

ENHANCING LEARNING OUTCOMES OF THIRD GRADE STUDENTS AT SDN CIPUTAT 06 ON INTEGER OPERATIONS THROUGH THE USE OF BUTTON MANIPULATIVES, DEMONSTRATION METHODS, AND PRACTICE EXERCISES

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Abstract: This study aims to improve the mathematics learning outcomes of third-grade students at SDN Ciputat 06, specifically in the topic of integer operations. The research employs button manipulatives, examples and practice exercises, and demonstration methods to facilitate learning. The initial assessment showed that only 30.8% of the students met the Minimum Competency Criteria (KKM) of 60. After implementing the interventions in two cycles, the percentage of students meeting the KKM increased to 84.6%. This significant improvement highlights the effectiveness of using concrete learning aids and interactive teaching methods in mathematics education.

Keywords: Button manipulatives; demonstration methods; practice exercises; mathematics education; integer operations.

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INTRODUCTION

Learning in the world of education is the process of interaction between students and educators and learning resources in a learning environment. Learning is an assistance provided by educators so that the process of acquiring knowledge and knowledge, mastering skills and habits, and forming attitudes and beliefs in students (Faizah, 2020). In other words, learning is a process to help students learn well (Fakhrurrazi, 2018)

Mathematics learning involves understanding abstract concepts and structures and identifying the relationship between them. Effective mathematics teaching must evolve from simple concepts to more complex ones and initially present ideas in concrete form (Majid & Amaliah, 2021). Learning mathematics is about abstract concepts and structures contained in mathematics and looking for relationships between concepts and mathematical structures. Learning mathematics must go through a process that lasts from simple concepts to more complex concepts. Every mathematical concept can be understood well if it is first presented in concrete form

(Wijayanti & Yanto, 2023). One of the objectives of mathematics subjects is to understand the concept of integers and their calculation operations, as well as their use in daily life (Y. Anggraini, 2021). Based on this description, it can be said that teachers' understanding of the nature of mathematics learning in elementary school can design a good implementation of the learning process that is in accordance with the cognitive development of students, the use of media, methods and approaches that are appropriate, so that teachers can create a conducive learning atmosphere and the implementation of effective learning activities.

In mathematics lessons, the term integer is often found. The definition of a number itself is a unit of quantity used to mention a certain number on an object (Unaenah et al., 2020). Numbers are denoted by numbers. We know the numbers 0 – 9 which have different values. While an integer is a number consisting of: 1) Positive integers (1, 2, 3, 4, 5, ...), 2) Zero (0), 3) Negative integers (..., -5, -4, -3, -2, -1). The speed of children's mastery of the concept of counting numbers can vary (Trisanti et al., 2021). This is due to various things, including environmental factors and children's habits as well as confidence factors (Mahmuda et al., 2021).

The concept of integers is much more complex for children, because here they will face numbers that are the opposite of the natural numbers they have learned so far, namely negative numbers (Dewi & Haryanto, 2018). Teachers should always remind children that negative numbers are the opposite of positive numbers if children seem hesitant in solving problems. The more they practice solving calculations, the more they will face various kinds of problems, so their skill level will increase. Many problems arise in the integer system for elementary school students, for example, when they will perform calculation operations such as: $4 + (-7)$; $(-6) + 9$; $(-3) - (-6)$; and so on (Trisanti et al., 2021). The problem that arises in relation to such questions is how to provide explanations and how to instill the meaning of the operation concretely, because we know that in general, students think from concrete things to abstract things (Jalinus & Alim, 2018).

The most basic naming of mathematical concepts in children is about calculation operations. To teach the concept of calculation operations to children, they must always pay attention to the stage of children's thinking development (Sagita & Kania, 2019). This is to avoid material insynchronization with the child's thinking stages. Considering that mathematical concepts are actually abstract, but children's thinking stages for elementary school age are usually still concrete, teachers must strive to concretize the abstract concepts so that children do not feel difficult (Putriana et al., 2021). Without using real objects, children at this stage will usually experience difficulties unless the concept has been mastered well by the child while still in early childhood education. In introducing the concept of calculation operations in the integer system, it can be carried out through 3 stages, namely: 1) The stage of introducing the concept concretely, the demonstration model that can be developed is using the set approach (using bead props), and the second model is using the law of length conservation approach (using number line block props or line bands or number line ladders), 2) Semi-concrete or semi-abstract concept introduction stage The calculation process is directed using a line of numbers., 3) In the abstract concept introduction stage, students are introduced to abstract concepts of calculation operations (Jagom et al., 2020).

