

# Proceedings of International Conference on Islamic Education and Science Development (ICONSIDE)

Fakultas Tarbiyah dan Keguruan, Universitas Islam Negeri Mataram, Indonesia

Mataram, 27 May 2023 Available online at <https://proceeding.uinmataram.ac.id/>

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## Teachers' Efforts to Improve Students' Mathematics Learning Outcomes Through the Use of Teams Assisted Individualization Cooperative Learning Models

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### ABSTRACT

Cooperative learning is a learner-centered learning process, where students share knowledge in groups. The cooperative learning model helps students acquire academic content and skills. Team Assisted Individualization (TAI) has a rationale for adapting learning that is able to capture the meaning of individual differences related to students' abilities or achievements. Several published studies have explored the TAI cooperative learning model, but studies focusing on the subject of elementary school mathematics will be undertaken in this study. Therefore the purpose of this study is to describe the application of the use of TAI cooperative learning in improving the mathematics learning outcomes of second-grade elementary school students, as well as to analyze the impact of applying the TAI cooperative learning model in improving student mathematics learning outcomes. This study has shown that the TAI cooperative learning model is proven to be able to improve second-grade students' mathematics learning outcomes in one of the public elementary schools in South Tangerang City, Banten. Where the final results of the study showed an increase in students' math scores starting from pre-cycle to cycle 2 and reaching a maximum of 37 students or 90.2% of 41 students obtaining a complete learning achievement score. Meanwhile, the four students who had not obtained mastery learning were given re-teaching and enrichment according to the needs of each student.

**KEYWORDS:** the Team Assisted Individualization Type Cooperative Learning Model, academic content and skills, achievements

## INTRODUCTION

Students in cooperative learning situations are encouraged and required to work together on the same task, and they must coordinate their efforts to complete the task. The same goals for children in groups make learning activities more cooperative (Arends, 2013). Cooperative learning models played a dynamic role in improving students' achievement in mathematics (Hossain et al, 2018). Cooperative learning is a learner-centered learning process, where students share knowledge in groups (Rohmah et al., 2022). The cooperative learning model helps students acquire academic content and skills (Hermawan et al., 2020; Sudin et al., 2021). Cooperative learning is intended to provide time and structure for students to think and work on the topic to be studied (Busahdiar et al., 2022). Cooperative learning is a method that emphasizes student participation and activity to find the subject matter to be studied (Rosfiani et al., 2021).

As the application of cooperative learning techniques in education can be a challenge, especially in the context of classrooms comprising large numbers of students, the interest to identify factors that affect success and how students construct knowledge effectively in the implementation of cooperative learning is needed (García-almeida & Cabrera-nuez, 2018).

Team Assisted Individualization (TAI) basically has a rationale for adapting learning that is able to capture the meaning of individual differences related to students' abilities or achievements. TAI is included in cooperative learning. In the TAI learning model, students are placed in heterogeneous small groups (4 to 5 students). Furthermore, the teacher provides individual assistance for students who need it. Each member is given an individual test without the help of other members. While undergoing this individual test, the teacher must pay attention to each student. Scores are not only assessed by the extent to which students are able to take the test but also by the extent to which they are able to work independently (not cheating) (Priansa, 2017: 351).

Rewards are given to groups that are able to answer more questions correctly and are able to complete homework well. The teacher gives additional points (extra points) to students who are able to obtain an average score that exceeds the minimum completeness criteria in the final exam. Because in the TAI learning model, students have to check each other's work and do assignments based on a certain set of questions, the teacher can provide explanations about questions that are generally considered complicated by students. In this TAI learning model, individual accountability, equal opportunities for success, and motivational dynamics are the main elements that teachers must emphasize (Priansa, 2017: 351).

