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Optimizing Image Media on Mathematics Learning Outcomes for High Grade Students in Elementary Schools

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ABSTRACT

Learning media has an influence on learning success. Suitable learning media must be adapted to the abilities and development of the students the teacher will teach, so teachers must adapt the learning media to the students' needs. The research objectives are: 1) to describe the planning for the application of image media to fifth grade students at SD Negeri 02 Gempolan in mathematics subjects; 2) describe the implementation of learning for class V students at SD Negeri 02 Gempolan using image media; 3) Describe the supporting and inhibiting factors for implementing image media in mathematics learning for fifth grade students at SD Negeri 02 Gempolan; 4) Describe a solution to overcome the factors inhibiting the application of image media to class V students at SD Negeri 02 Gempolan. SD Negeri 02 Gempolan, Kerjo conducted this research. The principal, teachers and fifth grade students were the subjects of this research. Interviews, observation and documentation are the methods used in data collection. This research uses a qualitative approach with phenomenological methods. Data validity is carried out using source triangulation techniques and technical triangulation techniques. The research results show that the use of image media is able to foster student enthusiasm in learning, so that image media that is managed optimally can improve mathematics learning outcomes.

Introduction

Learning processes, plans and patterns must be consistent; Both teachers and students must play an active role in the overall teaching and learning process, both mentally, emotionally and physically (Wulandari et al., 2022). As a teacher, you need to do your learning as well as possible by arranging the sequence of learning activities so that they are fun and varied (Apriliana et al., 2019). Along with changes in the educational paradigm, improving the quality of learning is encouraged to follow an era that will continue to develop (Sari & Sari, 2021; Gumartifa et al., 2023). Teachers must be competent because optimizing the implementation of their duties and professionalism in the field of teaching are needed to produce professional teachers. According to Sudirman (2017), teachers have the role of providing information, organizing, encouraging, directing, providing initiative, providing facilities, mediators, and evaluators.

According to Sutryani et al (2023), the reality in the field of mathematics is that it is a scary subject. In fact, students often experience failure in doing social work, calculating, and memorizing formulas in learning mathematics (Nufus & Duskri, 2018). This is caused by boredom in learning, teacher delivery that is difficult to understand, and inappropriate placement of media use (Nur et al., 2020). As a result, students feel bored, unfocused and sleepy, which can affect students' learning abilities, especially in calculating quickly, using logic, writing skills, drawing and processing numbers. In line with the opinion of Kusnandi and Sutjipto (2011), students will experience many negative impacts, especially on learning motivation, failure to understand learning, laziness in participating in mathematics learning, and difficulty following future learning developments (Putri, 2023).

Several studies related to the use of image media have been conducted. First, research conducted by Pramesti (2019), discusses that graphic media can increase learning motivation with the results of learning motivation indicators. Second, research conducted by Ghenasty (2018), explains that the use of image media in class II thematic learning at SDN 01 Curug, Depok City shows an increase in student learning motivation. Third, research conducted by Safitri and Kabiba (2020), explains that the process of using image media by teachers in the learning process shows an increase in students' interest in learning, making students more active, involved in questions and answers, mastering learning, and the class becomes more communicative. Fourth, research conducted by Muhammad Ichsan Arifka Rahan (2023) discussed the learning process using a series of image media which resulted in changes in students' average scores in mathematics lessons. Fifth, research conducted by Wahyu Iskandar (2013) discussed the effectiveness of learning for class II students at SDN 024 Tarai Bangun, Tampang District, Kampar Regency who used image media in mathematics learning. Sixth, research conducted by Faqih & Pratama (2020), discusses the influence of image media in learning on student activity and creativity. Seventh, research conducted by Yanti (2023), discusses improving student learning outcomes from the use of mathematical image media in class IV A students at SDN 21 Pulau Punjung, Pulau Pujung District. Eighth, according to Nurzayyana dkk (2021), explained that interactive learning media based on articulatory storylines was effective in developing speaking skills in class III students. Student responses became better after being given treatment. Tenth, research conducted by Yolanda min. (2022), explained that interactive learning media based on articulatory storylines was effective in developing speaking skills in class III students. Student responses became better after being given treatment. Tenth, research conducted by Handayani (2022) discusses the strong influence of image media on student learning outcomes, with student learning outcomes being better if they use image media. Eleventh, research conducted by Hayati & Emelda (2016) discusses that the use of appropriate image media will have an impact on increasing the willingness to learn so that it can improve student learning outcomes. Twelfth, research conducted by Sunarsih (2021) discusses that image media can improve student learning outcomes, the average learning outcomes which initially reached 70% increased to 90%.

