



Efforts To Improve Mathematics Learning Achievement Addition Material Through Team Assisted Individualization (TAI) Type Learning

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ABSTRACT

The purpose of this study was to improve learning outcomes in mathematics addition material for grade I students of SD N Gunungsaren Srandakan Bantul semester 2 of the 2022/2023 school year. This research includes classroom action research. The subjects of this study were all class IA students at SD N Gunungsaren totaling 22 students. Data collection techniques used are observation and tests. The research instruments used were observation sheets and written test questions. The classroom action research model used is the Stephen Kemmis and Robert Mc Taggart model. Classroom action research was conducted in two cycles with each cycle being carried out in two meetings. Data analysis used is descriptive quantitative. The results showed that grade I students at SD Gunungsaren Srandakan Bantul experienced an increase in learning outcomes. The class average value increased, in the range of scores 0-100 from the pre-action value of 65 to 74.55 in cycle I with details that got more than or equal to 70 there were 10 students (45.45%) while those who got scores less than 70 there are 12 students (54.54%). In cycle II the average score also increased to 82.27 with details of those who scored more than or equal to 70 there were 16 students (72.72%) while those who scored less than 70 were 6 students (27.27%). Based on these results, it shows that the Team Assisted Individualization (TAI) Cooperative Learning Type can improve the learning achievement of the firstgrade students of SD N Gunungsaren in learning mathematics, especially the addition material.

Keywords: *learning achievement_1; cooperative learning_2; TAI tipe learning_3.*

1. INTRODUCTION

Education is very important in the life of every human being. It is a continuous activity in everyday life, both formally and informally. Along with developments and demands of the times, various skills and expertise as well as improvements in quality must be in accordance with science, social, and technology. The implementation of education itself cannot be separated from the educational goals to be achieved, because whether or not educational goals are achieved is a measure of the success of educational implementation [1], [2]. Good quality education can produce graduates who have the basic ability to learn and practice, so that they can become pioneers in reform and agent of change. Improving the quality of education can be done in various ways, for example conducting, developing

and improving the curriculum, organizing teachers, providing main or supporting books, and improving learning methods.

Mathematics is one of the subjects that plays a very important role in everyday life. It is a basic of numeration skill. Through a good mathematics education in a learning activity, it is possible for students to get various kinds of provisions in facing challenges in the current and the next era of global world. Students who have ability to think critically, logically, carefully, systematically, creatively and innovatively are some them who achieve the competence that can be developed and improved through mathematics education[1], [3], [4]. Mathematics education itself always have tight relationship with mathematics learning.

Mathematics learning should be designed to provide opportunities for students to develop their abilities to the maximum skills from the material they study at the moment. With the increasing number of media and learning resources that can be used in learning mathematics, students do not expect much from teachers. Teachers just participate as facilitators, so the students can be given independence to learn by utilizing various learning media and resources.

Learning mathematics requires active students while the teacher is only a facilitator to assist students in learning. There are many various new concepts and insights about learning in schools have emerged and developed along with the rapid development of science and technology. Teachers as educators who occupy strategic positions in the framework of developing human resources, are required to continue to follow the development of new concepts in the world of learning.

In the teaching and learning process there are several weaknesses that affect student learning outcomes to decrease. Classroom Action Research (CAR) is a type of action research where the source of the problem comes from the learning process in class, and is felt directly by the teacher concerned so it is difficult to justify if there is an assumption that problems in classroom action research arise from the engineering of researchers. In CAR, researchers or teachers can see the learning practices themselves or with other teachers can conduct research on students in terms of aspects of their interaction in the learning process. Teachers can reflexively analyze and synthesize activities carried out in class.

From the results of class observations, it is known that the mathematics learning process for grade I students of SD N Gunungsaren for the 2022/2023 academic year found weaknesses that must be resolved, including the following:

- 1) Students are passive and pay little attention to the teacher's explanations and instruction in each lesson;
- 2) Students are busy and noisy during learning activity;
- 3) Students felt saturated and bored with monotonous learning;
- 4) Students' concentration and understanding are lacking, not maximum in every mathematics lesson;
- 5) Student learning outcomes are low, can be seen from data of achievement value they gained.

Based on the case background above, the problem formulation in this research is as follows: Can the Team Assisted Individualization (TAI) cooperative learning model improve the mathematics learning outcomes of grade I students at SD N Gunungsaren in the subject matter of addition?

And based on the problem formulation above, the aim of this research is to: Improve the mathematics learning outcomes of grade I students of SD N Gunungsaren for the 2022/2023 academic year through

Team Assisted Individualization (TAI) type cooperative learning for the subject matter of addition. And the research hypothesis is that cooperative learning with the Team Assisted Individualization (TAI) type can improve mathematics learning achievement, especially the addition material in grade I at SD N Gunungsaren.

