dice after each roll. When a token land on a square, the player or group must answer a question or complete

a challenge presented in that square as a prerequisite to proceed to the next stage. If the answer is correct, the player or group earns points; however, if the answer is incorrect, the turn passes to the next group.

When a player lands at the bottom of a ladder, they are allowed to move directly to the square at the top of that ladder and answer the question provided in the new square. Conversely, if a player lands on a square depicting the tail of a snake, they must move down to the square at the snake's head and still answer the question located there. The winner of game is the player who reaches the final square first while also achieving the highest overall score.

3. METHOD

The type of research employed in this study is Classroom Action Research (CAR). In this research design, the researcher is directly involved in the classroom during the learning process by implementing planned actions and interventions aimed at addressing specific problems encountered in the classroom setting. The actions are carried out to improve the teaching and learning process in order to enhance students' learning outcomes compared to previous conditions, as well as to improve the teacher's performance. The ultimate purpose of Classroom Action Research is to identify, analyze, and resolve classroom problems through systematic and reflective cycles of planning, action, observation, and evaluation (H.Salim, 2019; Siti K, 2022).

According to Arikunto, CAR is a type of research that describes the cause-and-effect relationship resulting from a particular intervention while simultaneously presenting the entire process from the initial implementation of the treatment to its observed outcomes (Mulyatiningsih, 2014; Suharsimi Arikunto, 2012). Classroom Action Research also serves as a strategic approach aimed at solving problems that arise in the teaching and learning process (Kemmis, 1998). Each cycle consists of four stages, namely planning, action, implementation, observation, and reflection.
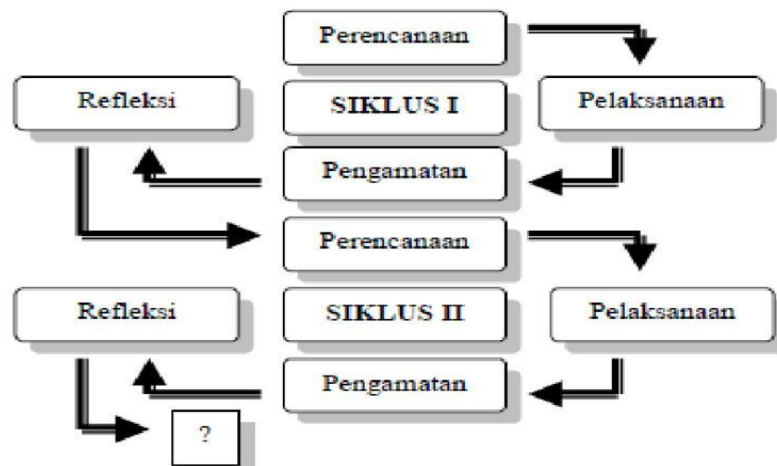
Figure 2. Kemmis and Mc. Taiggairt Model Class room Action Research (Kemmis, 1998)

This study was elaborated in a third-grade classroom at SD. The subjects of this research were twelve third-grade students, namely of five boys and seven wamen students.

Instrument research

According to Arikunto, a research instrument is a tool used to support the process of data collection. The instruments employed in this study included: 1) a teacher activity observation sheet, 2) a student activity observation sheet, and 3) a test instrument.

Data Analysis

The data analysis techniques employed in this study were as follows:

1. **Analysis of Teacher and Student Activity Observations.** The data on teacher and student activities were obtained through direct observation during the learning process. The collected data were then analyzed using the following statistical formula:

$$P = \frac{f}{n} \, x \, 100\%$$

Anas Sudjono states that the teacher's activity during the learning process is considered to have reached the level of success if it falls within the category of *very good activity*.

Table 1 Evaluation Observation Criteria (Sudijono, 2015)

Percentage	Chategory
80% - 100%	Very Good
66% - 79%	Good
56% - 65%	Enough
40% - 55%	Less Good

