Mathematics Learning: Model *Teams Games Tournament* in Grade IV SDN 108/II Perumnas

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Abstrak

This study aims to improve the mathematics learning process and outcomes of fourth-grade students at SD Negeri 108/II Perumnas through the implementation of the Team Games Tournament (TGT) learning model. The background of this study is based on low student engagement and learning outcomes that have not yet met the Learning Objective Achievement Criteria (KKTP), which is 75. The method used was Classroom Action Research (CAR), implemented in two cycles, with the stages of planning, implementation, observation, and reflection. Data were collected through observation sheets for the learning process and cognitive learning outcome tests. The results showed an improvement in student learning, as evidenced by the percentage of learning outcomes in cycle I, meeting 1, at 40.74%, meeting 2 at 51.85%, then increasing to 55.56% in cycle II, meeting 1, and 66.67% in meeting 2. Improvements were also evident in cognitive learning outcomes. While no students achieved the KKTP (competent mastery level) in the pre-cycle, 12 students (44.44%) achieved mastery in cycle 1, and this increased to 20 students (81.48%) in cycle II. Thus, the implementation of the TGT model has proven effective in improving both student mathematics learning processes and outcomes. This model is recommended as an innovative, fun, and competitive learning strategy that elementary school teachers can use to improve the quality of learning.

1. Introduction

Mathematics is a foundational subject in basic education that plays a crucial role in developing students' logical, analytical, and problem-solving skills—competencies essential for success in the

21st century (Maghfiroh et al., 2024; Safitri, 2020). In Indonesia, however, mathematics learning outcomes remain suboptimal, particularly in elementary schools, where students often struggle with abstract concepts and show low engagement (Fadhli, 2023). This situation is exacerbated when teaching remains teacher-centered, limiting opportunities for active participation and meaningful knowledge construction.

Initial observations conducted in December 2024 at Grade IV of SDN 108/II Perumnas revealed alarming learning conditions: 0% of students achieved the Minimum Completeness Criterion (KKTP = 75), with an average pre-cycle score of only 47.52. Classroom dynamics were largely passive—students rarely asked questions, hesitated to participate, and displayed low motivation. Teachers relied heavily on lecture-based methods, resulting in one-way communication that failed to stimulate critical thinking or collaborative learning.

A key factor contributing to this challenge is the lack of innovative, student-centered instructional models. Conventional approaches do not accommodate diverse learning styles nor foster intrinsic motivation—particularly in mathematics, where anxiety and disinterest are common (Nurhanifah & Dewi, 2024). To address this, educators are encouraged to adopt cooperative and game-based strategies that transform learning into an active, enjoyable, and socially engaging experience (Romdhoni et al., 2024).

The Teams Games Tournament (TGT) model offers a promising solution. As a cooperative learning strategy, TGT integrates team collaboration, academic games, and friendly tournaments to promote mastery, peer support, and healthy competition (Tri, 2024; Muhammad, 2024). Prior studies affirm its effectiveness in improving student engagement, social interaction, and academic achievement in mathematics (Maghfiroh et al., 2024; Basri et al., 2021). Given the context of SDN 108/II Perumnas, implementing TGT is expected to revitalize the learning atmosphere and bridge the gap between current performance and curriculum expectations. Research Purpose, This study aims to: 1) improve the mathematics learning process—specifically student engagement, cooperation, and active participation—in Grade IV of SDN 108/II Perumnas through the implementation of the Teams Games Tournament (TGT) model; and 2) enhance students' cognitive learning outcomes, measured by the percentage of students achieving the KKTP (≥75) and the mean class score across two cycles of Classroom Action Research.

2. Method

This study employed Classroom Action Research (CAR) using the Kemmis and Taggart (1988) model, which consists of iterative cycles of planning, acting, observing, and reflecting. Each cycle was refined based on reflection to improve implementation in the subsequent cycle. The research was conducted over two cycles (May 16–31, 2025) in Grade IV of SDN 108/II Perumnas, involving 27 students. Each cycle comprised two meetings, integrating the Teams Games Tournament (TGT) model during mathematics instruction on whole number operations.

Data were collected through (1) observation sheets (for teacher and student activities) and (2) cognitive learning outcome tests (pre-cycle, post-Cycle I, and post-Cycle II). The observation data were analyzed descriptively to assess improvements in the learning process (e.g., participation, cooperation), while test scores were analyzed quantitatively to determine classical completeness (% ≥ KKTP = 75) and mean achievement. Success was defined as ≥80% of students achieving KKTP and ≥80% classical activity in the "Good" or "Very Good" category.

