Improving the Ability to Understand Building Spaces through the Use of Visual Media for Grade V Students of SDN Kolor II

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Abstract

This study was motivated by the low academic performance of students in mathematics, particularly in the topic of solid geometry, which requires strong visualization and spatial reasoning skills. The purpose of this research is to investigate the extent to which the use of visual media can enhance the mathematics learning outcomes of fifth-grade students at SDN Langsar I. The research employed a Classroom Action Research (CAR) approach conducted over two cycles, with each cycle consisting of planning, action implementation, observation, and reflection stages. The results of the study indicated a significant improvement in students' learning outcomes following the implementation of visual media in the learning process. In the pre-action phase, only 3 students met the Minimum Mastery Criteria (MMC). After the implementation of Cycle I, the number of students who achieved mastery increased to 7 students, representing 43.75% of the class. A more substantial improvement was observed in Cycle II, where 14 students, or 87.5%, successfully met the MMC. These findings demonstrate that the integration of visual media such as images, 3D models, and other visual aids has a positive impact on students' conceptual understanding and academic achievement in learning solid geometry. Therefore, visual media can be considered an effective alternative teaching strategy to improve the quality of mathematics instruction at the elementary school level.

Keywords: *Visual Media, Learning Outcomes, Mathematics, Solid Geometry, Elementary Students, Effective Learning.*

INTRODUCTION

Education has a very important role in human life because it is the basis for the development of all aspects of personality and life (Siregar & Nara, 2017). Education is a basic need of every individual, where every human being has the same right to obtain a proper education. This is in line with Law Number 20 of 2003 concerning the National Education System which states that education is a conscious and planned effort to create a learning atmosphere and learning process so that students can actively develop their potential. This potential includes religious spiritual strength, self-control, personality, intelligence, noble morals, and skills needed for themselves, society, nation, and state (Arsyad, 2019).

In this context, education is interpreted as a process of mentoring and facilitating students so that they can develop optimally. One of the formal paths to get an education is through school. Elementary school (SD) is a very fundamental level of education in forming the basis of students' academic abilities and character (Munadi, 2018). According to Waini Rasidi (1993, in Hera, 2009:1.7), elementary schools are units or units of social institutions that are given special tasks by the community to organize basic education systematically.

In elementary school, students study various subjects such as Civics Education (PKN), Religious Education, Natural Sciences (IPA), and Mathematics. Among these subjects, Mathematics is often a challenge for students because it requires logical skills, understanding of abstract concepts, and perseverance in practice (Fitria & Rahmawati, 2018). Based on the reality at SDN Kolor II, the results of Mathematics learning, especially in the volume unit material, are still below expectations. Many students have difficulty understanding the concept of volume units, and teachers face challenges in conveying them effectively (Nurhadi & Saputra, 2022). This has an impact on the low achievement of students towards the minimum graduation standard.

Data in grade V of SDN Kolor II shows that out of 11 students, consisting of 5 male students and 6 female students, only 3 students or 27% were able to achieve the Minimum Completeness Criteria (KKM). Meanwhile, as many as 8 students or 73% have not reached the KKM. This condition indicates the need for strategic efforts to improve the quality of learning, especially through the selection and application of media that are in accordance with the characteristics of the material and the needs of students (Kurniawati & Rahayu, 2020; Susanti & Mulyani, 2022).

One of the solutions that can be taken is the use of visual media in the learning process. Visual media is a medium that involves the senses of sight, such as pictures, graphs, diagrams, or three-dimensional models, which can help students understand abstract concepts in Mathematics (Putri & Hidayat, 2019). According to Yudhi Munadi (2018), visual media is able to clarify the message conveyed so as to facilitate the process of student understanding. The same thing was conveyed by Sudjana (in Wibowo & Pratiwi, 2024) who stated that learning is said to be effective if the message conveyed by the teacher can be well understood by students as recipients of information.

This research was carried out as a form of concrete effort to improve understanding of the concept of building space through a more innovative and contextual learning approach (Fadilah & Wulandari, 2021). By integrating visual media into the learning process, teachers not only play the role of delivering material, but also as facilitators who create a more meaningful learning experience for students (Sari & Lestari, 2023). Visualization of abstract concepts such as building spaces becomes easier to understand when students can see, observe, and even manipulate geometric shapes directly or through attractive visual representations (Yuliana & Mahfud, 2021).

The use of visual media is expected not only to increase the achievement of student learning outcomes quantitatively, but also to foster interest and motivation to learn Mathematics which has often been considered a difficult and boring subject (Widodo & Wahyudin, 2018; Prasetyo & Widodo, 2020). Therefore, through this study, the researcher wants to prove that visual media can be an effective alternative in improving the quality of Mathematics learning in elementary schools, especially in building materials that require good spatial thinking skills (Hartati & Fitriani, 2016; Anwar & Latifah, 2015).

