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Number lines in learning mathematic integer at the upper level

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ABSTRACT

Background: Students who have a good understanding of mathematics tend to have proud learning achievements. Good mathematics learning outcomes are influenced by intelligence and material mastery. However, teachers interact more with the white board than with students. students feel less enthusiastic because the teacher asks students to listen during the delivery of the lecture.
Purpose: This study aims to determine the appropriate method in conveying integer material to elementary school students.
Design and methods: This research uses classroom action research methods on 25 of fifth grade students of SD Negeri Cibunian in the second semester. This classroom action research adapted the cycle scheme proposed by Kemmis & Taggart. This scheme consists of a series of plots, including planning, acting, observing, reflecting, and revised plans for each cycle.
Results: The results of this study reveal the use of number lines in mathematics subject matter integers in class V can improve student learning outcomes. This is evidenced by the percentage of students who score above the pre-cycle passing score of 28% or 7 students complete learning, in the first cycle it increases to 56% or 14 students complete their learning, and in the second cycle it reaches 80% or 20 students complete learning.

Keywords: classroom action research, mathematics, number line media

Introduction

Understanding of the concept of mathematics for elementary school students is a basic asset (Cizek, 1996; Hidayati, 2017). Students who have a good understanding of mathematics tend to have proud learning achievements. These student learning achievements are the holistic achievements of the teaching and learning activities process.

Good mathematics learning outcomes are influenced by intelligence and mastery of the material (Siregar & Nara, 2014). The whole material has of course been planned by the teacher from the learning stage with levels of cognition, psychomotor and affection that are adjusted to age development (Bahar et al., 1999; Garn & Byra, 2002; Haryadi & Aripin, 2015; Tall, 1995). In addition, the availability of learning support facilities also helps students understand the material presented. Meanwhile, teachers who always develop themselves in implementing learning strategies will certainly also have a positive impact on student learning outcomes in class. Thus the learning evaluation process can run with results that are in line with lesson planning.

In simple terms, the results of learning mathematics are supported by several things, including 1) students; 2) availability of learning resources; 3) teacher learning strategies, and 4) learning evaluation (Dimyati & Mudjiono, 2009). These four things cannot be equated

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with each school. The reason is that students' backgrounds are very diverse, the availability of learning resources depends on school policies, teacher strategies are also influenced by self-motivation which is always good, as well as evaluations that pay attention to and consider the absorption of students.

Schools that are close to the city center will be faster in the process of repairing the 4 aspects mentioned above. However, for schools that are far from the crowds, maybe even in areas that are difficult to reach by public transportation, of course, it will adjust to the actual conditions.

SD Negeri Cibunian 01 is a school located on Mount Bunder Leuwiliang, Bogor and located far from the city center. The development of education in this school relies on a program of activities assigned by the local education office. Personal development of local teachers is less attractive.

The limitations of this school are certainly felt by students. For mathematics subjects on integer material, for example, students are presented with the lecture method. It must be admitted that the lecture method is not the best. This method is teacher oriented. Teachers interact more with the white board than with students. students feel less enthusiastic because the teacher asks students to listen during the delivery of the lecture. After the lecture, students were asked to work on a number of math cases to solve.

This study aims to determine the appropriate method in conveying integer material to elementary school students. A number of methods have been carried out by a number of researchers that have resulted in good improvements, including the KOTAK BARISAN which is applied to Junior High School students (Palupi et al., 2017), audio video-based interactive media (Dewi & Haryanto, 2019), and coloring LEGO as a trigger for operational visual stimuli (Rohmatin, 2019).

The research that was conducted seeks to find a method that is acceptable for the fifth grade students of SD Negeri Cibunian 01 with the limited learning resources available at the school. In other words, this research was conducted to encourage teachers to provide acceptable and tested presentations through assessment of learning outcomes

Methods

This research method uses classroom action research methods on 25 fifth grade students of SD Negeri Cibunian 01 in the second semester of the 2019-2020 school year. This research was conducted in two cycles with the subject of positive and negative integer operations. This research was conducted in collaboration with local teachers to apply the method of delivering material according to the direction of the researcher. To test the acceptance of delivery, a diagnostic test for the absorption of the material was carried out on the research subjects.