Stages of Implementation of the TAI Type Cooperative Learning Model. a) The teacher gives assignments to students to study learning material individually that has been prepared by the teacher; b) The teacher gives individual quizzes to students to get a basic score or initial score; c) The teacher forms several groups. Each group consists of 4-5

students with different abilities, both ability levels (high, medium, low) if possible group members come from different races, cultures, ethnicities, and gender equality; d) The learning outcomes of individual students are discussed in groups. In group discussions, each group member checks the answers of a groupmate; e) The teacher facilitates students in making summaries, directing, and giving confirmation to the learning material that has been studied; f) The teacher gives quizzes to students individually; g) The teacher gives awards to groups based on the acquisition of an increase in individual learning outcomes from basic scores to quiz scores (Priansa, 2017: 356).

Several published studies have explored the Team Assisted Individualization (TAI) cooperative learning model, but studies focusing on the subject of elementary school mathematics will be undertaken in this study. Therefore the purpose of this study is to describe the application of the use of Team Assisted Individualization (TAI) cooperative learning in improving the mathematics learning outcomes of second-grade elementary school students, as well as to analyze the impact of applying Team Assisted Individualization (TAI) cooperative learning model in improving student mathematics learning outcomes.

The contribution to this research is to assist teachers in applying the Teams Assisted Individualization cooperative learning model, as well as assisting teachers in compiling Mathematics learning topics that are relevant to student's needs and interests, interesting, that provide new insights and knowledge, and challenge students' creative thinking.

## **METHOD**

This classroom action research was carried out through four stages starting from planning, implementing, observing, and reflecting. The participants in this study were second-grade students and teachers of an elementary school in a public school in South Tangerang, Indonesia. A total of 41 students consisting of 19 boys and 22 girls were involved in the study. Data was collected through tests and observations. The test is where the score is not only assessed based on the extent to which students are able to do the test but also the extent to which they are able to work independently. While observations were made on the performance of teachers and students during the Team Assisted Individualization (TAI) stage.

## **RESULT AND DISCUSSION**

### **Pre-Cycle**

Reflection discusses strengths and weaknesses. Reflection on the pre-cycle shows that student learning outcomes are unsatisfactory and do not meet the minimum learning completeness standard, namely a score of 80. The results of the pre-cycle show that out of 41 students, 25 students are incomplete, or 60.9% below the completeness score, while the

other 16, or 39% got a completeness score. Based on the results of these reflections, it is necessary to take action to improve learning outcomes in cycle 1.

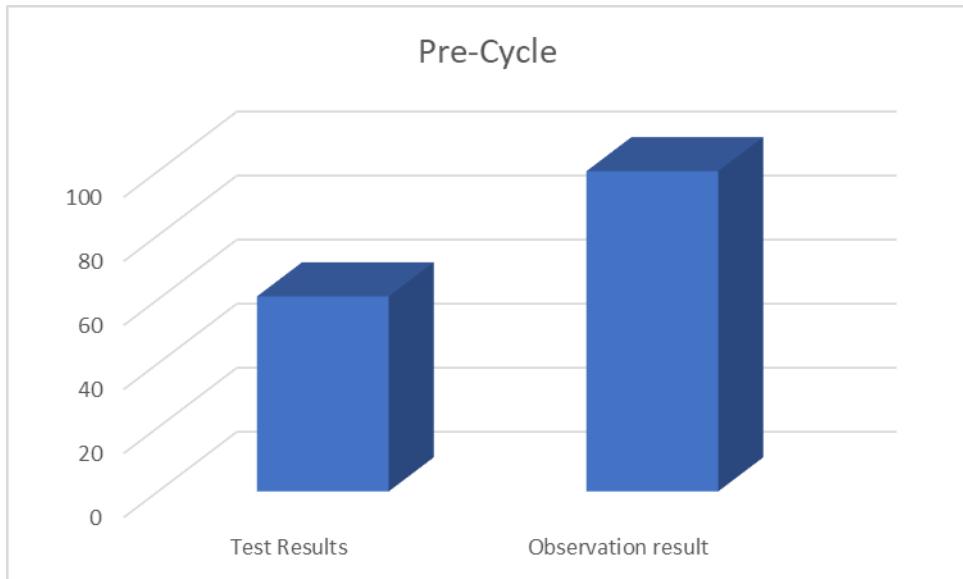


Figure 1. Graph of Student Learning Outcomes and Teacher Performance Observations

### Cycle 1

Data on student learning outcomes in cycle 1 showed that 19 students achieved a mastery learning score of 46.3%, while the other 22 students had not completed or around 53.6%. Based on the reflection results, the teacher feels the need to take corrective action to improve student learning outcomes and teacher performance.