By using visual media, it is hoped that Mathematics learning, especially in space building materials, will be more interesting, easy to understand, and able to improve student learning outcomes. Based on this background, the researcher is interested in conducting a study entitled "Improving the Ability to Understand Building Spaces through the Use of Visual Media for Grade V Students of SDN Kolor II."

METHOD

1. Subject & Place of Research

The subject of this study is a grade V student of SDN Kolor II, Sumenep City District, Sumenep Regency, East Java. The total number of students in class V is 16 students consisting of 6 male students and 10 female students. The reason for the researcher to choose the subject of this research is based on the consideration that grade V students still lack mastery of Mathematics lessons, especially space building materials.

2. Research Procedure

Classroom Action Research (PTK) is a form of learning activity that is deliberately carried out to improve / improve student learning outcomes. This research was carried out in two cycles. Each cycle consists of stages; (1) planning, (2) implementation of actions, (3) observation and evaluation, (4) analysis and reflection. In simple terms, the PTK cycle flow scheme is shown as follows:
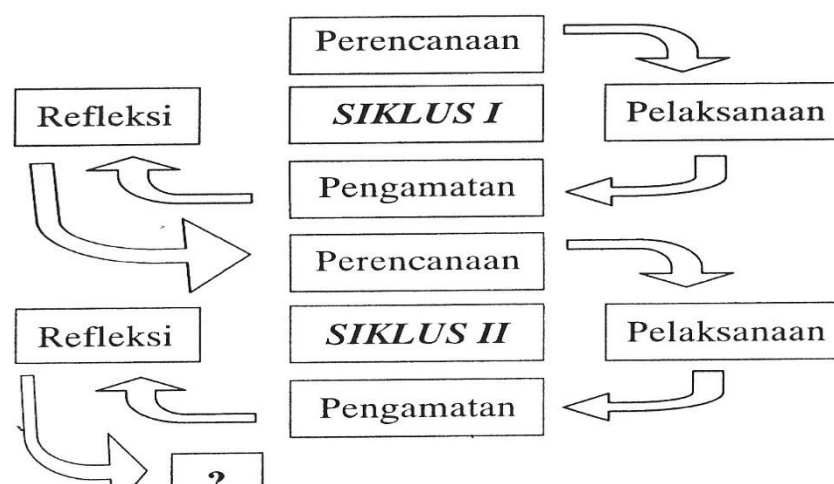
Figure 3.1 Stages of Classroom Action Research According to Suharsimi (2014:16)

According to Suharsimi (2014:16), the stages of implementing actions carried out in class action research consist of:

1. Planning
2. Implementation (*acting*)
3. Observing
4. Refleksi (*reflecting*)

1. **Data Collection Techniques**

    The data collection in this study was obtained based on the results of the test instrument which was used as a tool by the researcher to measure students' abilities in the cognitive domain, while the test instrument used by the researcher was to use an objective test in the form of multiple-choice questions through the student's daily test worksheet. Meanwhile, in order to measure students' abilities in the affective and psychomotor domains of students, the researcher uses non-test activities, namely through observation sheets and observations by researchers regarding the development of student performance and learning activities during the Mathematics learning process.

2. **Data Analysis Techniques**

    The method used by the researcher in analyzing the learning results of students' daily exams in the form of multiple-choice questions is to use the following formula:

    $$\sum fx = \frac{M}{N}$$

    Information:

    Mean = average

    $\sum$ fx = total student score/score

    N = number of students

    Furthermore, to assess student learning outcomes, the assessment analysis used by the researcher is:

Table 1 Assessment Analysis

Numerical Value	Letter Values	Predicate
80 – 100	A	Very good
66 – 79	B	Good
56 – 65	C	Enough

46 – 55	D	Less
0 – 45	And	Fail

Calculation of learning completeness

$$K = \frac{\sum ni}{N}$$

Information:

K : completeness of classical learning outcomes

Σni : number of students who have completed their studies

N : number of students

3. Success Indicators

The Success Indicators in this study are known based on the results of data analysis, the average value of the learning outcomes that have been analyzed compared to the learning outcomes of students with the previous ones.

When learning is carried out with visual media, it is targeted that the 16 students of class V will be able to achieve daily test scores with a score of 75.00 as the average score of their class.

From the comparisons of learning outcomes through the test, it will be known how much completeness has been achieved and how much of the percentage of improvement in student learning outcomes in Mathematics subjects if the learning outcomes obtained previously are compared to using visual media. Success Criteria This research is said to be successful if all students who can master the material are up to 80% to 90%. Classroom action research (PTK) activities are said to be successful if 85% of students can improve their ability to understand the building of classroom space for grade V students of SDN Kolor II, Sumenep City district.

