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Application of Concrete Learning Media to Improve Mathematics Learning Outcomes of Elementary School Students

Silvester[1], Pebria Dheni Purnasari[2], Margaretha Lidya Sumarni[3] dan Totok Victor Didik Saputro[4]

[1] Pendidikan Guru Sekolah Dasar, Institut Shanti Bhuana; e-mail: silvester@shantibhuana.ac.id
[2] Pendidikan Guru Sekolah Dasar, Institut Shanti Bhuana; e-mail: pebria.dheni@shantibhuana.ac.id
[3] Pendidikan Guru Sekolah Dasar, Institut Shanti Bhuana; e-mail: margaretha@shantibhuana.ac.id
[4] Pendidikan Guru Sekolah Dasar, Institut Shanti Bhuana; e-mail: totok.victor@shantibhuana.ac.id

Abstract: This study aims to improve student learning outcomes by applying concrete learning media to mathematics. This research is a type of Classroom Action Research (CAR). The subjects in this study were 27 students of SDN 03 Bengkayang class IV. Data collection techniques used are observation, questionnaires, tests, and documentation. Data analysis techniques using quantitative descriptive. The results of the study show that there is an increase in student learning outcomes by applying concrete learning media. This can be seen from the acquisition of an average pre-cycle value of 50.7 to 81.5 with an N-Gain of 0.6 in the moderate category. By implementing concrete learning media in mathematics, it becomes one of the strategies for solving problems in the teaching and learning proces.

Keywords: Concrete Learning Media; Learning outcomes; Elementary School Students.

1. Introduction

Education is one of the means that can create the nation's successors who are able to compete in today's digital era. In Law Number 20 of 2003 concerning the National Education System it is revealed that education is an effort that is really planned to produce an atmosphere and teaching and learning process so that students can improve discipline, intelligence, noble character and religious knowledge and abilities that are beneficial to themselves, society, nation, and conditions (Dakhi et al, 2020; Wulandari & Azka, 2018). Education is one of the real and systematic efforts in creating a teaching and learning process so that students can have the competencies needed to face the challenges of the 21st century (Dzulfikar, 2021; Zagoto, Yarni & Dakhi, 2019).

In its implementation, learning activities are very important to achieve educational goals (Putra & Yulanda, 2022; Zagoto, 2018). The achievement of educational goals requires a curriculum as a reference in carrying out the teaching and learning process. The curriculum currently being implemented in Indonesia is the Merdeka Curriculum. The Independent Curriculum as a learning recovery option proclaimed by the Ministry of Education, Culture, Research and Technology (Kemdikbudristek). This independent curriculum

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development policy option was given to educational units as an additional effort to carry out learning crisis recovery during 2022-2024 due to the COVID-19 pandemic. The independent curriculum as an alternative curriculum overcomes learning setbacks during the pandemic which gives freedom of "free learning" to learning implementers, namely teachers and principals in

Compiling, carrying out the learning process and developing curriculum in schools pays attention to the needs and potential of students (Rahmadayanti, D., & Hartoyo, A, 2020). Through independent learning and strengthening the Pancasila student profile and focusing on the essential material of the independent curriculum, it is hoped that it will be able to overcome current and future educational problems (Johar Alimuddin, 2023).

Mathematics is a subject that is always listed at every level of education such as SD/MI, MP/MTs, SMA/MA, and the equivalent. It "aims to prepare students to live everyday life and keep abreast of developments in the world. Learning mathematics can change thinking to be more mathematical, systematic, logical, firm, and precise. Mathematics plays a major role in enabling students to think and solve mathematical problems (Agustina, 2020). Mathematics can encourage students to think logically by using reasoning activities (Susanto, 2015). Mathematics is "a method used to find answers to problems of knowledge about shapes and sizes" (Wahyudi and Budiono, 2012:6). Mathematics includes numbers, symbols, rules, and related meanings (Soemoenar et al. 2007:1.6). The presentation of mathematics learning that is carried out is still monotonous with the lecture method so that it cannot increase students' concrete understanding of material concepts. Meanwhile, Piaget (Desmita, 2011) argues that elementary school-age children still think at the concrete operational stage.