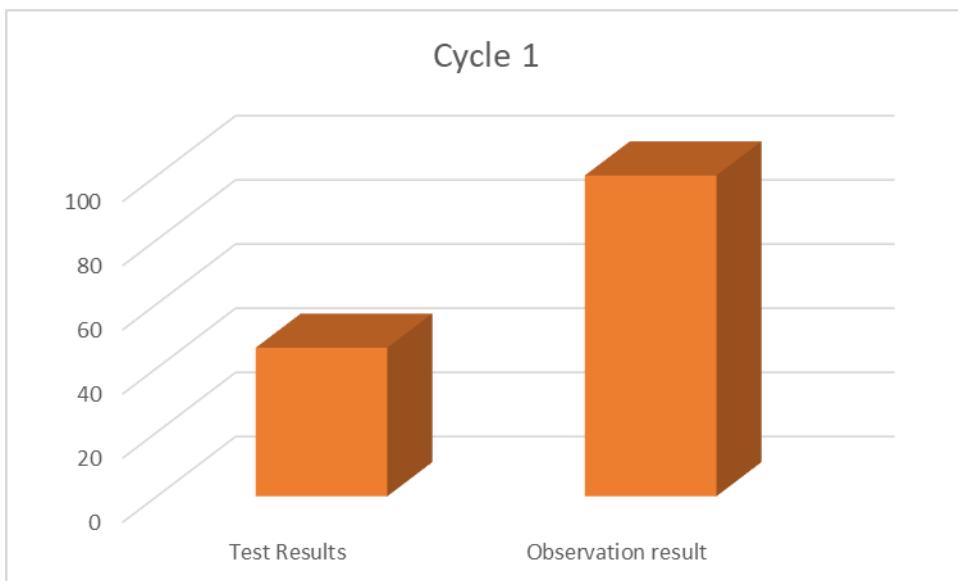


Figure 2. Graph of Student Learning Outcomes and Teacher Performance Observations

### Cycle 2

The results of the second cycle of reflection showed that the student learning outcomes were satisfactory and fulfilled the learning completeness criteria 80. The learning achievement data showed that 37 students completed or approximately 90.2%, while the other four students did not complete or around 9.8%. The teacher decided to stop the research action and carried out a re-teaching and enrichment program for the four students.