3.   Results and Discussion

3. 1 Results

3.1.1. General Overview of the Study

This classroom action research was carried out in two cycles, each consisting of two meetings. Cycle I took place on 16 and 26 May 2025, while Cycle II was conducted on 28 and 31 May 2025. Each cycle included the stages of planning, implementation and observation, reflection, and replanning to improve the learning process in the following cycle. The research subjects were 27 fourth-grade students at SDN 108/II Perumnas. All observations of teacher and student activities were conducted by the classroom teacher acting as the observer, using previously validated observation sheets.

3.1.2. Teacher Performance Observation Results

Observations of teacher performance were conducted at every meeting to assess the alignment of teaching steps with the applied model. In Cycle I meeting 1, the teacher performance score reached 84.61%, increasing to 92.31% in meeting 2. In Cycle II, the score reached 86.67% in both meetings. Descriptively, these values indicate that the teacher was able to conduct learning according to the steps of the Teams Games Tournament (TGT) model at a good level.

Table 1. Teacher's Observation

Yes	Cycle I	Percentage%	Cycle II	Percentage%
1	Meeting1	84,61%	Meeting1	86,67%
2	Meeting2	92,31%	Meeting2	86,67%

3.1.3. Student Activity Observation Results

Student activity showed improvement from one meeting to the next. In Cycle I meeting 1, only 40.74% of students were in the "very good" category. This category increased in the next meeting and further improved in Cycle II. By Cycle II meeting 2, the percentage of students in the "very good" category reached 85.18%. This upward trend indicates that the application of the TGT model contributed to enhancing student engagement in the learning process.
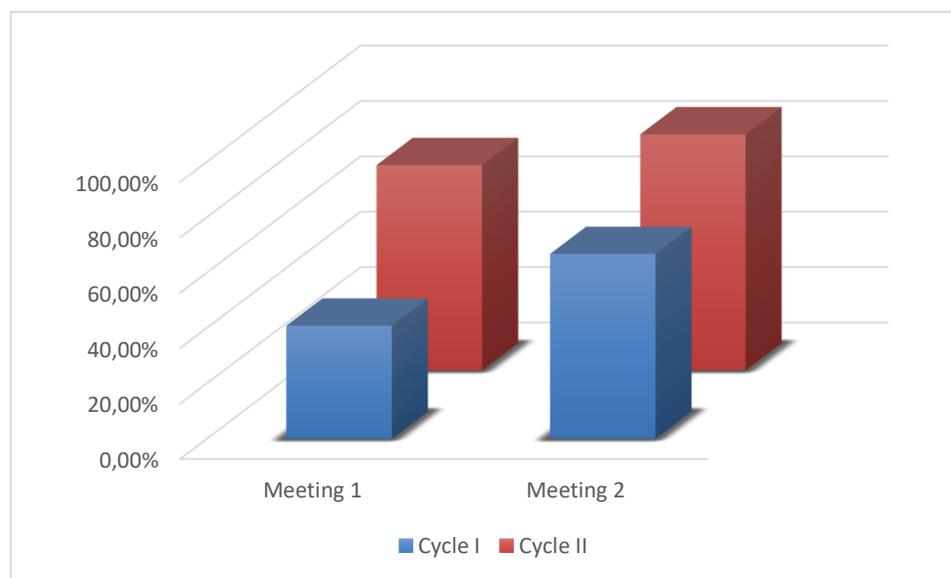

Figure 2. Observation Results

3.1.4. Students' Cognitive Learning Outcomes

Students' learning outcomes improved clearly from the pre-cycle phase to Cycle II. In the pre-cycle stage, no students achieved the minimum mastery criterion (KKTP ≥ 75), with an average score of 47.52. After the intervention in Cycle I, the number of students achieving mastery increased to 12 (44.44%), with an average score of 70.00. A more substantial increase occurred in Cycle II, where 22 students (81.48%) reached mastery, and the average score rose to 82.22. Descriptively, these results show an improvement in cognitive ability following the implementation of the TGT model.
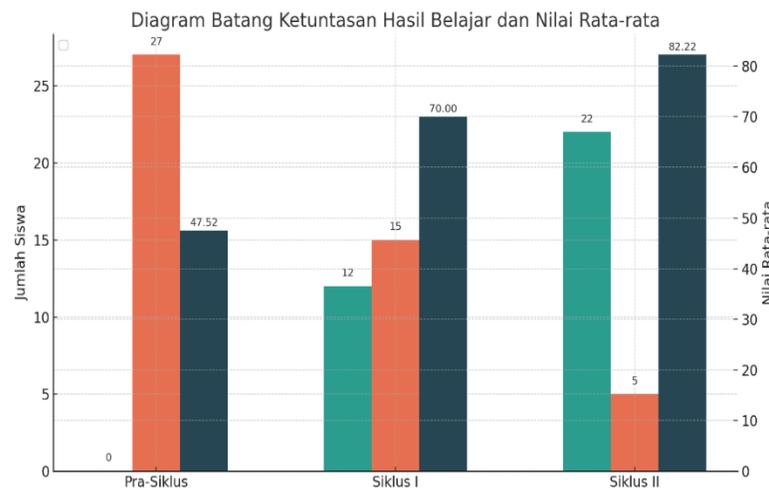