The age period of elementary school is from 6 years to 11 years old. In this age range, elementary school students are included in the middle and late childhood phases. At this age, children master basic skills of reading, writing and counting (Wiresti & Na'imah, 2020). Formally they began to enter the wider world with their culture. Achievement is the direction of attention to the world of children, and self-control also increases (T. Anggraini et al., 2023). Human development is a synthesis of developmental tasks and social tasks. In elementary school age children, it is in *industry vs inferiority*/productivity. Children begin to be able to think deductively, play and learn according to existing rules (Khaulani et al., 2020). In terms of cognitive development, the age of elementary school students is at the concrete operational stage, where the ability to think logically begins to emerge at this stage. They can think systematically to achieve problem solving. At this stage, the problem she faces is a concrete problem (Henita et al., 2023).

The initial assessment in grade III of SDN Ciputat 06 revealed that students had difficulties in integer counting operations, with an average score of 40, far below the KKM of 60. This drives the need for teaching improvements using concrete learning aids and interactive methods to increase understanding and engagement. The use of button props, giving examples and exercises, as well as demonstration methods in improving mathematics learning of integer counting operations, were assessed according to the age development of grade III students of SDN Ciputat 06. By using clothes button props accompanied by demonstrations, it is hoped that students can learn with real objects. In addition, the provision of relevant examples is expected that students can imitate in completing integer counting operations. By providing exercises, students are expected to improve their learning outcomes.

Teaching aids are a tool that can be absorbed by the eyes and ears with the aim of helping teachers to make the teaching and learning process of students more effective and efficient (Annisah, 2014). The teaching and learning process is characterized by several elements, including objectives, materials, methods and tools, and evaluation. Elements of methods and tools are elements that cannot be separated from other elements that function as a way or technique to deliver as lesson material to reach the destination (Amir, 2014). In this achievement, the role of aids or props plays an important role because with these props the material can be easily understood by students.

Teaching aids are essentially used to help teachers make the teaching and learning process of students more effective and efficient (Sagita & Kania, 2019). In choosing the right teaching aids, there are five things that teachers must pay attention to, namely: objectives, subject matter, teaching and learning strategies, conditions and students who are learning and need to be vigilant, so as not to use teaching media that are not too small, so that children are difficult to see and become noisy (Annisah, 2014). The purpose of the props is to; 1) Introduce, form, enrich, and clarify, 2) Develop the desired attitude. 3) Encourage further student activities (Jagom et al., 2020).\

By seeing this urgency, the author chooses an alternative solution using teaching aids in learning integer operations mathematics in the form of red and blue buttons. The red button is a substitute for a negative integer, and the blue button is a symbol of a positive integer. With the use of these button props, students can experience learning using real objects so that their teaching results can be improved.

METHOD

This research is a Classroom Action Research which is carried out by following research procedures that include planning, action, observation, *reflection* or evaluation activities (Prihantoro & Hidayat, 2019). These four activities take place repeatedly in the form of cycles, namely cycle I and cycle II. The purpose of this study is to describe the effectiveness of button props, providing examples and exercises, as well as demonstration methods in improving mastery of the concept of integer counting operations and improving learning outcomes in this material for grade III students of SDN Ciputat 06. This research was conducted in grade III of SDN Ciputat 06, involving 26 students. The intervention is applied in two cycles, each consisting of the planning, action, observation, and reflection phases. The intervention strategies used are 1) Manipulative Shirt Buttons: Used to represent integers and facilitate direct learning of integer counting operations. 2) Demonstration Method: The teacher demonstrates the use of manipulative and integer counting operation steps. 3) Exercises: Students practice integer counting operations through guided and independent exercises.