RESULTS AND DISCUSSION

1. Research Results Data

The data obtained from the results of the research in the form of numbers were analyzed to prove the hypothesis that had been proposed.

a. Pre-Action Test Result Data

Before this class action research is carried out, the author first conducts pre-action activities, namely conducting an evaluation in the form of test repeats so that the student learning test score before the action on the completed space building material is 4 students and the number of students who do not complete is 12 students out of the number of class V students totaling 16 students. And the average score is 65.31, while the minimum completeness criteria (KKM) is 75. This shows that the competence to build classrooms V of SDN Kolor II is still substandard.

b. Cycle I Learning Test Results Data

Cycle I learning is carried out with a fixed time of lesson hours (2 x 35 minutes) each cycle.

From the results of the first cycle test, the score of the student learning test in the first cycle of learning activities in the subject of Mathematics of space building materials that were completed was 7 students and 9 students who did not complete out of the number of students in grade V of SDN Kolor II which amounted to 16 students. And the average score is 71.25. while the minimum completeness criteria (KKM) is 75. This shows that there is an increase in learning competence in space building materials with the use of visual media.

c. Cycle 2 Learning Test Results Data

Cycle II learning is carried out with an improvement time of lesson hours (2 x 35 minutes) each cycle.

From the results of the second cycle test, the value of the student learning test in the 2nd cycle learning activity has increased significantly in the subject of Mathematics of building space materials. The number of students who completed in cycle 2 was 14 students and 2 students from the number of students in the VSDN Kolor II class which amounted to 16 students. And the average score is 80.31 while the minimum completeness criteria (KKM) is 75. From the learning activities of cycle 2 above, the learning competency in the building material for class V students of SDN Kolor II is said to be successful.

2. **Data Analysis**

a. Analysis of Student Learning Outcome Test Scores

The learning outcome test was carried out at the end of cycle 1 and cycle 2. The results of this test are used to determine the level of students' understanding of the material that has been delivered by the teacher. The acquisition of student tests in each cycle can show an increase or decrease in the learning outcomes of each student. If described in the table, the acquisition of student learning outcomes starting from pre-action to cycles 1 and 2 will appear as follows:

Table 2 Recapitulation of the Acquisition of Learning Outcome Test Scores for Grade V Students of SDN Kolor II

Value Criteria	Initial Value	Cycle I value	Cycle value 2
Total Values	1045	1140	1285
Highest Score	80	85	90
Lowest Score	50	60	70
Completeness (%)	25% (4 students)	43.75% (7 students)	87.5% (14 students)
Incomplete (%)	75% (12 students)	56.25% (9 students)	12.5% (2 students)

Based on table 4.1 above, the highest score of student learning outcomes before action is only 80 while the lowest score is 50, with a completeness rate of only 25% or 4 students who complete while 12 students or 75% who are not complete in the mathematics subject of building space materials. This score is far from the standard maximum completeness criteria (KKM) determined by the school of 75.

In cycle 1, there was an increase with the highest score obtained by students was 85 while the lowest score was 60, with a completeness rate of 43.75% or 7 students who completed, while those who did not complete 56.25% or 9 students.

In the 2nd cycle of learning activities, the test result scores increased significantly with the highest score reaching 90 and the lowest score being 70, with a completeness rate of 87.5% or 14 students who completed, while those who did not complete 12.5% or 2 students. In the table, the scores achieved by students in each cycle vary in each individual. This depends on the level of knowledge and activeness of students during the learning process. The acquisition of the learning outcome test scores can be used to calculate the average grade point and the completeness of student learning outcomes.

b. Results of Class Average Grade Calculation

The calculation of the average class of each cycle aims to find out the average learning outcomes of students in class VSDN Kolor II Sumenep City in the subject of mathematics of building space materials through the use of visual media.

The following is a comparison table between learning outcomes before being subjected to action and after being subjected to action.

Table 3 Average Score of Class V in Mathematics Subject Building Materials

No	Cycle stages	Class average score
1	Before the action	65,31
2	Cycle I	71,25
3	Siklus 2	80,31

Before the research was carried out, the average score of students' mathematics tests was relatively low, which was 65.31. The average score is far below the standard of the predetermined grade average of 75. This is tried to be improved by implementing effective learning media using visual media. In cycle 1, the average grade of the class managed to increase to 71.25. Although it has increased, it has not met the standard of grade average grades determined so it is necessary to continue improvements in cycle 2. In cycle 2, the average grade of the class increased to 80.31 which means that it has succeeded in meeting the standard of the grade average grade. With these results, there is no need to hold follow-up actions in cycle 3 because the average grade indicator has been achieved. Based on the data from the results of classroom action research (PTK) that has been carried out, it has succeeded in improving learning outcomes for grade V students in the mathematics subject of building space materials at SDN Kolor II, Sumenep City, Sumenep.

