

Application of The Cooperative Learning Model Type Student Teams Achievement Division (STAD) To Improve Mathematics Learning Outcomes of Fifth Grade Students at Uptd Sd Negeri 15 Parepare

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ABSTRACT

This study aimed to examine the implementation of the Student Teams Achievement Division (STAD) cooperative learning model to improve the learning process and mathematics learning outcomes on plane figures among fifth-grade students at UPTD SD Negeri 15 Parepare. Using a qualitative Classroom Action Research design, the study involved 26 students (10 boys and 16 girls) and was conducted over two cycles with two meetings per cycle through planning, action, observation, and reflection. Data were collected through observation, tests, and documentation. The findings showed consistent improvements in teacher performance, student learning activities, and learning outcomes, with mastery increasing from 18 students in Cycle I to 22 students in Cycle II. These findings indicate that the STAD model effectively enhances mathematics learning in elementary classrooms.

INTRODUCTION

Ideal mathematics learning is characterized by active student participation in solving problems and the ability to think critically mathematically based on real facts and situations. According to Rafianti & Maulana (2022), the ideal conditions for mathematics learning are expected to include several important skills that students need to possess. First, students are able to understand mathematical concepts and apply them in various situations. Second, students are skilled at performing arithmetic operations, analyzing the elements and properties of a mathematical concept, and then using them to solve problems. Third, students are able to think critically mathematically based on real facts or phenomena, formulate conjectures, conduct proofs, and provide logical explanations. Fourth, students have the ability to solve problems and communicate the process and results. Fifth, a positive attitude towards learning develops. Sixth, curiosity and self-confidence develop in learning mathematics. In line with these objectives of mathematics learning, students are required not only to be competent in classroom learning activities but also to be able to use their mathematical knowledge in everyday life.

Therefore, mathematics learning in elementary schools needs to be designed meaningfully, emphasizing conceptual understanding, not simply memorizing formulas. Through active student involvement, the material can be linked to real-life situations, making mathematics more contextual and applicable. According to Pasinggi & Tuken (2019), mathematics is a subject that contributes to shaping students' personalities because it hones reasoning skills.

However, the implementation of mathematics learning in elementary schools still encounters various challenges. Preliminary observations conducted in Grade V of UPTD SD Negeri 15 Parepare revealed that students' achievement in the topic of plane figures area had not yet reached the school's Minimum Learning Achievement Criteria (KKTP). The average class score was 75, whereas the KKTP established by the school was 80. Only 10 out of 25 students achieved the expected standard, while the remaining students obtained scores below the minimum criterion. These findings indicate that students' mathematics learning outcomes still require improvement. Furthermore, classroom observations and interviews with the classroom teacher revealed several instructional problems, including the limited communication of learning objectives, insufficient student involvement during classroom activities, and the lack of effective collaborative learning opportunities. On the students' side, low learning motivation, limited participation in group discussions, and inadequate collaborative skills contributed to the low learning outcomes.

One instructional approach that has been widely recognized for improving students' engagement and academic achievement is cooperative learning. Among various cooperative learning models, the Student Teams Achievement Division (STAD) model provides opportunities for students to work collaboratively in heterogeneous groups while maintaining individual accountability for learning. Through peer interaction, discussion, and

teamwork, students are encouraged to actively construct knowledge, solve problems collectively, and support one another in achieving learning objectives (Slavin, 1995; Ismatul Maula Ramadhani et al., 2022). Previous studies have consistently reported that STAD contributes positively to students' motivation, classroom participation, social interaction, and academic performance across various educational contexts.