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Based on observations made by researchers at SDN 02 Gempolan on 5–10 August 2023, it shows that the learning process carried out by class V teachers at SD Negeri 02 Gempolan has not been implemented optimally; The learning used still uses conventional methods that focus on communication (Minsih, 2018). One way teachers dominate the learning process is by using less than optimal media and time, as a result students feel bored and less enthusiastic about the learning provided (Rakhmah et al., 2024).

Based on these problems, researchers are interested in conducting research with the title "Application of Images in Class V Mathematics Learning at SD Negeri 02 Gempolan". It is hoped that this research article will succeed in achieving more optimal mathematics learning at SD Negeri 02 Gempolan and produce students who are creative, active and achieve the expected goals (Abidin, 2020; Rusnilawati & Gustiana, 2017).

Method

This research uses a qualitative approach with phenomenological methods. Phenomenology is a type of qualitative methodology that discusses the application of the researcher's perspective and mindset in the exploratory research process. Researchers carried out interpersonal subjectivity through exploration to find out what happened in mathematics learning using image media at SD Negeri 02 Gempolan Kerjo.

The data in this research uses primary and secondary data. Primary data was obtained through interviews with people (informants) and the results of observations in and outside of learning mathematics subjects. Meanwhile, secondary data is in the form of documentation and journal documents.

The collection techniques used in this research are interviews, observation and documentation. Interviews are conducted to exchange information through questions and answers. This is done by discussing the topic and asking questions about it so that data can be found. Observations were made when researchers observed informants who were carrying out teaching and learning activities (KBM) at SD Negeri 02 Gempolan Kerjo. Researchers have documented the application of image media through mathematics learning in schools, providing valid and proven data.

The validity of the data in this research uses source triangulation techniques by repeatedly checking data that has been obtained through several sources, namely the principal, teachers and students at SD Negeri 02 Gempolan Kerjo. Meanwhile, for technical triangulation, interview techniques and observation techniques produce the same data.

The data analysis technique in this research uses the interactive analysis model proposed by Miles & Huberman (1994), which can be carried out in four stages, namely: 1) Data collection, with data obtained from interviews, observations and documentation recorded in field notes, which consists of two parts, namely description and reflection, 2) Data Reduction, used to select relevant and meaningful data; 3) Data Presentation, used to combine information to explain a situation; and 4) Conclusion Drawing, namely drawing temporary conclusions. Once the data is complete, final conclusions can be drawn.

Results and Discussion

The results of observations, documentation and interviews with informants are presented and then analyzed so that they can describe the application of image media in mathematics learning at SD Negeri 02 Gempolan, in line with the opinion of Alfansyur & Mariyani (2020), the results of observations from various sources will be analyzed so that a conclusion can be drawn. The data aims to answer questions that lead to problem formulation, such as: 1) Image media planning 2) Application of image media 3) Supporting and inhibiting factors 4) Solutions. The results of interviews with informants regarding the application of image media are presented in table 1, 2, 3, and 4.

Table 1. Mathematics Image Media Planning for Class V SD Negeri 02 Gempolan

No	Informant	Answer
1	Principal	Before implementing learning, the teacher designs learning tools. For example, annual programs, semester programs, lesson plans, and other learning equipment.
2	Fifth grade teacher	We must first determine what the RPP is like, because many of the steps depend on the learning model chosen by the teacher, for example PBL, PJBL, Discovery Learning, or others, which will later be adjusted to the contents of the RPP. So, the first thing that must be done is to choose a learning model first, then create a lesson plan according to steps such as introduction, content and conclusion. For media, of course you have to follow the RPP, try to include the methods in the RPP, and continue to create learning media. The learning media is quite simple, using materials that are around so that students are not confused when using the media. Components in the RPP must have an identity, such as the identity of the school, class, time and teacher. The introduction has several stages depending on the teacher's planning so that it is more flexible, using several stages according to the teacher's design in the core part containing the use of media, learning steps according to the method, and closing. The closing section contains information about remembering the material that has been studied, working on evaluation questions, informing about further learning, and reading prayers. In essence there are three components, but the specifics depend on the teacher who designs it.

