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Improving mathematics learning outcomes of first-grade students with additional material using the STAD model at SDN Srengseng Sawah 04 South Jakarta

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mathematics learning outcomes;
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ABSTRACT This study used data from observations of first-grade primary school pupils at SDN Srengseng Sawah 04 South Jakarta in the 2017–2018 academic year who still had learning outcomes in the mathematics topic of addition material that fell short of the KKM norm. This study aimed to improve the learning outcomes of grade I children in math addition material. This study employs a cycle approach of classroom planning, implementation, observation, and reflection as its methodology. Thirteen class I B students, sixteen of whom were male and fifteen of whom were female, made up the subjects of this study. Their backgrounds varied concerning place of residence, social standing, and academic accomplishment. Pre-cycle findings showed 48.4% completeness, while cycle one completeness of student scores was 64.52%; cycle 2 data showed an average score of 96.77%. We can conclude that bettering student learning outcomes through a cooperative learning approach is possible.

INTRODUCTION

The early childhood curriculum includes math instruction (0-8 years). Young children gain the cognitive abilities to reason and think about quantities and numbers. The National Council of Teachers of Mathematics states that early childhood education should lay the groundwork for future mathematical understanding. Sefeldt, Carol (2006).

Because of these contrasts, particularly between the nature of mathematics and the nature of children, learning mathematics in elementary school is one of the studies that is always fascinating to discuss. Consequently, a bridge that can reconcile these disparities or contradictions is required. Children in elementary school are evolving in the way they think. Some elementary school students in small classes can think at the stage because their thinking is still not formal.

In order to meet learning objectives, a strategy must be developed to ensure that the goals are met as effectively as possible. It is doubtful that the objective will be accomplished without a plan that fits the appropriate model (Abdulah, 2008).

According to the problem analysis, students' math learning outcomes are still poor since there is no support for the teaching tools used for additional learning. Due to the teacher-centered learning process, which discourages student participation, students have not fully grasped the concept of additional material.

Researchers must improve learning so students can collaborate with friends and participate more actively in the learning process. Teachers should employ learning models in learning activities (KBM) that can stimulate students' curiosity and focus while requiring them to collaborate to learn.

Based on observations conducted during math lessons in class I at SDN Srengseng Sawah 04 Jagakarsa South Jakarta, it appears that children are not as engaged in new material and joke around a lot, making it difficult for them to respond when the teacher asks a question. Because of this, only 10 of the 31 children could reach KKM 70; the other 22 could not do so. Observing this pattern and remembering that math is more straightforward to teach, The teacher has an idea to enhance the learning outcomes of math addition material by using an appropriate method that is both play-based and relevant to daily life.

METHODS

This study employs class action research, which uses a cycle system of planning, carrying out, observing, and reflecting. Researchers employ the lecture method for learning activities, necessitating students to pay attention and hear teacher explanations. At SDN Srengseng Sawah 04 in South Jakarta in 2017–2018, the STAD Type Cooperative Learning Model was used to improve the mathematics learning outcomes of grade I students by providing them with additional material.

RESULT AND DISCUSSION

Improvement Learning Outcomes Description

The phases of the learning cycle carried out during teaching and learning activities in the classroom are where the research findings are explained. The learning implementation in this study was done in two cycles, called cycle I and cycle II. The research subjects were given a pre-test prior to the start of cycle I. Moreover, a post was provided after every cycle one implementation. The cycle I data is described as follows: 1) An explanation of the pre-cycle data, 2) An explanation of the cycle I data, and 3) An explanation of the cycle II data.

The researcher creates lesson plans and resources that complement learning activities aligned with the content taught before beginning pre-cycle activities.

1. Pre Cycle

In class I, during the pre-cycle learning implementation. With addition-related learning materials. In order to motivate students to learn, the researcher first gets them ready by reading prayers, ensuring they are present, and leading them in group singing. This activity is based on perception exercises. The teacher then communicates the learning objectives. After describing the addition material, the researcher explained the addition symbol. Researchers use media in the form of additional pictures drawn on the board to explain learning materials.

