



Improving Mathematics Learning Outcomes Using the STAD Type Cooperative Learning Model in Grade IV Students of Kalipucang Elementary School

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ABSTRACT

This class action research was carried out from the findings experienced by the author when self-reflecting on the learning outcomes of grade IV students of Kalipucang Elementary School. Learning results show that students' abilities in mathematics lessons are still low, learning activities are monotonous, lack of student involvement, and students who achieve learning outcomes have not met the target. This study aims to determine the effect of the STAD-type cooperative learning method on mathematics lessons. A distinctive feature of the STAD type is that students in heterogeneous groups are responsible for the outcome of discussions. Students who have high learning abilities become peer tutors for other group members. The results showed a significant increase after students conducted learning with the STAD-type cooperative learning method. In the pre-cycle that meets the learning outcomes, there are 3 students, in cycle 1 it increases to 9 students, and in process 2 increases to 15 students. Based on this research, mathematics learning with the STAD-type cooperative learning model can improve mathematics learning outcomes in grade IV students of Kalipucang Elementary School.

Keywords: Cooperative Learning Model, Type STAD, Learning Outcomes

1. INTRODUCTION

Mathematics subjects in every school area are considered the most difficult for students. They think learning mathematics requires high concentration and high thinking. The opinion of the student is not entirely correct. This condition can be influenced by several factors including the lack of methods in delivering mathematical material [1]. Different thinking patterns of students in one class require teachers to be able to adjust to these patterns [2]. Teachers still often deliver material in separate styles such as using lecture methods only, group work only, or individually [3]. In addition, teacher involvement is still dominant in the mathematics learning process [4], so students are only listeners in the classroom. This makes teaching and learning activities less interesting and monotonous. Even though elementary school students are students with more energy and need exploration in thinking [5].

In Kalipucang Elementary School, especially in grade IV, mathematics subjects are less attractive to students. They are less motivated to learn math. This happens because the method of learning mathematics is still conventional and rarely involves student activity. Teachers often deliver material through lectures so that students become bored, and less excited, and teaching and learning activities are not lively. If the learning method as above is still carried out, it will have an impact on students low understanding and the evaluation results do not meet the passing standards.

This problem can be overcome by the way teachers must update the way of teaching and the method and model [6]. Researchers choose to use cooperative learning with the aim that students can communicate with each other and create good interactions [7]. In this study researchers used cooperative learning type *Student Teams Achievement Divisions* (STAD).

The implementation of this strategy is expected to improve students' mathematics learning outcomes. This type of STAD cooperative learning emphasizes students with different abilities [8]. This model can be said to be the simplest and easiest to apply in the classroom [9]. STAD type cooperative learning uses a small group system consisting of 3-4 people who have different backgrounds, genders, and academic abilities-different [10]. Through STAD type cooperative learning students more easily understand the concept of mathematical material because the teacher provides extensive opportunities for students to discuss, speak, and respect the opinions of his friends [11]. When students have discussions, students dare to express opinions and students dare to argue and are active in learning. The use of this model is very helpful for students, this is because in the division of groups of students who have high abilities will provide guidance for students who has low abilities [12]. The STAD type is a model that emphasizes the achievements of teams or groups with reference to the number of individual scores of each group [13].

The use of this model will be able to improve student learning outcomes because of the high interaction pattern between students and teachers as facilitators. These interactions stimulate students to think creatively and attempt to understand the material more productively. In line with research from I Made Suardiana which shows that STAD type cooperative learning is able to improve student learning outcomes in mathematics subjects. Further relevant research was conducted by Ari Septian regarding the application of the STAD learning model which is effective in improving the understanding of mathematical concepts [14]. The use of the STAD learning model also developed well and student attitudes showed positive results.

The results of the above research can be concluded that STAD-type cooperative learning can improve student mathematics learning outcomes, increase student activity and foster student attitudes that positive. Based on the results of this study, researchers attempted to conduct research aimed at improving mathematics learning outcomes of grade IV students of Kalipucang Elementary School through the application of cooperative learning with the STAD model.