This classroom action research adapted the cycle scheme proposed by Kemmis & Taggart. This scheme consists of a series of plots, including planning, acting, observing, reflecting, and revised plans for each cycle. This research was conducted in the presence of pre-cycle, cycle I, and cycle II. In the pre-cycle, students are given tests to students to find out their level of understanding of integer operations. Furthermore, the results of student work are analyzed for making lesson plans. Cycle I is carried out by implementing the pre-cycle planning contained in the lesson plan. Cycle II is carried out by only changing the core activities of the lesson plans that are made.

With this division of cycles, the research data obtained were the results of observations, documents and diagnostic test results which were then randomly asked to students through interviews. The test is carried out with the following indicators: 1) reading and writing whole numbers in words and numbers, 2) performing the addition of positive and negative integers;

and, 3) perform the subtraction operation for positive and negative integers. All data were validated using data source triangulation techniques. The data source triangulation technique is a procedure to check the accuracy of one another's data.

The success of classroom action research is indicated by a positive impact on the actions given. The measuring tool for success in this study was carried out by calculating the percentage of the standard value of the minimum completeness criteria. If 75% of students or more of the population are considered the action given is successful.

Findings & Discussion

Pre cycle I

The school environment is quite supportive even though the school is located in a rural area. The school does not yet have sufficiently complete facilities to support teaching and learning activities. The school has 14 rooms, including: 9 classrooms, 1 teacher room, 1 principal's room, 4 bathrooms for teachers and students, and 1 library room. SDN Cibunian 01 personnel consist of 1 principal, 9 class teachers, 1 school guard. Of all the teachers, 3 were civil servants and & honorary teachers.

In conducting the research, it is also necessary to have an initial description of the learning outcomes obtained by grade V SDN Cibunian 01 in Mathematics in the form of a pre-test. Initial data obtained by researchers can focus on things that will be improved. It is known from 25 students that only 7 students or 28% have achieved a passing score of 60, while the remaining 18 students or 72% obtained a passing score of 60.

Cycle I

The stages of action planning carried out by class V teachers in cycle I are arranged based on students' initial test, then a lesson plan is drawn up using number line media.

As for what the researcher must prepare for the implementation of this learning. Among them are: Learning Implementation Plans, teaching materials, Student Worksheets, test sheets, and student and teacher observation sheets. Researchers also prepare props or media to be used for the learning, namely the number line.

The learning implementation carried out by the researcher is in accordance with the lesson plan by applying demonstration, question and answer, and discussion methods. Mathematics learning in cycle I was observed by researchers with the aim of obtaining positive findings on learning outcomes.

At the beginning of learning the researcher conditioned the class by motivating students to be ready to start learning. After students are ready to learn, researchers convey learning material by conducting questions and answers to students. Then the researchers prepared a number line. After that the researcher demonstrated how to use the number line and was followed by the students. In the final activity, students work on the evaluation contained in the worksheet independently.

Action observation is carried out by observing and assessing student activities in mathematics learning. This observation was carried out by the researcher by filling in the student activity observation sheet.

Based on the results of the researchers' observations in cycle I, it can be said that the researcher has carried out learning activities in accordance with the lesson plan but there are still deficiencies in the implementation of the learning, including: 1) The teacher is less motivating students are interested in the learning material, so that students do not respond to questions given by the teacher; 2) The teacher does not provide examples of complex questions about integer arithmetic operations, 3) The teacher does not provide clear conclusions on the learning delivered; 4) The time used by the teacher to explain the material

is too long; 5) Less effective learning time, because all students want to move forward to use number line media.