2. METHOD

The research conducted was classroom action research (CAR) with a quantitative descriptive method. This research was conducted in 2 cycles and each cycle consisted of activities: learning planning, learning actions, learning observations, and learning reflection. This research uses the spiral model from Kemmis and Taggart which was developed by Stephen Kemmis and Robert Mc Taggart which consists of two cycles and each cycle uses four action components, namely planning, action, observation and reflection. in one intertwined spiral[5], [6].

The data obtained in this research is in the form of observation sheets in the learning process, namely observations of students learning and observations of classroom management and teachers teaching, as well as tests of student learning outcomes at the end of the cycle. What is analyzed is analysis of student learning observation data and observation data of classroom management and teacher teaching, as well as student learning outcomes tests. The analysis uses the average results of observations and tests, then the average results are described for each instrument. This descriptive analysis is used to describe the characteristics of research data and answer the problems stated in the problem formulation. [7], [8] Descriptive analysis used in this study for student achievement data is the minimum score, maximum score, average, and percentage. Based on the criteria for learning completeness, if you reach a minimum score of 70 on a scale of 100, whereas for learning observations and observations of teachers teaching and classroom management, the achievement score is said to be successful if the average percentage of students reaches more than or equal to good (3) or 75%.

Observation data that has been obtained is calculated and then presented using the formula:

$$\text{Score Percentage} = \frac{\sum \text{achieved score}}{\sum \text{maximum score}}$$

3. RESULT AND DISCUSSIONS

This research was carried out at SD N Gunungsaren, whose address in Gunungsaren, Trimurti, Srandakan, Bantul, DIY. SD N Gunungsaren has a fairly good physical environment. This can be seen from the condition of the building which is still sturdy, the school yard is clean, and the layout is quite neat. In the

2022/2023 academic year, this school has a total of 187 students, a principal, and 16 teachers, namely 11 class teachers, 2 Islamic Religious Education teachers, 1 Local Content teacher and 2 Sports Education teachers.

In addition, this school has a caretaker. Grade I of SD N Gunungsaren totaled 22 students with 10 male students and 12 female students.

Table 1 Student Pre-Action Assessment Results

Component	Result
Number of students	22
Highest score	90
Lowest score	30
Average score	65
Percentage of students who complete	31,82%
Percentage of students not complete	68,18%

This CAR was carried out on May 2-June 3 2023. The results of the pre-action quantitative descriptive analysis carried out on May 4 2023 showed that students' mathematics learning achievements before being subjected to learning actions used the TAI learning model. The class average is 65 with the highest score being 80 and the lowest score being 40. There are 7 students (31.82%) who have fulfilled the Criteria for Completion of Learning Objectives (CCLO) 70. This can be seen from the frequency of students who score 70 and above. Meanwhile, 15 students (68.18%) did not fulfill the CCLO. This can be seen from the number of students who scored 70 and below. The student's initial score is used as the initial score for the student's individual progress after following mathematics learning material on adding numbers above 20 to 99.

Table 2 Results of Student Assessment Cycle I

Component	Result
Number of students	22
Highest score	100
Lowest score	50
Average score	74,55
Percentage of students who complete	45,45%
Percentage of students not complete	54,55%

Cycle I was held on May 8 and 15 2023. The results of the cycle I tests were 10 students (45.45%) who had completed and 12 students (54.55%) who had not completed. Meanwhile, the highest value is 100 and the lowest value is 50. So, there is still quite a difference between the highest value and the lowest value. The average test result is 74.55. students who completed the questions in cycle I were 45.45%, while students who did not complete were 54.55%. This shows an increase

in students who completed cycle I by 13.69% compared to pre-action. From the results of the actions of the first cycle which have been decomposed as above, it can be concluded that the results of learning mathematics in the material for adding two-digit numbers up to 99 have increased. But the actions in cycle I did not meet the target value to be achieved. So, the research must be continued in the second cycle of action.

Table 3 Results of Student Assessment Cycle II

Komponen	Hasil
Number of students	22
Highest score	100
Lowest score	60
Average score	82,27
Percentage of students who complete	81,82%
Percentage of students not complete	18,18%

And finally Cycle II was held on May 19 and 25, 2023. As a result, students who completed the questions

in cycle II were 81.82%, while students who had not completed were 18.18%. This shows that there is an

increase in students who complete in cycle II by 36.36% compared to cycle I. From the results of the actions of cycle II which have been decomposed as above, it can be concluded that the results of learning mathematics in the addition material have increased. This increase has met the target to be achieved. Thus, the research was no longer continued or ended.

Many similar researches also have been done by any other researchers. They focused their researches on the application of Team Assisted Individualization as cooperative learning to improve student competence in some kinds of learning subject.