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30% - 39%	Fail

Learning Outcome

The students' learning outcomes were analyzed based on both individual and classical mastery criteria. A class was considered to have achieved classical mastery when at least 75% of the students met the school's minimum mastery criterion of 70. At the individual level, mastery was defined as obtaining a minimum score of 60. Students' learning outcomes are considered to have achieved mastery if they obtain a score above 60. To determine the level of classical learning mastery, the calculation is conducted using the following formula.(Trianto, 2017)

$$KS = \frac{ST}{n} \times 100\%$$

KS = Classical mistery

ST = Student's mistery

N = All participant

4. RESULTS AND DISCUSSION

Teacher Activity and Learning

Figure 3 shows a consistent improvement in teacher activities across the three cycles of Classroom Action Research. In Cycle I, teacher activity reached 58%, indicating that the implementation of the Team Game Tournament (TGT) model supported by *Snakes and Ladders* media was still not optimal, as the teacher was adapting to the learning steps and classroom management. In Cycle II, teacher activity increased to 79%, reflecting better mastery of the learning model, clearer instruction, and improved classroom management following reflection and revisions from the first cycle. In Cycle III, teacher activity further increased to 95%, categorized as very good, demonstrating that the teacher was able to implement the TGT model effectively, manage learning activities efficiently, and facilitate student engagement optimally. Overall, the diagram confirms that continuous reflection and improvement in each cycle successfully enhanced teacher performance in the learning process.
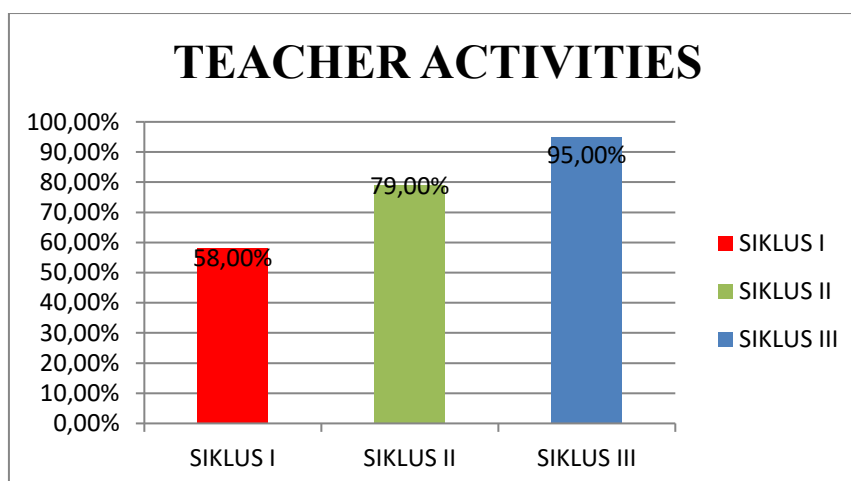
Figure. 3 Diagram Teacher Activities I, II and III Cycle

Teacher's performance in managing the learning process using the Team Game Tournament (TGT) model supported by the *Snakes and Ladders* game media demonstrated progressive improvement across all cycles, as evidenced by the observation data from Cycles I, II, and III. The improvement was attributed to the reflective findings from each cycle, which were used as the basis for planning and implementing better instructional strategies in the following cycles.

Table. 2. The Elaboration in Detail Process of Teacher Activity Cycle I, II and III

Teacher Activities	Cycle I	Cycle II	Cycle III
Cases	The teacher demonstrated limited ability to manage the classroom environment effectively at the start of the lesson. The teacher encountered challenges in clearly conveying the instructional steps during the learning process	The teacher faced challenges in clearly explaining the lesson material on the perimeter of two-dimensional figures and in maintaining effective classroom management during the game stage.	Teacher's compability to manage the classroom and conduct the learning process improved, achieving a score of 95%, which is categorized as *very good*.
Action	In the subsequent session, the teacher prioritized creating a calm classroom environment before starting the lesson.	In next session, teacher focused on delivering the lesson content using language that	All aspects of the teacher's performance aligned with the prepared lesson plan (RPP) and adhered to

Additionally, the teacher was expected to demonstrate mastery of the instructional steps to be applied.	students could easily comprehend. Additionally, the teacher reinforced the game rules to ensure that the learning activity proceeded in an organized and orderly manner.	the procedural steps of the learning model. Consequently, the instructional activities were clear, easy to implement, and the cycle was deemed complete, requiring no further continuation.