During the learning process there were several student activities that were assessed by the researcher. The activities of the students being assessed were attention, courage, and student activity. The following is an example of a data table from the observation results of the fifth grade students of SDN Cibunian 01.

To obtain the learning outcomes of class V students in Cycle I, a test is needed to measure the extent to which students understand the material taught by the teacher. The test used to determine the learning outcomes of fifth grade students at SDN Cibunian 01 is a form of 20 questionnaires.

Based on the test given to 25 students as respondents, it obtained data on the learning outcomes of class V SDN Cibunian 01 in Mathematics in the material of integer arithmetic operations.

From these data, the average value obtained by students is 58, if you look at the passing score of 60, the learning cannot be said to be successful. Students who have not completed reach 44%, while students who have completed only reach 56%.

The incompleteness of these students can be influenced by the learning method, namely demonstrating number line media but students are not yet used to using teaching aids, students do not all understand how to use props in solving addition and subtraction negative integer questions, and students are still confused in distinguishing shapes (facing right or left) and sometimes forget what is positive and what is negative.

In the first cycle, it is known that the average value of learning outcomes in mathematics subjects achieved by students is 59, the average value of learning outcomes in Mathematics which is achieved by students in cycle I, which is slightly longer than the specified passing score of 60. When compared with the average value The learning outcomes of mathematics subjects obtained by students on the initial test were 53, so the average value of learning outcomes in the first cycle had increased.

The achievement of the value of learning outcomes in Mathematics which was achieved by students in the first cycle was 56%. While the value of learning outcomes in Mathematics that have not been achieved by students in the first cycle is 44%. Classically, the students have not yet finished learning Mathematics which the students have achieved is smaller than the indicator of research success, namely 75%. Thus, to fix it, it is necessary to make improvements in cycle II.

Cycle II

The stages of action planning carried out by class V teachers in cycle II were compiled based on the results of reflection from cycle I. Therefore, a different learning implementation plan was drawn up from cycle I. As for what the researcher had to prepare for the implementation of the learning. Among them are: Lesson Plans, teaching materials, student worksheets, test sheets, and student and teacher observation sheets. Researchers also prepare teaching aids.

Researchers carry out the learning process according to the planning in the RPP. The implementation of this II cycle action is an improvement from cycle I. The implementation of the action in cycle II begins with the initial activity by inviting students to do ice breaking games to explore students' knowledge. The researcher conducted question and answer questions during the presentation of the material and involved more students in learning. The teacher guides students in the use of number line media and analyzes the questions on the LKS. The teacher also guides students in concluding learning material. In the final activity, students do the evaluation contained in the LKS independently.

Action observation is carried out by observing and assessing student activities in mathematics learning. This observation is carried out by the researcher by filling out the activity observation sheet.

To obtain the learning outcomes of class V students in Cycle II, a test is needed to measure the extent to which students understand the material taught by the teacher. The test used to determine the learning outcomes of fifth grade students at SDN Cibunian 01 is a form of 20 questionnaires.

Based on the test given to 25 students as respondents, it obtained data on the learning outcomes of class V SDN Cibunian 01 in Mathematics in the material of integer arithmetic operations.

From these data, the average value obtained by students is 70. If you look at the passing score of 60, learning can be said to be successful. as many as 20 students or 80% who have achieved a passing score of 60 or can be said to be complete. Meanwhile, 5 students or 20% obtained a score below the passing score or it can be said that they are not yet complete. The completeness of these students is because students feel they have been taught the material and students are getting used to the use of teaching aids in class learning activities.

In the second cycle of learning mathematics using number line media, it can be said to be successful. This can be seen from the average value of the second cycle obtained by 70. The average value exceeds the predetermined passing score, namely 60, and there is an increase when compared with the average value of the first cycle, which is 59. While the achievement of the value of learning outcomes in Mathematics which was achieved by students in cycle II was 80%. Meanwhile, the value of learning outcomes that have not been achieved by students in cycle II was 20%. Overall students have achieved completeness because the achievement of the value of student learning outcomes exceeds the research success indicator, namely 75%.