Some students pay attention while learning is implemented, and some engage in conversation. The teacher provides assessment questions after the lesson to gauge how well the material has been learned. According to the evaluation results, numerous students who receive scores do not meet the minimal requirements for completeness: 51.6% or 16 students.

It is evident from the learning implementation activities that the current learning process needs to be enhanced. It is envisaged that student learning outcomes will be able to meet the minimal completeness requirements through learning enhancements. Data on students' pre-cycle learning outcomes can be seen in Figure 1.

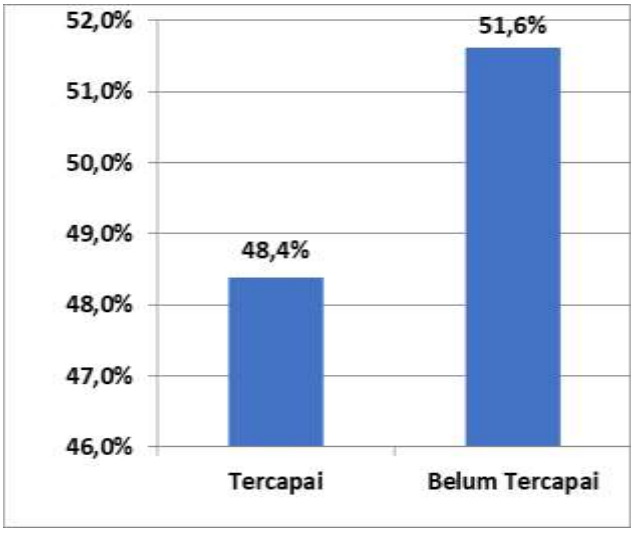

Figure 1. Pre-cycle Student Learning Completion Percentage Diagram

The learning outcomes of first-grade students at SDN Srengseng Sawah 04 obtained a value of 48.4% for learning completeness achieved and 51.6% for learning completeness that has not been achieved, as can be seen from the results of the pre-cycle student learning completeness percentage. Based on this data, the teacher needs to make learning improvements so that student learning outcomes can achieve learning completeness.

2. Cycle I

a. Planning stage

The learning outcomes for the first-grade students at SDN Srengseng Sawah 04 were 48.4% for those who met the learning objectives and 51.6% for those who did not meet the objectives, as can be seen from the graph that displays the learning outcomes for the first-grade students above. Based on the data mentioned earlier, teachers must make necessary corrections to the teaching process so that students' learning outcomes can reach learning objectives.

b. Implementation

Phase I: The instructor explains the lessons that need to be learned.

Phase II: The instructor reviews the material on adding numbers. Following several examples, the instructor asks the class if everyone has grasped the explanation or if some students struggle to understand. The instructor gives the class a chance to ask questions. According to the teacher, many students do not pay attention when the teacher explains things, so some students are still confused.

Stage III: The instructor then goes over how to form study groups. There will be the formation of learning groups, with five to six members in each group. There is a chairman for the learning group, and the other members are students with varying levels of learning ability—low, medium, and high—and female students. The teacher then gives each group a distinct assignment and distributes ice straws as learning materials to encourage participation and engagement from all students. The instructor assists pupils in determining the total outcome—enhancement of student learning results, cooperative learning model of STAD type.

Phase IV: The teacher monitors the students while the learning groups work on the assignment. Pay attention to silent and engaged students as the teacher moves from one group to another.

Phase V: The teacher asks students to present their group work in front of the class and any groups that did not pay attention after each group has completed. They followed the completion of each group's presentation of the findings in front of the class. The group with the highest score receives recognition and prizes from the teacher.

Phase VI To help students grasp the material better, the teacher and students summarize the lesson. The teacher provides an assessment after the class. The instructor ends the class by encouraging the pupils to continue their diligent study. The lesson needs to be practiced at home as well.

c. Observation Result

Following their observations during the learning activities, the researcher and supervisor 2 came to the following conclusions:

1) The teacher has done an excellent job managing the class as much as possible.
2) The teacher employed a cooperative learning strategy of the STAD kind in compliance with the lesson plan.