Although the implementation of the STAD model has been frequently studied, there is still a scarcity of classroom action research focused on improving the process and outcomes of mathematics learning for the topic of the areas of two-dimensional shapes, particularly among fifth-grade students at UPTD SD Negeri 15 Parepare. To date, the majority of studies have tended to measure only final learning outcomes and have paid insufficient attention to the educational process itself—such as how active students are in class or how teachers perform while teaching. Therefore, this study is designed to fill this gap in the literature by assessing three aspects simultaneously: improvements in teacher performance, student engagement, and increased mathematics scores through the implementation of STAD. Through this comprehensive evaluation, this study will present practical evidence that cooperative learning models play a dual role in advancing students' cognitive abilities while simultaneously enhancing the quality of classroom instruction.

An examination of the provided description indicates that students' underperformance in mathematics stems from an inadequately optimized learning environment. This environment has not sufficiently engaged students actively nor fostered effective collaborative learning. To address these deficiencies, the implementation of a learning model designed to enhance student engagement, interaction, and accountability is recommended. Specifically, the cooperative learning model, Student Teams Achievement Division (STAD), is proposed as a suitable approach. Consequently, this research endeavors to elevate both the process and results of mathematics instruction through the application of this model, under the heading: "Implementing the Student Teams Achievement Division (STAD) Cooperative Learning Model to Enhance Mathematics Learning Outcomes for Fifth-Grade Students at UPTD SD Negeri 15 Parepare".

LITERATURE REVIEW

Student Teams Achievement Division (STAD) Cooperative Learning Model

The Student Teams Achievement Division (STAD) is known as one of the most practical and easy-to-implement forms of group-based cooperative learning. According to research by Tsabita et al. (2023), the implementation of this method has a significant positive impact on students. In addition to being effective in stimulating critical thinking and creativity, the STAD model also plays a crucial role in developing collaboration skills and encouraging students to support and mentor their peers.

Wulandari (2022) stated that the STAD model can increase student learning engagement. Sholikha and Alwin (2023) found improvements in cognitive learning outcomes through STAD. Tsabita et al. (2023) reported that STAD effectively improves student learning outcomes.

Mathematics Learning Outcomes

Learning outcomes are changes in student abilities after participating in the learning process, encompassing cognitive, affective, and psychomotor aspects Hartati, (2016) In mathematics learning, learning outcomes reflect students' level of mastery of mathematical concepts, principles, and procedures, as measured through evaluation activities.

The achievement of optimal learning outcomes depends heavily on the integration of both internal and external factors related to the student. According to Damyanti et al. (2022), internal elements consist of a child's prior knowledge, mental readiness, interest, and motivation. On the other hand, external elements include the qualifications of educators, the classroom climate, and the availability of resources and teaching strategies employed.

Empirical findings based on preliminary observations at UPTD SD Negeri 15 Parepare indicate that the mathematics scores of fifth-grade students have not met expectations. This problem is believed to stem from a teaching approach that remains teacher-centered, which ultimately limits students' freedom of action and participation. As a corrective measure, the implementation of the STAD cooperative learning approach is projected to stimulate student engagement while simultaneously boosting their academic achievement in mathematics.

Conceptual Framework

Findings from initial observations revealed poor mathematics achievement among fifth-grade students at UPTD SD Negeri 15 Parepare. These low scores are closely linked to a classroom environment that is overly teacher-dominated. This one-way teaching style deprives students of opportunities to collaborate, discuss, or even simply ask questions. Ultimately, concept retention is hindered, and traditional learning objectives fail to be met.

To address this passive classroom dynamic, the Student Teams Achievement Division (STAD) cooperative learning model was selected as a solution. This model facilitates the formation of mixed-ability groups, thereby encouraging students to interact, explain the material to one another, and recognize their respective responsibilities—both individually and as a group—in preparing for independent tests. Through this intensive collaborative interaction, it is hoped that there will be a surge in student motivation and engagement, leading to improved understanding and better final assessment results.

In conclusion, the implementation of the STAD model is considered a highly relevant innovation for transforming the teaching and learning environment into a higher-quality one, while simultaneously raising the math achievement levels of fifth-grade students at UPTD SD Negeri 15 Parepare.