Based on the results of observations made by the mathematics learning process, in class IV SDN 03 Bengkayang on the material for addition and multiplication of numbers the teacher only applies the lecture method without the help of learning media so that it has an impact on the learning outcomes obtained by students, learning tends to be more teacher centered. These problems are certainly influenced by various factors in the implementation of learning, one of which is the selection of learning strategies and the use of media in the teaching and learning process. This is important so that students more easily understand the subject matter conveyed by the teacher so that learning media are needed such as concrete teaching aids to assist the teaching and learning process. Characteristics of elementary school students tend to prefer learning through play and activities that involve imagination and creativity. They have a high need to play and develop social, cognitive, and physical skills through interaction with their surroundings. The use of concrete props can make learning more fun; students can learn while playing.

In previous research (Setiyowati, 2017) using concrete media in his research, he revealed that students get help in the process of visualizing abstract concepts in the learning material provided. Likewise (Vioreza & Marpaung 2021) reveals that students' lack of interest in learning is caused by students' lack of understanding of concepts or subject matter, thus affecting student learning outcomes. (Prabawanti, E.T., et al, 2021; Ermawati., et al, 2023) Suggested that to build the scientific attitude of students in elementary schools is to create concrete and contextual learning in the world of students' lives. Thus, students will have curiosity, honest, critical in thinking. Concrete media makes it easier for students to understand abstract things as a medium for conveying learning information (Mutoha, 2018). This research was conducted to determine the application of concrete learning media to improve students' mathematics learning outcomes.

2. Results

Based on the results of the pre-test and post-test conducted on all fourth-grade students at SDN 03 Bengkayang, namely the learning outcomes before applying concrete learning media in the learning process and learning outcomes after applying concrete learning media is described in the following table:

Tabel 1. Posttest and pretest Learning Outcomes

No	***Pretest***	***Postest***
1	60	80
2	50	80
3	60	90
4	40	70
5	50	80
6	40	80
7	50	80
8	40	70
9	70	90
10	60	80
11	70	90
12	40	70
13	20	70
14	60	80
15	70	90
16	40	80
17	70	90
18	30	80
19	60	80

20	40	70
21	50	80
22	40	80
23	50	80
24	70	100
25	50	80
26	70	90
27	20	80
Average Value	50,7	81,1

Based on the data above, the average value of students' learning outcomes in the pretest or learning outcomes before the application of concrete learning media is 50.7 and the learning outcomes of students after implementing concrete learning media is 80.1. There is an increase in student learning outcomes after the implementation of concrete learning media, this can be seen in diagram 1 below.

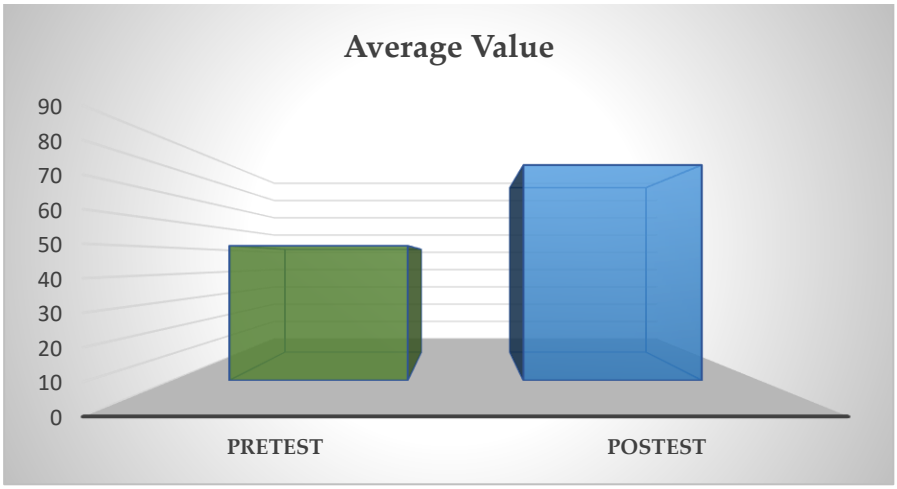

Diagram 1. Posttest and pretest Learning Outcomes

Diagram 1. Posttest and pretest Learning Outcomes Based on the diagram above, the learning outcomes of students have increased learning outcomes. At the pretest stage the average value of student learning outcomes was 50.7, then after applying concrete learning media the average value of learning outcomes obtained by class IV students in mathematics subject increased by 81.1 with an N-Gain value of 0.6 in the moderate category and an effective N-Gain interpretation value of 62.1 in the moderately effective category.