Figure 3. learning completion results

3. 2 Discussion

3.2.1. Improve the mathematics learning process

The observational data indicate a gradual rise in student engagement, cooperation, and participation across the two research cycles. These outcomes correspond to the first research purpose, suggesting that the TGT model helped create a more interactive environment. Group-based activities and tournament-style tasks provided students with social and cognitive incentives to participate more actively in classroom tasks.

Even so, attributing the improvement solely to the TGT model would be premature. Increased activity may have emerged from students' excitement about a new learning format or temporary motivation driven by competitive elements. The teacher's growing proficiency across cycles may also have influenced the perceived improvement. Consequently, while the process indicators align with the intended goal, the underlying causality remains uncertain and requires more robust validation.

3.2.2. Enhance students' cognitive learning outcomes

The descriptive data show substantial gains in student mastery, increasing from 0% in the pre-cycle to 81.48% in Cycle II. This improvement appears consistent with the second research purpose, which targeted higher cognitive achievement through cooperative and game-based learning. The structure of TGT—combining peer support and academic competition—likely contributed to improved conceptual understanding and performance on cognitive assessments.

However, without statistical testing or a comparison group, the magnitude of the improvement cannot be confidently linked to the TGT intervention alone. Students' progress may reflect repeated exposure to the material or instructional refinements made by the teacher during cycle reflections. Although the results support the intended learning outcome, the absence of inferential analysis limits the strength of claims about effectiveness.

3.2.3. Relationship Between Learning Process and Outcomes

The parallel upward trends in student activity and cognitive mastery suggest a potential relationship between an improved learning environment and enhanced academic results. A more active classroom could have contributed to deeper comprehension, particularly in cooperative tasks requiring discussion and collaborative problem-solving. This observation aligns with the theoretical foundation of the TGT model, which emphasizes social interaction as a driver of learning.

Despite this alignment, the observed relationship remains speculative because no correlational or regression analysis was conducted. Improvements in both areas may have been influenced by shared external factors, such as increased student motivation or better alignment between teaching strategies and learning materials in later cycles. Without empirical testing, the connection between process and outcomes cannot be firmly established.

3.2.4. Effectiveness of the TGT Model in the Research Context

Within the limited scope of this classroom action research, the TGT model appeared practically effective in revitalizing a passive learning environment. Students showed greater participation and demonstrated stronger cognitive performance by the end of Cycle II. These changes reflect the model's ability to promote structured collaboration and healthy competition, which can support more dynamic learning experiences.

Even so, the effectiveness observed here is context-dependent. Factors such as teacher control over group dynamics, classroom conditions, and instructional consistency likely contributed to the final outcome. Without broader testing in diverse settings, generalizing the effectiveness of TGT beyond the research site would be problematic. Effective implementation heavily depends on teacher competence and the availability of supporting learning resources.

4. Conclusion

This study demonstrates that the implementation of the Teams Games Tournament (TGT) model significantly improves both the learning process and cognitive outcomes in mathematics for Grade IV students at SDN 108/II Perumnas. The learning process—measured through student activity and collaboration—showed marked improvement, with the proportion of students in the "Good" to "Very Good" category rising from 40.74% in Cycle I Meeting 1 to 85.18% in Cycle II Meeting 2. Concurrently, cognitive learning outcomes improved dramatically: from 0% mastery (KKTP ≥ 75) in the pre-cycle (mean score = 47.52), to 44.44% (mean = 70.00) in Cycle I, and finally to 81.48% (mean = 82.22) in Cycle II. These findings confirm that TGT effectively fosters active participation, peer support, and healthy competition, thereby transforming a previously passive and teacher-centered classroom into a dynamic, student-centered learning environment.

Given its proven effectiveness, the TGT model is recommended as a practical and scalable innovation for elementary mathematics instruction. Teachers are encouraged to integrate TGT with careful attention to heterogeneous group formation, clear tournament guidelines, and reflective adjustments between cycles. Schools can support its adoption by providing game-based learning media and fostering a culture of collaborative professional development. Future research may extend this work by examining TGT's impact on affective domains (e.g., motivation, self-efficacy, attitude toward mathematics), applying it to other subjects or grade levels, or combining it with digital tools to enhance accessibility and engagement in diverse educational contexts.

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