This framework can be explained with the following scheme:



Gambar 2.1 Skema Kerangka Pikir Model Tipe *Student Teams Achievement Division*

METHODOLOGY

The design used in this study was a qualitative method in the form of Classroom Action Research (CAR). The main objective was to optimize students' mathematics learning outcomes through the implementation of the Student Teams Achievement Division (STAD) cooperative learning model. The research was conducted at UPTD SD Negeri 15 Parepare during the even semester of the 2025/2026 academic year. The participants included all 26 fifth-grade students, comprising 16 girls and 10 boys. The research procedure was carried out in two cycles, each of which consisted of four systematic steps: planning, implementation, monitoring (observation), and reflection. To collect data, the researcher utilized three main techniques. Observation was used to record the dynamics of both the teacher's and students' activities in the classroom; tests were administered to evaluate the students' mathematics competencies at the end of each cycle; and documentation served as both a record and supplementary data throughout the research process.

The data processing in this study employed both qualitative and quantitative descriptive analysis techniques. For the qualitative approach, the procedures involved data reduction, data presentation, and the formulation of conclusions to document the dynamics of teaching and learning activities in the classroom. Meanwhile, the quantitative approach focused on calculating the average scores and the percentage of students' academic achievement at the end of each cycle. The benchmarks for the success of the intervention are based on two main parameters: improvements in the quality of the teaching process and the fulfillment of the classical mastery criteria, namely when at least 76% of all students achieve a score of 75 or higher.

RESEARCH RESULT

This classroom action research was conducted in two cycles. Each cycle consisted of four main steps: planning, implementation, observation, and reflection. During the study, the Student Teams Achievement Division (STAD) cooperative learning approach was consistently applied to improve academic achievement in mathematics among fifth-grade students at UPTD SD Negeri 15 Parepare.

During Cycle I, learning activities were carried out based on the standard STAD steps. The process began with the presentation of learning objectives, an explanation of the material, the formation of heterogeneous teams, group discussions, the completion of self-administered tests, and the awarding of recognition to high-performing teams. However, monitoring data revealed uneven participation; while some students were proactive, quite a few remained passive and relied solely on their teammates' performance. This challenge resulted in test scores that did not meet the proficiency standard, necessitating an evaluation for the next cycle.

Based on these reflective findings, the teacher refined the strategy for Cycle II. The improvements included strengthening motivation, assigning more specific roles within each group, and providing extra support for students experiencing learning difficulties. These adjustments proved effective in changing the classroom dynamics; students became more interactive during discussions, were more confident in voicing their opinions, and worked more cohesively to complete the project.

Table 1. Comparison of Students Mathematics Learning Outcomes in Cycle I and Cycle II

Indicators	Cycle I	Cycle II
Number of students	26	26
Average value	73,5%	81,3%
Percentage completion	69,2%	84,6%
Number of students who completed the course	30,7%	15,3%

Table 1 shows an improvement in students' mathematics learning outcomes from cycle I to cycle II. This improvement indicates that the implementation of the STAD cooperative learning model can improve students' understanding of the material being studied. In addition to improving learning outcomes, the STAD model also increases learning activities, collaboration among students, and individual responsibility within groups.

The results of this study confirm Slavin's (2015) findings. According to him, academic achievement can be boosted through the STAD cooperative learning approach, which facilitates collaboration and interaction among students within heterogeneous teams. This empirical evidence further supports the conclusions of Pratama's (2020) study regarding the positive impact of STAD on elementary-level mathematics learning outcomes. Furthermore, these findings align with the study by Sari and Suhartono (2022), which

demonstrated the effectiveness of STAD in optimizing learning mastery while fostering active student participation in the classroom.

Based on the accumulated observational and test data from the two cycles, it can be concluded that the implementation of the Student Teams Achievement Division (STAD) cooperative learning model has proven effective. This model not only improves the quality of teaching and learning activities but also successfully boosts the mathematics scores of fifth-grade students at UPTD SD Negeri 15 Parepare.