3) The amount of student activity during group learning has not been optimized; certain group members continue to abstain from participating.
4) Because students use ice straws to perform addition, their use of the ice straw learning medium has not been optimized.

Table 1. Observation Sheet of Teacher Performance

No	Aspect Observed	Emergence		Comment
		There is	There is not any	
I	Application of method variation	✓		
	Cooperative Learning			
	Fase 1:			
	1. The teacher conveys the objectives orally.	✓		
	2. The teacher conveys the learning objectives in writing.	✓		
	Fase 2:			
	1. The teacher presents information to students orally.	✓		
	2. The teacher presents information to students in writing.	✓		
	Fase 3:			
	1. The teachers explain to students the procedures for forming study groups.	✓		
	2. The teacher helps students create study groups.	✓		
	Fase 4:			
	1. The teacher helped the study group while doing the assignment.	✓		
	Fase 5:			
	1. The teacher tests student's knowledge of various learning materials, or each group presents the result of their group work.	✓		
	Fase 6:			
	1. The teacher finds a way to recognize student achievement efforts as a group.	✓		
	2. The teachers find a way to know student achievement efforts individually.	✓		
II	Use of pictures and natural objects as props			
	Use of pictures :			
	1. Show media image	✓		
	2. Ask for student comments.	✓		
	Use real things :			
	1. Using concrete media	✓		
	2. Share concrete media	✓		
	3. Guiding students using concrete media	✓		
III	Class situation			
	1. Students as enthusiastic	✓		
	2. Enthusiastic	✓		
	3. Time according to allocation	✓		

d. Reflection

In the following cycle, I implemented classroom action activities, and researchers and supervisors 2 carried out a critique. The researchers and the second supervisor discussed the advantages and disadvantages of the first cycle activities. Based on the student's learning outcomes, it appears that they are still not up to par and have not yet achieved the 80% level of complete learning. Thus, this study is carried out through the following cycle.

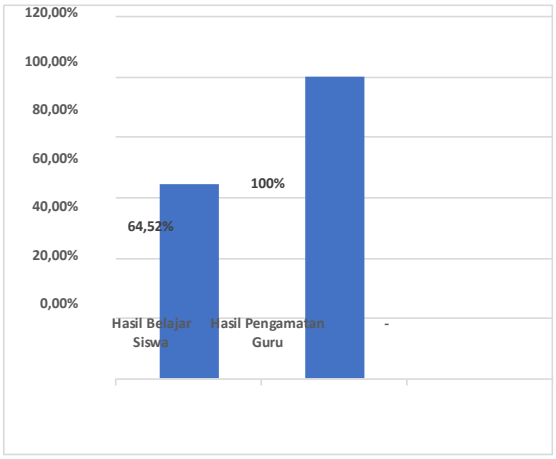

Figure 2. Diagram of Percentage of Student Learning Completion Cycle I

Figure 2 shows that 20 out of 31 students had achieved learning completeness when using the STAD-type cooperative learning model in math classes covering number addition material. The average student learning outcomes were 69.19, and the percentage of student learning completeness reached 64.52%.

The learning outcomes demonstrate that my learning cycle was not fully realized or finished. Students who scored>70 only attained a learning outcome of 64.52%. This indicates that an 80% level of completeness is the desired percentage.

3. Cycle II

a. Planning phase

During cycle II, the planning phase, the teacher assumes the role of a researcher, selecting the learning model that will be applied to preparing lesson plans and learning materials.

b. Implementation

In Phase I, the teacher presents the learning objectives and provides information on addition.

In Phase II, the teacher shows pictures that represent addition. All students appear enthusiastic while listening to the teacher's explanation during this meeting. In Cycle I, the teacher used learning media through pictures and straws. In Cycle II, the teacher used pictures, colored sticks, and glass aqua bottles as media.