c. Results of Classically Completeness Calculation

The calculation of the completeness of classical learning outcomes is used to determine the percentage of students who have met the completeness of learning for one class. With the calculation of the level of completeness of student learning

outcomes in a classical manner, this is part of the success indicators of classroom action research (PTK) carried out by the success of the research The level of completeness is also used to see the success of the learning carried out. The completeness of each cycle can be seen as follows:

Table 4 Classical Completeness of Class V SDN Kolor II in Mathematics Subject Building Materials

No	Cycle stages	Total completeness			
		Tuntas	Percentage (%)	Not yet	Percentage (%)
1	Before the action	4	25%	12	75%
2	Cycle I	7	43,75%	9	56,25%
3	Cycle II	14	87,50%	2	12,50%

From the table above, the percentage of completeness can be calculated using the following descriptive formula:

1. Before the action

   Complete (%) = $\frac{n}{N}$ x 100% = $\frac{4}{16}$ x 100% = 25%

   Incomplete (%) = $\frac{n}{N}$ x 100% = $\frac{12}{16}$ x 100% = 75%

2. Cycle I

   Complete (%) = $\frac{n}{N}$ x 100% = $\frac{7}{16}$ x 100% = 43.75%

   Incomplete (%) = $\frac{n}{N}$ x 100% = $\frac{9}{16}$ x 100% = 56.25%

3. Cycle 2

   Complete (%) = $\frac{n}{N}$ x 100% = $\frac{14}{16}$ x 100% = 87.5%

   Incomplete (%) = $\frac{n}{N}$ x 100% = $\frac{2}{16}$ x 100% = 12.5%

The results of the calculation above can be illustrated through the chart as follows:

Figure 1: Comparison Graph and Improvement of Classical Completeness in Mathematics Subject Building Materials for Classroom V SDN Kolor II
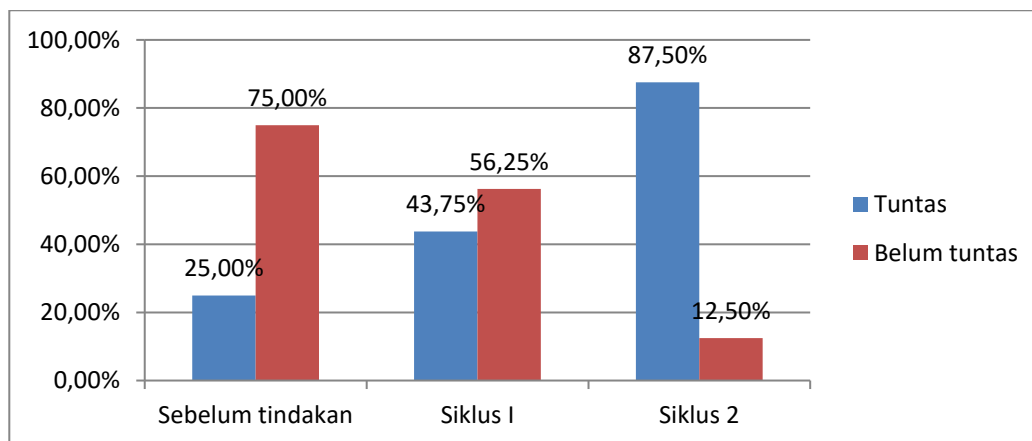
Based on the chart above, the completeness of student learning in classical terms before the action was only 25% or 4 students who completed their studies and 75% or 12 students did not complete their studies. In cycle 1, there was an increase of 43.75% or 7 students who completed their studies and another 56.25% or 9 students who had not completed their studies. Furthermore, the action was continued in cycle 2 and as a result, student completeness increased by 87.5% or 14 students and students who had not completed by 12.5% or 2 students. The classical learning completion percentage from cycle 1 was 43.75% and in cycle 2 increased to 87.5%, showing that classroom action research has been successful.

CONCLUSION

Based on the results of the research in the presentation of the results of the research above, it can be concluded as follows:

1. The use of visual media in an effort to improve the ability to understand building space in grade V students of SDN Kolor II, sub-district of Sumenep City can be done by using visual media that are real or concrete so that students can easily absorb or understand the subject matter about building space.

2. From the results of the study, it is clear that there is an increase in the understanding of building space in grade V students through the use of visual media at SDN Kolor II, Sumenep City sub-district, Sumenep regency. The completeness of student learning is classically before the action of only 25% or 4 students who have completed their studies and 75% or 12 students have not completed their studies. In cycle 1, there was an increase of 43.75% or 7 students who completed their studies and another 56.25% or 9 students who had not completed their studies. Furthermore, the action was continued in cycle 2 and as a result, student completeness increased by 87.5% or 14 students and students who had not completed by 12.5% or 2 students. The percentage of classical learning completeness from cycle 1 was 43.75% and in cycle 2 increased to 87.5%, showing that classroom action research has been successful.

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