2. METHOD

This study used classroom action research (PTK). The stages in PTK use spiral models from Kemmis and Mc Taggart. This model consists of four stages, namely planning, implementing actions, observation, and reflection [15]. The model can be described in the figure below.

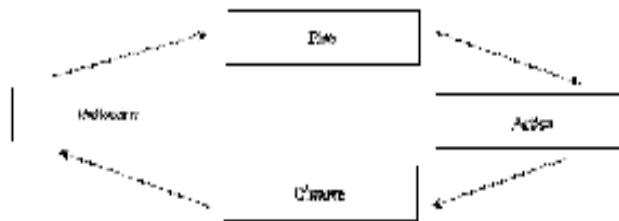


Figure 1. Stages in PTK [16]

The subjects in this study were grade IV students of Kalipucang Elementary School for the 2023/2024 academic year totaling 17 people with details of 9 male students and 8 female students. The object of this study is the learning outcomes of grade IV students of Kalipucang Elementary School with the application of STAD type cooperative learning. This research consists of cycle I and cycle II with each cycle consisting of four stages, namely planning, action, observation, and reflection.

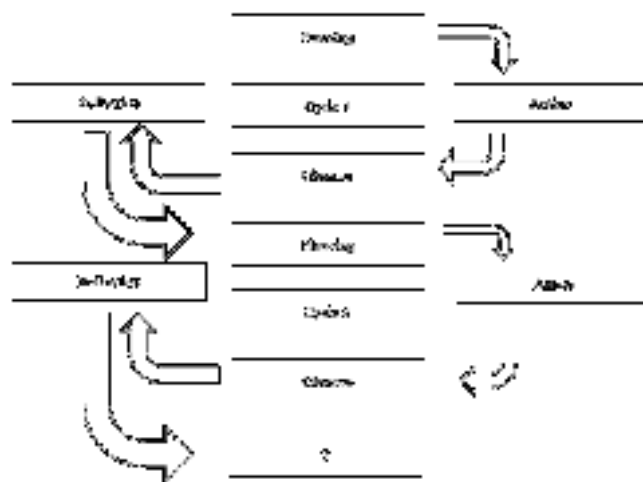


Figure 2. Stages of research

The activities in the picture above can be explained as follows:

Plan

At this stage the researcher will explain what, when, why, where, who and how the action was performed.

Action

At this stage is the form of implementation of the design that has been prepared. Researchers must understand that classroom actions must be in accordance with what has been formulated and still apply norms and not made up.

Observation

This stage is the process of collecting information carried out by researchers.

Reflection

This stage is intended to study all the actions already passed.

An indicator of the success of this study is if there is a change in student learning outcomes. In this study, researchers collected data by providing learning tests according to the material being studied. Written tests can be interpreted as questions given to research subjects to complete cognitive tasks. The focus in a given cognitive task is what is known, the ability to learn, select, and the ability to do something. In this study, the test was used to determine the results of learning mathematics in the form of essay questions. The results of the student tests are collected to be processed with learning outcomes at Kalipucang Elementary School.

3. RESULTS AND DISCUSSION

The results of this study were sourced from data analysis during the research process in class. This research was carried out at Kalipucang Elementary

School with the research subjects of grade IV students totaling 17 students. The implementation of this research aims to improve student learning outcomes in mathematics subjects with STAD type cooperative learning. Based on the results of observations of learning activities in class, several problems were found including low student learning outcomes so that they did not meet the learning outcomes in the lesson mathematics.

PreCycle

Before making learning improvements, researchers observe learning in the classroom. This observation is made by looking at students attitudes during mathematics learning and seeing the results of the grades obtained by students. During observations, it is known that student learning outcomes in mathematics lessons have not reached learning outcomes. This is reinforced by the teacher's teaching style which is monotonous and less involving students in learning so that students are less interested in the material presented. In the precycle, the learning outcomes of grade IV students in mathematics lessons can be seen in the following table.