In Phase III, the teacher explains the lesson using additional images that are counted together with the students. Then, the teacher writes the numbers on the board using addition techniques. This explanation helps the students to understand the addition lesson with the aid of visual aids.

Next, the teacher introduces the visual aids that will be used to teach addition, which are colored sticks and recycled bottles. The teacher explained the lesson using a demonstrative tool consisting of colored sticks in one bottle, combined with several other sticks from other bottles and counted. As usual, at the end of the lesson, the teacher allowed students to ask questions if they did not fully understand the material. During this session, the students quickly grasped the lesson.

In Phase IV, the teacher explains how to create study groups. Unlike in Cycle I, the classroom noise is not as disruptive, and students have become accustomed to group learning. Once the study groups are formed, each group is led by one student. The teacher then explains the activities that each group will undertake.

The teacher assigns different tasks to each group, and each group receives learning materials in the form of used bottles and sticks to work on the given tasks actively. Throughout the learning process, the class remains orderly, and all students work with their respective group members.

In phase V, the teacher monitors each group's activities and guides them in turn. During the group assignment, students were observed collaborating, and those who better understood the material assisted their peers in comprehension.

In Phase VI, after completing the group task, each group presented their work with a discussion on finding the product of numbers through repeated addition using manipulatives in front of the class. After all groups had finished presenting their work, the teacher awarded the group the highest grade.

In Phase VII, at the end of the lesson, the teacher and students summarize the lesson material to avoid misunderstandings. The teacher concludes the lesson by assigning homework.

c. Observation Results

During the learning activities, supervisor two and the researcher made observations. The following are the results:

1) The students have understood the material on the addition of numbers.
2) Implementing the cooperative learning model, specifically the Student Teams-Achievement Divisions (STAD) type, has been successful in the learning process.
3) The students' learning activity and the use of instructional media have been optimized.

Table 2. Observation Sheet for Teacher Performance

No	Aspect Observed	Emergence		Comment
		There is	There is not any	
I	Application of method variation	✓		
	Cooperative Learning			
	Fase 1:			
	3. The teacher conveys the objectives orally.	✓		
	4. The teacher conveys the learning objectives in writing.	✓		
	Fase 2:			
	3. The teacher presents information to students orally.	✓		
	4. The teacher presents information to students in writing.	✓		
	Fase 3:			
	3. The teachers explain to students the procedures for forming study groups.	✓		
	4. The teacher helps students create study groups.	✓		
	Fase 4:			
	2. The teacher helped the study group while doing the assignment.	✓		
	Fase 5:			
	2. The teacher tests student's knowledge of various learning materials, or each group presents the result of their group work	✓		
	Fase 6:			
	3. The teacher finds a way to recognize student achievement efforts as a group.	✓		
	4. The teachers find a way to know student achievement efforts individually.	✓		
II	Use of pictures and natural objects as props			
	Use of pictures :			
	3. Show media image	✓		
	4. Ask for student comments.	✓		
	Use real things :			
	4. Using concrete media	✓		
	5. Share concrete media	✓		
	6. Guiding students using concrete media	✓		
III	Class situation			
	4. Students as enthusiastic	✓		
	5. Enthusiastic	✓		
	6. Time according to allocation	✓		

d. Reflection

The researcher and supervisor discussed the benefits and drawbacks of the activities while they carried out the second cycle of classroom activity. The students were encouraged to actively learn the repeated addition technique for multiplication of numbers by employing the cooperative learning method, namely the STAD model, along with relevant media. The pupils received good grades because of their enhanced learning outcomes in the second cycle.