RESULT AND DISCUSSION

The grade III score in the integer counting operation material in terms of addition and subtraction in the pre-cycle obtained the average class score of only 40 with a minimum completeness criterion (KKM) of 60. Students who obtained scores above KKM were 8 students or around 30.8%. The completeness of learning in the first pre-cycle is very low, there are still 3 students who get a score of 0 and the highest score is 80, and the mode in this pre-cycle is 40 out of 12 students. This is due to teachers who do not use teaching aids in explaining the material and lack of examples of questions and exercises. So that students do not master the concept of this material. At the age of primary school grade IV, students still need concrete learning tools, they can think systematically to achieve problem solving (Wiresti & Na'imah, 2020). At this stage, the problem she faces is a concrete problem so that the use of real object props is very necessary (Annisah, 2014).

In the first cycle, which was held on September 6, 2021, students were introduced to manipulative button clothes and took part in demonstration lessons. The results showed an increase with 65.4% of students achieving KKM. The material on learning improvement in cycle I is the operation of counting integers, namely the addition of two integers and the subtraction of two integers. At the planning stage; Learning the concept of integer counting operations regarding the addition of two integers and the subtraction of integers using button props, giving examples and exercises as well as demonstration methods in the hope of improving teacher performance and improving student learning outcomes. At the action stage; The researcher carried out the improvement of mathematics learning in accordance with the planned steps such as conveying the topic and learning objectives in the initial activity, motivating students through questions and answers, providing 4 sample questions, accompanied by demonstrations of button props and explanations, guiding students through questions and answers about things that are

still difficult to understand, teachers giving feedback, concluding the material that has been learned with students accompanied by reinforcement, gave 6 formative evaluation questions and gave homework (homework) regarding integer counting operations. At the observation stage; The researcher conducted a discussion with Supervisor 2 and the principal for an observation plan, then made observations on the application of the use of button props, giving examples and exercises, as well as demonstration methods, recording every activity and changes that occurred during the application of the use of button props, providing examples and exercises, as well as demonstration methods and conducting discussions with Supervisor 2 to discuss the weaknesses or shortcomings carried out by the teacher. In the Reflection stage; The researcher analyzed the findings when making observations, analyzed the weaknesses and successes of teachers when applying the use of button props, giving examples and exercises, and demonstration methods, reflecting on the application of the use of button props, providing examples and exercises, and demonstration methods, reflecting on students' creativity in learning mathematics.

In the first cycle of learning improvement, the average grade score of 62.2 was obtained with a Minimum Completeness Criterion (KKM) of 60. Apparently, from the formative results, 17 out of 26 students obtained a score above the KKM with a graduation percentage of around 65.4%. The average score increased because in the first cycle of learning improvement, teachers used button props, gave examples of problems and exercises, and demonstrated button props through the demonstration method. The lowest score obtained by students in this cycle is 50 and the highest is 80, and the mode is 67 for 12 people. Although students are still shy to ask about their difficulties in learning this material, they are active enough to try the teaching aids in doing practice questions. The use of teaching aids in the form of real objects is very helpful for teachers so that the teaching and learning process of students is more effective and efficient (Jagom et al., 2020). In this cycle, the observer judged that the examples given by the researcher were too many, thus reducing the time for core activities used to work on the practice questions.

Furthermore, the second cycle was held on September 9, 2021, focusing on strengthening concepts through the continuous use of manipulatives and additional exercises. Based on the reflection of Cycle I, the improvement of Cycle II lies in consolidating the mastery of the concept of integer counting operations by presenting problem solving in daily life. The percentage of students who achieved KKM increased to 84.6%, indicating the effectiveness of the intervention. In this learning improvement activity, the average class score obtained was 78.8 with a Minimum Completeness Criterion (KKM) of 60. From the results of the formative evaluation, 22 students out of 26 who had scores exceeding the KKM with a percentage of learning completeness of 84.6% were obtained. Of the 26 students, there were 8 students who obtained a score of 100, with a mode of 75 as many as 14 people.