The application of the cooperative learning model of TAI type can improve the learning outcomes of grade VI elementary school students of Tombolok Gowa in shape material. The strategy of framing and team assisted individualized instruction were effective methods of learning mathematics. They had the potentials of improving students' achievement in mathematics. [9], [10] The result showed that the using of *Team Assisted Individualization* learning model can improve learning outcomes of students in social studies. The TAI learning model provides better learning achievement results than the direct learning model. The result of the data analysis showed an increase in students' mathematical critical thinking skills, which were interpreted moderately after implementing the assisted individualization team learning model. [11]–[13] Based on the class action research results, the cooperative learning model of the Team Assisted Individualization can improve social interaction and student learning achievement in computer materials and network-grade X-9 Vocational High School 1 Padang at the academic year of 2019/2020. The implementation of cooperative learning model of the Team Assisted Individualization with modules in grade X students of Computer Network subjects, implemented in two cycles, has succeed to improve the student learning outcomes. Team Assisted Individualization (TAI) gave positive effect towards mathematics learning achievement. It gave better mathematics learning achievement than direct learning. There was different

mathematics learning achievement between levels on interpersonal intelligence. There was no interaction between interpersonal intelligence and learning models toward student's mathematics learning achievement. TAI could be an alternative learning model to improve students' learning achievement in geometry. The application of cooperative learning models can influence the increase in mathematics learning outcomes and student learning activities. Using a cooperative model type TAI (Team Assisted Individualization) can improve creativity and student achievement. Student creativity seen from all indicators of creativity has increased. [14]–[18]

The mathematics communication ability has a significant correlation with the cooperative learning type TAI, because in the class using the cooperative learning, the students are expected to help each other, to mutually discuss and argue, to sharpen the knowledge they have at the current time, and to overcome the gap in the understanding among students. Team Assisted Individualization learning model with realistic mathematics approach is more effective than expository learning model with deductive approach to the mathematical problem-solving ability of Godean 3 Junior High School students. [19], [20] The success of the Team Assisted Individualization learning model which has had a positive influence on students' mathematical communication skills on two-variable linear equation systems class VIII SMP Negeri 11 Singkawang. Team Assisted Individualization learning model as an alternative learning model implemented in schools, because the Team Assisted Individualization learning model can influence on students' mathematical communication skills. [21], [22] There is an influence of the application of the Team Assisted Individualization (TAI) Cooperative Learning Model on students' ability to mathematical understanding concepts judged from the initial mathematics knowledge of grade VIII Munawaroh Madrasah Tsanawiyah Students in Pekanbaru.



Figure 1. Students discussion

The Team Assisted Individualization Type Cooperative Model with Peer Tutors has succeeded in improving students' mathematical abilities. After comparing the initial values, the application of the Team Assisted Individualization Type Cooperative Model with peer tutors improves student learning outcomes so that this model is suitable for application in learning. It is recommended for teachers to use the Team Assisted Individualization cooperative learning model to make it easier for students to learn. The research had been done to analyze the understanding of mathematics competence about numbers using TAI cooperative learning model (TAI) of grade IV students Madrasah Ibtidaiyah Al Hidayah Kebon IX Muaro Jambi. [23]–[26]

The learning model of Team Assisted Individualization (TAI) by semi-concrete media had a significant effect on the mathematics knowledge competency on the fifth grade of Elementary School at Region I Kuta Bali. TAI strategy with graphical software is more effective in improving the mathematical problem-solving ability than conventional learning. [27]–[29]

The use of the TAI model assisted by GeoGebra software in mathematics learning can improve students' mathematical problem-solving abilities compared to conventional learning. In the TAI model, students will be motivated more actively and participatively in their learning groups, which is reinforced by the use of GeoGebra graphics software that trains representation and problem solving based on graphical information provided by software. The cooperative learning type TAI was found effective to teach 3D geometry at the first grade of MA Ismailiyah, Jombang. However, based on the analysis of inferential statistic, the students' mathematical learning outcome using cooperative

learning type TAI on 3D geometry was found better than using conventional learning model. [30], [31]

The TAI instructional strategy is effective in improving problem solving skills, learning activeness and learning achievement in mathematics.

Applying the Team Assisted Individualized (TAI) type of cooperative learning model assisted by interactive media had an influence on the results of students' mathematical communication skills compared to the control group that used scientific learning in lessons. mathematics class VII SMP Negeri 6 Lhokseumawe. [23], [32], [33]

4. CONCLUSION

In cycle I, students who received a complete score and achieved CCLO scores were 10 students or 45.45% of the total number of students, while in cycle II students who received complete scores and achieved CCLO scores were 18 students or 81.82% of the total. all students. The average value of learning outcomes in cycle I and cycle II also increased by 36.36%, from 74.55 to 82.27 so that based on indicators of success that if the average percentage of students achieves more than or equals well (3) or 75%, it can be concluded that this learning was successful.

AUTHORS' CONTRIBUTIONS

AUTHOR 1 IS THE RESEARCHER OF THIS ARTICLE AND AUTHOR 2 IS THE SUPERVISOR IN THIS RESEARCH

ACKNOWLEDGMENTS

Thanks to the lecturers at PGRI University Yogyakarta who have provided a place for writers to take part in seminars as well as a place to write scientific articles.

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- 150 H. Maryatun and M. Fauziah
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