Table 2. Application of Image Media in Class V SDN 02 Gempolan

No	Informant	Answer
1	Principal	I completely hand over the implementation of the learning to the teacher because the teacher is the one who knows exactly how the learning process will be carried out. I can only provide the facilities that teachers need.
2	Fifth grade teacher	a. Making media by looking at the material from the RPP so that its implementation is in accordance with the material, objectives of competency standards, basic competencies and indicators of competency achievement from the RPP. b. Learning activities at SDN 02 Gempolan are carried out by delivering material and inserting media and material so that students are involved in using the media. Evaluation activities are carried out by asking questions about the material contained in the image media.
3	Fifth grade students 1	In learning mathematics, I learn to use the medium of drawing mathematical

No	Informant	Answer
		shapes. I am happy and enthusiastic when using image media. I am enthusiastic, and the teacher always uses drawing media with beautiful colors. I can write there because it is different from normal learning.
4	Fifth grade student 2	I like it when teachers teach mathematics using pictures because it is easier for me to understand. You will be very happy if you learn to use image media. Before studying, we are usually asked to study the material discussed the day before.
5	Fifth grade student 3	Mathematics learning taught by teachers using image media is carried out in class; I didn't feel bored or interested. Sometimes the teacher asks me to come forward to see image media. At the end of the lesson, the teacher asked me a question. This student's answer is in accordance with Rahimah's (2017) opinion that students who were initially shy become active and enthusiastic in the learning process.
6	Fifth grade student 4	After studying with the teacher's media, every time the teacher asked us to study the next material at home, I was told to come to the front to work because I sat at the back, I was motivated and curious about the media and its colors. Good.
7	Fifth grade students 5	Teachers teach this media including learning; In the core activities the teacher delivers material and inserts media. I had fun, and I understood more at the end of the lesson. The teacher asks questions as in the picture.
8	Fifth grade students 6	Teachers teach using image media. I am happy, and I am enthusiastic about learning mathematics. And in the end, it also left me with questions. I was interested because it was different from previous learning.

Table 3. Supporting and Inhibiting Factors for Implementing Image Media in Class V Mathematics Learning at SD Negeri 02 Gempolan

No	Informant	Answer
1	Principal	Supporting and inhibiting factors for students: students like new and interesting things, so it is not difficult to direct students to participate in learning. However, there are also students who are hyperactive, which creates obstacles in learning. The principal appreciates the efforts of teachers who want to make learning more fun, so that creative and innovative thinking needs to be used by teachers, while obstacles for teachers include limited creativity in making it, especially for older teachers.
2	Fifth grade teacher	The supporting factor for implementing media in elementary schools is the large number of students who are easily invited together to understand the material through image media. Apart from that, media also makes teaching easier; Students become enthusiastic, motivated and happy in class. The inhibiting factor is the student's sitting position, namely some students are not focused because the picture is pasted some distance away, causing students who sit in a backward position to not be able to see clearly. Apart from that, there are also students who are not actively involved because they are less interested in studying, and there are also those who are lazy.

Table 4. Solutions to Overcome Inhibitory Factors in Image Media in Class V Mathematics Learning at SD Negeri 02 Gempolan

No	Informant	Answer
1	Principal	As a school principal, I provide as wide an opportunity as possible for teachers to manage the class well based on the teacher's creativity. Because, the success or failure of a teaching and learning process depends on good communication between teachers and students.
2	Fifth grade student	Solutions to existing problems: a. By showing image media by walking towards the students, especially those sitting at the back. b. Good communication involves students being asked to come forward to look at image media and ask questions.

a. Mathematical Image Media Planning

The principal and fifth grade mathematics teacher at SD Negeri 02 Gempolan said that learning was designed by the teacher. In designing learning models, teachers use problem-based learning (PBL). To make the media, it is based on the RPP, and in making it using simple materials so that students can more easily understand the material through the media the. Making a RPP must include components school identity, class, time, and teacher. The introduction to the RPP includes several stages, but in its implementation it follows the teacher's wishes for more freedom; the core section contains information about media use along with problems related to the material provided; and the closing section contains apperception, working on evaluation questions, informing about further learning, and reading prayers. In essence, these three components must be present, but the specifics depend on the teacher when designing them. As stated by Segara & Akrim (2022), teachers must have the competence to prepare lesson plans in accordance with government regulations.