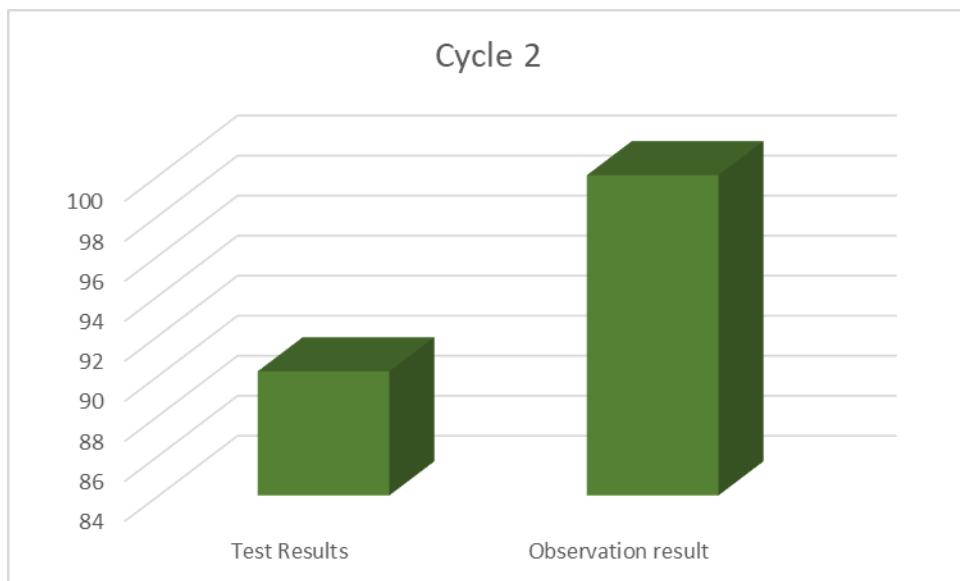


Figure 3. Graph of Student Learning Outcomes and Teacher Performance Observations

Comparative data on mathematics learning outcomes for grade II students in pre-cycle, cycle 1, and cycle 2, on the application of the Team Assisted Individualization (TAI) cooperative learning model, is shown in Figure 4 below.

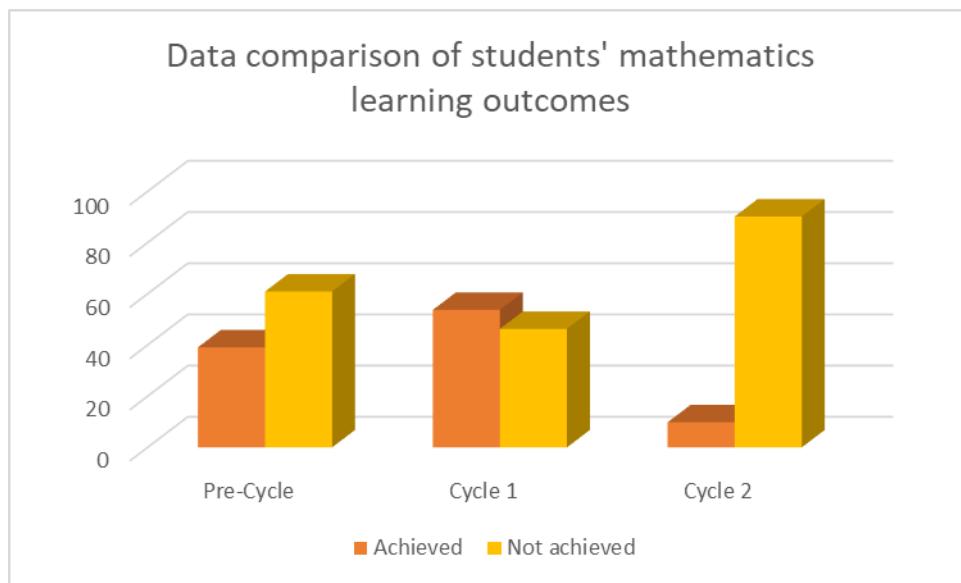


Figure 4. Data on second-grade students' mathematics learning outcomes in the pre-cycle, cycle 1, and cycle 2

The results of this study are also in line with research conducted by Hossain (2018) which found that students by working together in small groups were able to gain academic achievement by increasing their interpersonal competence. Overall, cooperative learning models such as Learning Together, STAD, TGT, TAI, CIRC, GI, Jigsaw, and Complex Instruction work well for all types of students, regardless of ability level, learning style, ethnic background, age, and gender. Other results from this study also agree with the findings of previous research which states that cooperative learning has a significant effect on the level of students' democratic attitudes (Erbil, 2017). As said by Hossain (2018) that the use of cooperative learning is an effective pedagogy with the aim to improve students' mathematics achievement and communication skills.

## CONCLUSION

This study has shown that the Teams-Assisted Individualization (TAI) cooperative learning model is proven to be able to improve second-grade students' mathematics learning outcomes in one of the public elementary schools in South Tangerang City, Banten. Where the final results of the study showed an increase in students' math scores starting from pre-cycle to cycle 2 and reaching a maximum of 37 students or 90.2% of 41 students obtaining a complete learning achievement score. Meanwhile, the four students who had not obtained mastery learning were given re-teaching and enrichment according to the needs of each student.

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