Students' Activities During the Learning Process

The students' activities during the learning process in Cycles I, II, and III also showed improvement. The increase in students' activity at each cycle can be seen in the graph below.
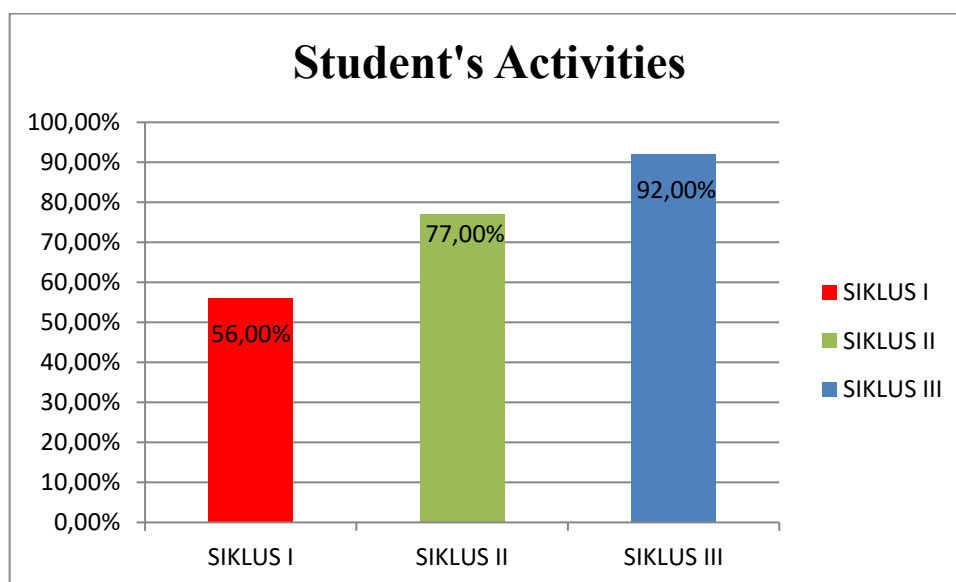

Figure 4 Student's Activities

Figure 4 depicts a clear upward trend in student activities throughout the three cycles of the Classroom Action Research. Student participation in Cycle I was recorded at 56%, showing that many students were still passive and adjusting to the learning process using TGT with *game*. After improvements were implemented, student activity in Cycle II rose to 77%, indicating that students became more involved in discussions, cooperative work, and game-based tasks. In Cycle III, student activity reached 92%, reflecting a high level of enthusiasm, interaction, and active participation during learning activities. These

results indicate that repeated implementation and refinement of the learning strategy successfully fostered more active student engagement in the classroom.

Table 3. Student Activities

Student Activities	Cycle I	Cycle II	Cycle III
Cases	• some students demonstrated limited attention to the instructional steps explained by the teacher. In addition, their progress in reading and comprehending the material on the area of two-dimensional figures from the student textbook remained relatively low.	The students showed limited attentiveness during the presentation of the material on the perimeter of two-dimensional figures. They also experienced difficulties in answering the questions provided in the *Snakes and Ladders* game within the three-minute time frame.	The students' learning activities during the instructional process achieved a percentage score of 92%, which falls into the "very good" category.
Action	In the following meeting, the teacher should take stricter actions toward students paying attention to the learning steps. Additionally, the teacher should encourage and motivate students to take turns reading the learning material aloud.	In the following meeting, the teacher should take stricter actions toward students listening to the learning steps. The teacher should pay attention and give a warning to students who take more than three minutes to answer.	Each aspect of the students' activities showed improvement through applying TGT, reaching the "very good" category; therefore, the cycle was not continued (considered complete).

1. Students' Learning Outcomes

To evaluate the success of this study, the researcher doing test at the end of learning to measure the students' comprehending. The learning outcomes of the students at SDN Tanjung Selamat were assessed based on the KKTP set by the school, which is 70. The development in students across each cycle can be seen in the graph below:
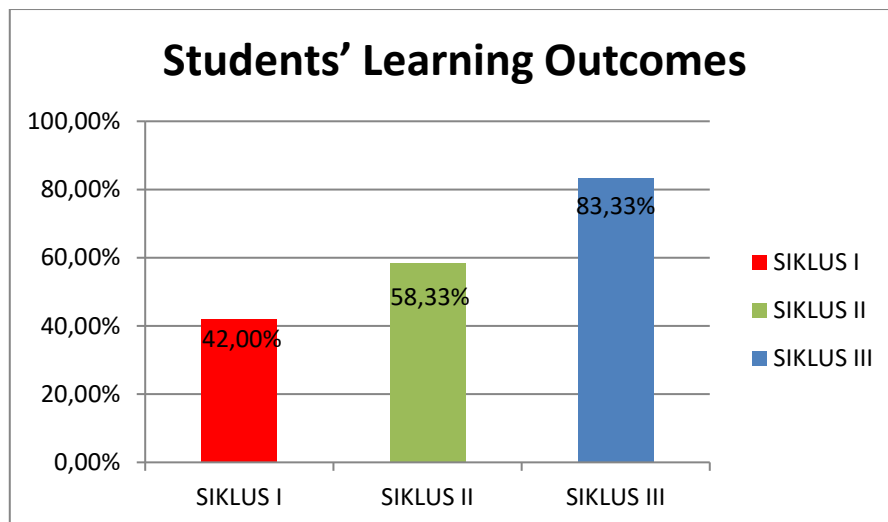
Figure 5. Students' Learning Outcomes