DISCUSSION

The implementation of the Student Teams Achievement Division (STAD) model has proven successful in improving the mathematics achievement of fifth-grade students at UPTD SD Negeri 15 Parepare. This success is not measured solely by final test scores but is also reflected in the learning dynamics, which have become more participatory, collaborative, and student-centered. When the improvement measures were implemented, the level of student engagement in group discussions increased significantly; students helped one another when facing difficulties and no longer hesitated to share their ideas. This outcome confirms that group-based strategies such as STAD are highly effective in enabling each individual to contribute to the fullest extent possible in the classroom.

This improvement in learning outcomes aligns with the cooperative learning theory proposed by Slavin (2015), which states that the STAD model encourages students to learn through collaboration in heterogeneous groups, thus creating positive interdependence, individual accountability, face-to-face interaction, and social skills that support the achievement of learning objectives. Through group discussions, students have the opportunity to explain material to each other, exchange ideas, and refine their understanding of previously unmastered mathematical concepts.

The findings of this study also support Huda's (2017) opinion that the STAD model can increase learning engagement because each group member is responsible for their group's success. The inclusion of individual quizzes and group awards encourages students to study more diligently and participate actively during the learning process. Thus, learning is no longer dominated by the teacher, but rather centered on student activity.

These research findings are consistent with those of Pratama and Mawardi (2020), who concluded that implementing the STAD model can improve elementary school students' mathematics learning outcomes through effective group collaboration. Furthermore, research by Sari and Suhartono (2022) also showed that learning using the STAD model produces better learning outcomes than conventional learning because students are more active in constructing knowledge through interactions with their group mates.

Based on these findings, it is clear that the success of implementing the STAD model is influenced not only by systematic learning steps but also by creating a learning environment that encourages positive interactions, cooperation, and individual responsibility. Therefore, the STAD type

cooperative learning model can be an effective alternative to improve the quality of mathematics learning in elementary schools, especially in the material on the area of flat shapes.

CONCLUSIONS AND RECOMMENDATIONS

Based on the results of classroom action research that has been carried out in two cycles, it can be concluded that the implementation of the Student Teams Achievement Division (STAD) cooperative learning model is effective in improving the mathematics learning outcomes of fifth grade students of UPTD SD Negeri 15 Parepare. The implementation of the STAD model is able to create a more active, collaborative, and student-centered learning process through group discussion activities, helping each other in understanding the material, and giving individual and group responsibilities. Improvements in the learning process in each cycle have an impact on increasing learning activities and the completeness of mathematics learning outcomes to achieve the established success indicators. These findings indicate that the STAD cooperative learning model is worthy of being used as an alternative for mathematics learning in elementary schools. Therefore, teachers are advised to implement the STAD model continuously by adjusting the characteristics of the material and students, while the school is expected to support the implementation of innovative learning models by providing learning facilities and improving teacher competencies. Further research is recommended to develop the application of the STAD model in materials, educational levels, or combine it with innovative learning media to obtain more comprehensive results and can strengthen the findings of this study.

ADVANCED RESEARCH

This study has several limitations. First, the study was only conducted in one class, namely fifth-grade students of UPTD SD Negeri 15 Parepare, so the results cannot be generalized to different school conditions or educational levels. Second, the study was only conducted in two cycles with mathematics material on the topic of area of flat shapes, so the effectiveness of the Student Teams Achievement Division (STAD) cooperative learning model on other mathematics materials cannot be fully understood. Furthermore, this study only focused on improving learning outcomes so it did not examine other aspects, such as critical thinking skills, problem solving, learning motivation, or students' collaboration skills.

Therefore, further research is recommended to apply the Student Teams Achievement Division (STAD) cooperative learning model to different mathematics materials, at more diverse educational levels, or with a wider number of research subjects. Future research could also combine the STAD model with digital learning media or other innovative learning approaches to examine its impact on various aspects of student abilities for more comprehensive research results.

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