3. Discussion

Learning media refers to all forms of tools or materials used to assist the learning process and communicate information to students. Learning media aims to increase students' understanding, involvement, and learning achievement using relevant tools, technology, and resources. Learning media can take various forms, including visual media such as pictures, graphics, and videos; audio media such as sound recordings and podcasts; text media such as textbooks and reading materials; interactive media such as computer simulations and learning applications; and concrete media such as physical manipulatives and learning games. Learning media can also involve digital technology, such as

learning software, e-learning platforms, and online resources. The use of instructional media can provide benefits such as increasing student engagement, facilitating conceptual understanding, increasing information retention, and promoting active learning. Learning media can also help students visualize and experience real concepts, as well as relate new knowledge to experiences they already have. However, it is important to choose learning media that are appropriate to the learning context, learning objectives, student characteristics, and subject matter. Good planning, use of relevant media, and integration of learning media with effective teaching methods are important factors in maximizing the potential of learning media in improving student learning outcomes.

One of them is concrete learning media, concrete learning media will make it easier for students to classify objects based on shape, color, and size. They are required to build their own knowledge through a direct process which certainly involves children in every activity. This is in line with the characteristics of early childhood, namely strong curiosity, and high enthusiasm (Yusuf and Nani, 2011:48-50). The use of concrete media in learning is very important as a teaching and supporting teacher tool so that the learning content presented is clearer and more easily understood by students, because the concrete media will be used by students, namely by playing directly or together inside and outside the classroom. during study. This not only gives a different sensation for students but is also able to create a fun learning atmosphere and of course increase students' interest. In this way, students will indirectly participate actively voluntarily because of development according to expectations and maximum age standards (Rahmawati & Nina Permata Sari, 2022).

The use of media in the teaching and learning process is a component that cannot be separated. The use of appropriate media can help increase interest and learning outcomes so that in the learning process students become more active in finding information or subject matter independently through experience.

directly with the help of learning media (Rahayu & Hidayati, 2018). So, it is necessary to apply learning media in every teaching and learning process to improve student learning outcomes. Learning outcomes are the result of the learning process, which includes understanding, knowledge, skills, and attitudes acquired by students. Learning outcomes can be measured and evaluated through various indicators, such as tests, assignments, projects, observations, and other assessments.

Student learning outcomes, namely at the pretest stage with an average value of student learning outcomes obtained by 50.7, then after applying concrete learning media the average value of learning outcomes obtained by class IV students in mathematics subject has increased by 81.1 with an N-Gain value of 0.6 in the moderate category and an effective N-Gain interpretation value of 62.1 in the moderately effective category. By implementing concrete learning media in teaching and learning activities for fourth grade students at SD 03 Bengkayang, it is one way to improve student learning outcomes and one of the efforts to improve the quality of education. The learning process becomes more effective and enjoyable because the teaching and learning process is carried out in accordance with the characteristics of students in elementary schools. Information regarding related learning materials can also be well understood.

4. Materials and Methods

This research is a Classroom Action Research (CAR). Classroom action research (CAR) is a type of research method carried out by teachers to improve and enhance the teaching and learning process in the classroom. This is in line with what was stated by Afandi (Machali, 2022) that classroom action research is a scientific study and methods carried out by teachers to improve learning processes and outcomes. Teachers as educators must also be able to understand the concept of curriculum as a curriculum of subjects and learning experiences so that they can design educational learning and assess learning outcomes according to the characteristics of students. Data collection techniques used are observation, questionnaires, tests, and documentation. The data analysis technique in this

study was carried out quantitatively which was obtained from the mathematics learning outcomes of fourth grade students and then analyzed usinggain score to see how much improvement or change has occurred in student learning outcomes after the intervention, with the following formula:

$$(g) = \frac{\%\,(gain)}{\%\,(gain)max!} = \frac{\%\,(posttes) - \%(pretes)}{100 - \%(pretest)}$$

Keterangan:
N-gain : value gain
Posttest scores : learning outcomes before action
Pretest scores : learning outcomes after the action
Maximum score : maximum value of learning outcomes

The gain score range is as follows:
> 0,7 : High
0,3 – 0,7 : Medium
< 0,3 : Low

5. Conclusions

Based on the results of the study, it can be concluded that the application of concrete learning media can improve the learning outcomes of students in class IV SDN 03 Bengkayang. This can be seen from the acquisition of an average pre-cycle value of 50.7 to 81.5 with an N-Gain of 0.6 in the moderate category. By implementing concrete learning media in mathematics, it becomes one of the strategies for solving problems in the teaching and learning process. By implementing concrete learning media, the learning process becomes more enjoyable and makes the process of conveying information more effective.

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