This increase in learning outcomes shows that students have mastered the concept of integer counting operations. Apparently, the use of button props, giving examples and exercises as well as demonstration methods can help strengthen the mastery of the concept of integer counting operations in solving story problems (Unaenah et al., 2020). Practice usually takes place by repeating something so that the expected ability is formed. This is proven by the increase in student learning outcomes. The increase in learning outcomes from cycle 1 to cycle 2 also occurred because teachers have made

continuous improvements from cycle 1 to cycle 2 (Fakhrurrazi, 2018; Prihantoro & Hidayat, 2019).

Student learning outcomes are measured during corrective actions through formative test questions. From the results of this formative test, researchers can find out the extent of the effectiveness of corrective actions taken by researchers. In addition, researchers can also measure whether the goal of improving learning has been achieved. The following are tables and diagrams of students' learning results regarding integer counting operations measured through formative tests in pre-cycle learning, cycle I learning improvement and cycle II learning improvement. For more details, the comparison of students' formative test scores is presented in the following graph.

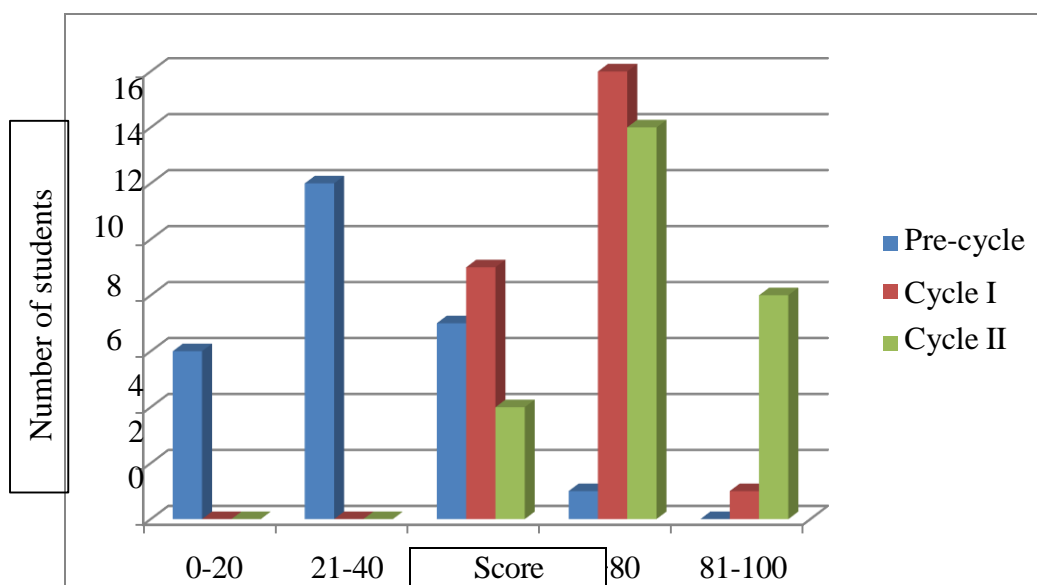


Figure 1. Comparison of Students' Formative Grades per Cycle

In addition to the form of graphs, the comparison of students' formative test scores is also presented in the form of a table as below.

Table 1. Comparison of Value Acquisition Between Cycles

Cycle	Minimum completeness criteria score	Maximum score	Minimum score	Modus	average	average increase
Cycle I	60	80	50	67	62.2	2.2
Cycle II	60	100	50	75	78.8	18.8

Based on figure 1 and table 1, it shows the comparison of scores between cycles, so that it can be seen that there is an increase in the acquisition of student learning outcomes through the highest score of 80 in the first cycle to 100 in the second cycle, as well as the original score mode of 67 in the first cycle to 75 in the second cycle. The average class score also increased from 62.2 in the first cycle to 78.8 in the second cycle.

CONCLUSION

The manipulative use of shirt buttons, combined with demonstration and practice methods, significantly improves students' understanding of integer counting operations. These findings show that integrating concrete learning aids and interactive teaching methods can effectively improve mathematics education in primary schools. The teacher's provision of examples accompanied by demonstrations using button props in solving problems creates an active, effective, and enjoyable learning atmosphere.

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