Figure 5 illustrates the progression of students' learning outcomes across the three cycles of the Classroom Action Research. In Cycle I, learning mastery reached 42%, indicating that less than half of the students achieved the expected learning criteria and that many students were still experiencing difficulties in understanding the material. In Cycle II, the percentage of learning outcomes increased to 58.33%, showing a noticeable improvement as more students began to achieve mastery following refinements in the learning process and instructional strategies. In Cycle III, students' learning outcomes rose substantially to 83.33%, reflecting that the majority of students successfully met the learning objectives. This steady increase demonstrates that the implementation of TGT model supported by *Snakes and Ladders* media was effective in improving students' learning outcomes through iterative cycles of action and reflection.

Based on this analysis, it can be concluded that the students' learning outcomes through the implementation of the TGT model assisted by the Snakes and Ladders game were successfully improved.

Table 4. Learning Outcome

Student Activities	Cycle I	Cycle II	Cycle III
Cases	• There were 5 students who achieved learning mastery with a percentage of 42%, while 7 other students did not reach the	7 students who achieved learning mastery with a percentage of 58.33%, while 5 other students did	Only 2 students did not achieve learning mastery, representing 16.66%, whereas 10 students successfully achieved mastery with

	required score, representing 58.33%. Therefore, the students' learning outcomes in Cycle I had not yet met the established mastery criterion.	not reach the required score, representing 42%. Therefore, the students' learning outcomes in Cycle II had not yet achieved the expected mastery criterion.	a percentage of 83.33%. This percentage indicates an improvement from 58.33% in Cycle II to 83.33% in Cycle III. Therefore, the students' learning outcomes in Cycle III had successfully met the mastery criterion.
Action	In the next meeting, the teacher will guide the student's explanation of the learning material through the implementation of game and mathematics tournament. This approach is expected to help students better understand the material and improve their performance in answering test.	In the next meeting, the teacher will optimize guidance for the students and provide a more detailed explanation of the learning material through the implementation of the Snakes and Ladders game and mathematics tournament, enabling them to answer the test questions more easily.	No further revisions were made because the indicators of success had already been achieved.

Overall, The improvement in teacher activities, student participation, and learning outcomes across the research cycles was influenced by effective time management, increased student readiness, and reduced learning constraints. In Cycle I, time management was not optimal due to the teacher's adjustment to the Team Game Tournament (TGT) learning model, resulting in limited student engagement. Students also showed low readiness, as they were unfamiliar with cooperative and game-based learning, leading to passive behavior and confusion during activities. In Cycle II, better time allocation and clearer instructions improved student readiness and participation, although some students still required guidance. By Cycle III, learning time was managed efficiently, students demonstrated high readiness and confidence, and most learning constraints were

minimized. These findings indicate that continuous reflection and improvement in instructional management effectively enhanced the learning process in the classroom.

The novelty of this study is the implementation of the Team Game Tournament (TGT) model supported by Snakes and Ladders game media through Classroom Action Research, which simultaneously enhances teacher performance, student readiness, and learning outcomes. This research highlights the role of reflective cycles in optimizing time management and minimizing learning constraints in game-based cooperative learning. This study offers novelty by demonstrating how the adaptation of a traditional board game within TGT model can serve as an effective pedagogical strategy to increase student engagement and learning mastery while systematically improving classroom management through iterative action research cycles.

CONCLUSION

1. The teacher's activity achieved a percentage score of 58%, which falls into the *fair* category cycle I. In Cycle II, it increased to 79%, categorized as *good*, and further improved in Cycle III to 95%, categorized as *very good*.
2. The students' activity in Cycle I achieved a percentage score of 56%, which falls into the *fair* category. It increased to 77% in Cycle II, categorized as *good*, and further improved to 92% in Cycle III, categorized as *very good*.
3. The students' test results in Cycle I, participated by 12 students, showed that only 5 students achieved mastery with a percentage of 42%, while 7 students did not meet the mastery criterion, representing 58.33%. In Cycle II, there was a slight improvement, with 7 students achieving mastery (58.33%) and 5 students not yet achieving it (42%). However, in Cycle III, there was a significant improvement, with only 2 students not reaching the minimum mastery criterion (16.66%), while 10 students achieved mastery (83.33%).

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