One of the functions of the RPP is as a guideline in planning image media, as Mahmudah (2015) argued, the RPP can be used as a reference or benchmark for teachers in carrying out learning activities, so that they can run effectively and purposefully, based on interview findings and documentation. The existence of indicators of competency achievement, basic competencies, suitability of subject matter, learning resources, assessment, time allocation, and even learning media are proof. In accordance with Lestari's (2013) opinion, it consists of time allocation, KI, KD, indicators, learning objectives, main material, methods, media, learning resources and assessment.

In accordance with the opinion of Sudjana and Rivai (2013), there are five principles of image media planning that teachers need to pay attention to, namely: 1) suitability to learning objectives; 2) encouragement of the content of learning materials; 3) ease of access; 4) teacher skills in using media; and 5) availability of time to use it. Meanwhile, according to research bySafitri & Kabiba, (2020), media planning must 1) adapt the material to the image, 2) design the image media, and 3). Forming steps in image media, and 4) Creating steps based on the RPP. The curriculum must have six aspects of development

components, which include: (1) learning must have indicators and objectives; (2) learning must formulate material; (3) learning must have media and sources; and (4) learning accompanied by approaches, models and methods. (5) learning activities, and (6) assessment. In line withAmelia & Elniati, (2021), the learning planning stages are: 1) according to the expected mathematics needs; 2) student analysis; 3) device design is determined by student characteristics; 3) curriculum analysis must address basic competencies and competency standards; 4) concept analysis; and 5) mathematics material applied in grade V elementary school must achieve competency achievement.

b. Application of Image Media

The teacher carries out learning activities guided by the RPP. One of the lesson plans contains learning strategies, including using image media. Learning using this image media, beforehand the teacher conveys the material that will be taught next week with the aim that students have preparation. This is also in accordance with the opinion of the school principal that the implementation of learning is completely left to the teacher because it is the teacher who knows exactly how the learning process will be carried out. The principal can only provide the facilities needed by the teacher.

Based on observations made by researchers, it is true that during learning the teacher applies image media with strategies, methods, steps and evaluation questions that are in accordance with the RPP and even delivers them with preparation in the form of reminding students to learn. the material first. Learning starts at 07.00, and learning is carried out using image media. Based on the researchers' findings from teacher observations in the classroom, results were found if teachers carried out learning activities by involving students in mathematical drawing media. This student involvement creates a sense of enthusiasm.

Beautiful colors can attract students' attention and make them curious, so that students will be motivated to pay more attention to the material being taught. Students' understanding is strengthened by reflecting in the form of asking students again about the material and evaluating learning activities using image media through questions according to the material included in the image media. In line with research conducted by Wardani et al. (2017), there are at least several steps that teachers can take in applying image media, namely: interaction, discussion through image media, explaining material, writing, drawing, describing image media, and evaluation. In line with the opinion of Safitri & Kabiba, (2020), learning in the application of image media must be carried out by: 1) students are required to solve problems given by the teacher; 2) the teacher shows a picture, then students describe the material; 3) the teacher gives directions so that students describe the media correctly.

The application of image media to class V students at SD Negeri 02 Gempolan has been carried out correctly by the teacher. This is demonstrated by the appropriate actions taken by mathematics teachers by strengthening student interaction in class, clarifying material through image media, and providing re-

flection and evaluation questions to students at the end. learning.

c. Supporting and inhibiting factors in the application of image media

The application of image media certainly creates supporting and inhibiting factors in the learning process. Based on the principal's opinion, supporting factors can be obtained from teachers and students, such as students liking new and interesting things, so it is easy to direct students in learning. Meanwhile, based on the teacher's experience, during teaching, the supporting factor for students is that they are easily involved and enjoy learning activities using image media. Students also become enthusiastic and motivated to learn. Factors inhibiting students include sitting position and students who are hyperactive, causing them to be busy and not paying attention. The inhibiting factor for teachers is limited creativity in making them, especially for older teachers.