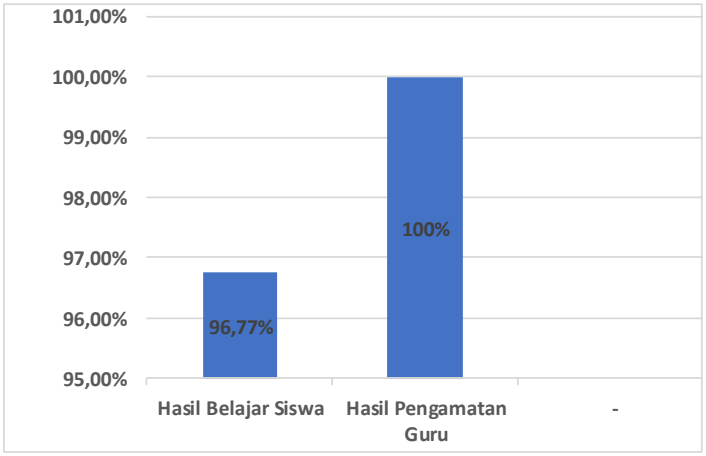

Figure 3. Diagram of Student Learning Achievement Percentage in Cycle II

Present Figure 3 shows that by implementing the cooperative learning model of STAD in math classes, student learning outcomes are estimated to be approximately 96,77 and present a 100% success rate for the teacher observation. This has reached learning fatigue.

According to the learning outcomes, it can be concluded that the second semester's instruction was successful because the student's learning nilai > 70 was 96.77%. This suggests that learning outcomes should be presented more frequently than 80% of the time.

Improving Learning: A Discussion of Research Findings

There is an increase in average and presence for students in SDN Srengseng Sawah 04 from the results of the Pre-Cyrcle, Cyrcle I, and Cyrcle II lessons.

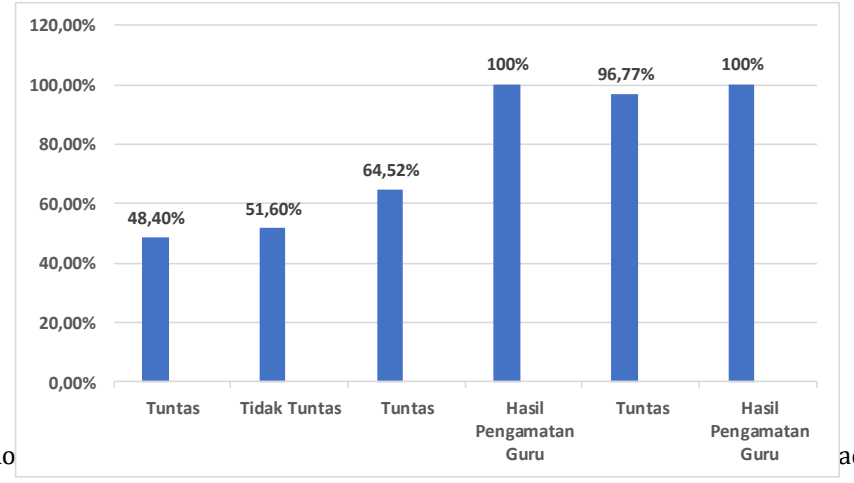

Figure 4. Diagram of Student Learning Achievement Percentage in Pre-Cycle, Cycle I, and Cycle II

Based on the above data, it can be observed that the learning outcomes for the first semester were 64.8, with a percentage of 48.4%, or 15 out of 31 students, having reached the milestone. Conversely, cycle I average 69.19%, with a percentage of 64,52%, or 20 out of 31 complete students. Furthermore, the II category averages 83.87% and 96.77%, meaning 30 out of 31 students have completed it.

The utilization of the cooperative learning model (STAD) in mathematics education has a significant impact on students' learning outcomes. This may be shown in the increasing student learning rates from 48.4%, pre-semester II, 64.52%, and 96.77%. In this way, the study is excluded from the second chapter since the presentase, which reached 96.77%, was less than the minimum of 80%. The results of this research are successful and have to be verified.

CONCLUSION

There was an increase in the siswa nilai rata-rata in the first stage, 48.4%, and in the second stage, 64.52%. Subsequently, in the second stage, the increase was 96.77%. Based on research and teaching outcomes, it can be concluded that STAD's cooperative learning model can improve students' math learning outcomes.

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