Table 1. Learning precycle grade IV, mathematics students

No	Value Interval	Frequency
1	20-41	4
2	42-55	4
3	56-69	6
4	70-85	3
5	85-100	0
Sum		17

Judging from the table above, it shows that out of 17 children, there were only 3 children who were declared complete learning with a score of >70 or 17.67%, compared to 14 incomplete students or 82.35%. From these data, it can be seen that the learning target has not been achieved because the completed students are still under 75% of the number of grade IV students.

Cycle 1

In the implementation of cycle I based on there is a pre-cycle analysis to improve learning. In the implementation of cycle 1, changes in mathematics learning outcomes have been seen. Data on student mathematics learning outcomes are presented in the table below.

Table 2. Learning outcomes of grade IV mathematics students cycle 1

No	Value Interval	Frequency
1	20-41	0
2	42-55	4
3	56-69	7
4	70-85	5
5	85-100	4
Sum		17

Based on the data above, there was an increase in mathematics learning outcomes of grade IV students. The number of students who met the learning outcomes was 9 children with a percentage of 52.94%. Judging from the success achievements in the initial plan, the learning outcomes of grade IV students in mathematics lessons have not been fully achieved. The next step is for researchers to immediately take action to improve

learning with the hope that students are able to understand the material well.

Cycle 2

Looking at the results of cycle 1 that have not been maximized in learning, in cycle 2 researchers focus on improving student learning outcomes. The mathematics learning outcomes of grade IV students can be seen in the following table.

Table 3. Learning outcomes of grade IV mathematics students cycle 2

No	Value Interval	Frequency
1	20-41	0
2	42-55	1
3	56-69	1
4	70-85	7
5	85-100	8
Sum		17

After improvements were made in cycle 2, no students scored 20-41, scored 42-55 as many as 1 student, scored 56-69 as many as 1 students, scored 70-85 as many as 7 students, and scored 85-100 as many as 8 students. The data above shows significant changes to the implementation of learning in cycle 2. Teachers in carrying out learning are increasingly flexible and give a large portion to students in discussing and solving problems themselves in groups. The learning process using cooperative learning with the STAD type is proven to have a significant impact on the learning outcomes of grade IV students in mathematics lessons. The classroom atmosphere comes alive with students discussing and positive interactions occurring, which has an impact on improved student learning outcomes. Based on the results obtained by these students, this class action research ends in cycle 2.

4. CONCLUSION

The results of the study above prove that mathematics learning with the STAD type cooperative learning model can improve student learning outcomes. In cycle 1 there are still 8 students who have not achieved learning achievements. In cycle 2, there is an increase in the ability to understand mathematical material. This can be seen from the students whom the learning achievements of 15 self-students.

The suggestion that can be put forward in this study is that teachers should start implementing cooperative learning, one of which is the type of STAD that can increase student understanding, especially in mathematics. Teachers should conduct classroom action research to find out the advantages and disadvantages of learning that has been done so that learning is of higher quality.

AUTHORS' CONTRIBUTIONS

RAW and lecturer DG both came up with the idea of classroom action research. Risa analyzed the problems that occurred in the classroom and created the background. Dhiniaty Gularso contributed to the methods used in the study. Both authors analyzed the work done. Then they discuss the results and conclusions of the research.