Based on the results in cycle II, it can be said that this classroom action research was successful. With the achievement of the minimum completeness value obtained by students. In addition, it can be seen from the learning outcomes of each student who on average can reach the predetermined passing score. Below is a summary of the results of the second cycle research which includes aspects of changes in student activity, and learning outcomes tests.

Based on the summary of the results of the second cycle assessment, it can be concluded that in cycle II the researcher has succeeded in improving student learning outcomes. This can be seen from the research objective is to improve student learning outcomes, besides that the increase in learning outcomes is also supported by increased student activity.

Interpretation

From the learning outcomes obtained by students in cycles I and II, it can be seen on figure 1 that the increase is quite significant. It is shown on the blue bar that students number who pass the passing score. The following is a table comparing the learning outcomes of class V SDN Cibunian 01 in pre-cycle, cycle I and cycle II.

The existence of student activities and student learning outcomes is a link. Because of the teacher's efforts to optimize the use of instructional media that has been planned, so as to make students more motivated and play an active role in learning, as well as focus and enthusiasm on the material provided by the teacher. So that it has a positive impact on student learning outcomes.

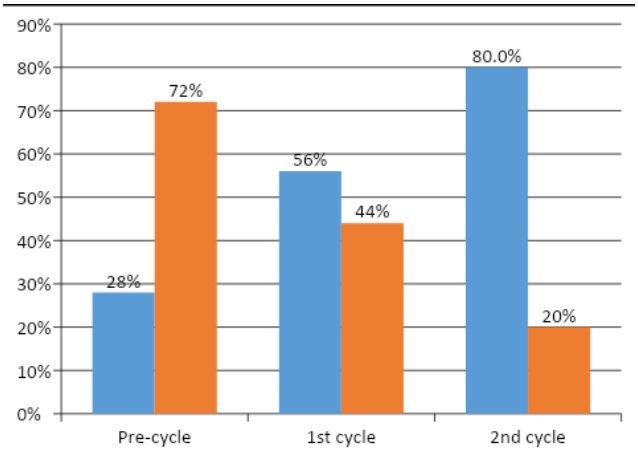

Figure 1 Achievement on students' activities and learning outcomes

Increased student learning outcomes in cycle II influenced by student activity in cycle II. Teaching and learning activities are conditions that are deliberately created. Therefore, the success of teaching and learning activities is greatly influenced by the teacher. The researcher created a different learning strategy from cycle I to cycle II according to the results of the reflection.

An increase in student activity has an impact on student learning outcomes. Evidenced by the results of observations made by researchers, there was an increase in the activities shown by students in cycle II by 77% or with good interpretation.

Increasing student activity in cycle II will also have an impact on increasing student learning outcomes. Evidenced by the tabulation of student learning outcomes in cycle II, the percentage of student learning outcomes achieving a passing score of 60 was 20 students or 80%. This shows that the research that the researchers conducted was successful, because the indicators of success had exceeded the determination that the researchers had set at 75%.

Conclusion

The use of number lines in mathematics subject matter integers in class V can increase student learning activities. This is in accordance with the observations that have been made on students starting from the pretest, cycle I and until cycle II there is an increase in the pre-research, namely 56% and in each cycle, the average cycle I is 70% with a fairly good interpretation, while in the second cycle the increase is 77% average with good interpretation.

The use of number lines in mathematics subject matter integers in class V can improve student learning outcomes. The percentage of students who scored above the pre-cycle passing score of 28% or 7 students completed learning, in cycle I increased to 56% or 14 students completed learning, and in cycle II reached 80% or 20 students completed learning. Thus, the use of number line media in mathematics subject matter integers can increase student activity and student learning outcomes of class V SDN Cibunian 01 Bogor.

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