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REFERENCES

- [1] A. Cunska and I. Savicka, 'Use of ICT Teaching-Learning Methods make School Math Blossom', *Procedia - Social and Behavioral Sciences*, vol. 69, pp. 1481-1488, Dec. 2012, doi: 10.1016/j.sbspro.2012.12.089.
- [2] S. S. Olimov and D. I. Mamurova, 'Directions For Improving Teaching Methods'.
- [3] A. N. Savira, R. Fatmawati, and M. R. Z, 'Peningkatan Minat Belajar Siswa Dengan Menggunakan Metode Ceramah Di Sekolah Dasar Islam Bandar Kidul Kecamatan Mojoroto Kota Kediri', *F_M*, vol. 2, no. 2, Jun. 2020, doi: 10.30762/f_m.v2i2.2294.
- [4] E. Juniati, 'Peningkatkan Hasil Belajar Matematika Melalui Metode Drill Dan Diskusi Kelompok Pada Siswa Kelas', *Scholaria*, vol. 7, no. 3, p. 283, Sep. 2017, doi: 10.24246/j.scholaria.2017.v7.i3.p283-291.
- [5] J. Plummer, K. Cho, C. Palma, D. Barringer, T. Gleason, and K. Nolan, 'Assessing preservice elementary teachers' understanding of science practices using children's astronomy storybooks', *AEJ*, vol. 1, no. 1, Dec. 2021, doi: 10.32374/AEJ.2021.1.1.002.
- [6] Z. Luyan and L. K. Cheong, 'Blended Teaching For English Majors Based On SPOC Flipped-Classroom', vol. 6, no. 1, 2022.
- [7] J. Li, H. Luo, L. Zhao, M. Zhu, L. Ma, and X. Liao, 'Promoting STEAM Education in Primary School through Cooperative Teaching: A Design-Based Research Study', *Sustainability*, vol. 14, no. 16, p. 10333, Aug. 2022, doi: 10.3390/su141610333.

- [8] Salvador dos Santos, Augusto da Costa, Alexandre de Sousa Guterres, Agostinho dos, and Santos Gonçalves, 'Efficacy Of Stad And Tps Type Cooperative Learning Models In The Learning Process Of Social And Humanities Studies For Grade 3rd At Cristal' Senior High School', *Journal of Innovative Studies on Character and Education*, vol. 6, no. 1, pp. 112–126, 2022.
- [9] Ü. A. Berzener, 'The Effect of Cooperative Learning on EFL Learners' Success of Reading Comprehension: An Experimental Study Implementing Slavin's STAD Method', *The Turkish Online Journal of Educational Technology*, vol. 20, no. 4, 2021.
- [10] B. Petchngam, 'The Development Of Thai Language Skills By Using The Stad Technique For Grade 12 Of The Demonstration School Of Suan Sunandha Rajabhat University'.
- [11] D. A. Novianti, Mulyono, and B. Sinaga, 'Differences in Increasing Mathematical Critical Thinking Ability of Students Using the STAD and Jigsaw Cooperative Learning Model for Junior High School Students', presented at the 6th Annual International Seminar on Transformative Education and Educational Leadership (AISTEEL 2021), Medan, Indonesia, 2021. doi: 10.2991/assehr.k.211110.110.
- [12] F. Kristin, 'Efektivitas Model Pembelajaran Kooperatif Tipe STAD Ditinjau Dari Hasil Belajar Ips Siswa Kelas 4 SD', *Scholaria*, vol. 6, no. 2, p. 74, May 2016, doi: 10.24246/j.scholaria.2016.v6.i2.p74-79.
- [13] K. Yalçın and A. Hasan, 'The effect of cooperative learning on the academic achievement and attitude of students in Mathematics class', *Educ. Res. Rev.*, vol. 13, no. 21, pp. 712–722, Nov. 2018, doi: 10.5897/ERR2018.3636.
- [14] A. Septian, D. Agustina, and D. Maghfirah, 'Model Pembelajaran Kooperatif Tipe Student Teams Achievement Division (STAD) untuk Meningkatkan Pemahaman Konsep Matematika', *JM*, vol. 2, no. 2, p. 10, Jul. 2020, doi: 10.33365/jm.v2i2.652.
- [15] R. E. Slavin, 'Research on Cooperative Learning and Achievement: What We Know, What We Need to Know', *Contemporary Educational Psychology*, vol. 21, no. 1, pp. 43–69, Jan. 1996, doi: 10.1006/ceps.1996.0004.
- [16] G. Keske Aksoy and F. Gürsel, 'The Implementation of Personal and Social

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