Based on observations made by researchers, it is true that image media has supporting factors such as students being enthusiastic in understanding the material in the mathematics learning process, but behind these supporting factors there are definitely inhibiting factors such as students who are lacking. Unlike their image media, learning tends to be busy and self-playing. Apart from that, making image media requires time, creativity and money. This is in accordance with opinion Mirnawati (2020), that image media has advantages including: easy to use, relatively cheap, and overcomes space and time limitations. In line with Safitri & Kabiba, (2020), elementary school students will find it easier to develop abilities and infer existing objects through learning image media. Meanwhile, according to opinion Meilani et a (2022), photos and drawings only suppress the sensory perception of the eye, so their size is limited for large groups such as learning. In the opinion of Karim et al., (2016), there are four factors inhibiting image media in learning, namely: 1) lack of interest in students' speaking skills in learning; 2) difficulty arousing students' interest in learning; 3) lack of activity in learning results in students having difficulty giving opinions; and 4) teachers' difficulties in determining appropriate methods in learning to develop students' ability to think.

d. Solutions to Overcome Inhibiting Factors

As a school principal, I provide as wide an opportunity as possible for teachers to manage the class well based on the teacher's creativity. Because, the success of teaching and learning activities lies in good communication between teachers and students. The solution that teachers can use to overcome the inhibiting factors is that the teacher shows the image media by walking closer to the students, especially those sitting at the back of the class, and good communication in the form of students being asked to come forward to see the image media. if you feel the image is not clear.

Based on the researcher's observations, observations were made, this is in accordance with what was stated by Siregar & Hasibuan (2017) that observations are situations of teaching and learning activities carried out during learning using image media. Observation results show that teachers are not imple-

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menting solutions optimally. This can be seen from the fact that there are still many students who do not focus on using image media in learning, thus disturbing students who want to pay attention and causing a lot of commotion in the class.As Sugiarni argues, (2020)The role of teachers can change in a more positive direction. Teachers should optimize learning by determining rewards for students. Such as providing motivation in the form of giving exemplary stars and giving punishment to busy students in the form of singing songs related to mathematics so that learning is more enjoyable and study time can be maximized. In accordance with Rahmawati's (2014) opinion, there are 7 solutions to optimize the application of image media in mathematics learning, namely: 1) stimulate students' interest in the lesson; 2) provide clear information so that students can easily understand the lesson; 3) increase reference materials in the learning process; 4) arouse students' learning motivation; 5) increase the efficiency and effectiveness of learning delivery; 6) presenting material with various variations clarifying the presentation of the message, this is in accordance with the opinion (Sari, 2022); and 7) increase real understanding of mathematical knowledge. In line with Hayati & Emelda, (2016), teachers can use five optimal mathematics learning solutions, namely: 1) Teachers start the material from what children know, not vice versa; 2) The teacher creates a pleasant teaching atmosphere; 3) The teacher provides many opportunities for students to speak. , work, debate, draw, and write about learning mathematics; 4) Teachers use children's language; and 5) Learning can be collaborated with other subjects.

Sianggaran et al (2022) argue that in education, learning activities are carried out in order to achieve a change in education in the form of attitudes and learning outcomes, so the solution for teachers is, among other things, to create image media that can be used repeatedly. Creativity can be generated by viewing innovations on YouTube or other social media. Budgeting with BOS funds is one way to overcome cost problems.

Conclusion

Image media is one of the tools or means used to convey material in learning, one of which is mathematics learning. The image media applied in this research can increase the value of learning outcomes or in other words, make it easier for students to understand the learning delivered by educators. The application of image media can achieve learning goals which will ultimately improve student learning outcomes, knowledge, interest, motivation and students' understanding of mathematics material. In the end, mathematics is no longer considered a difficult and boring subject.

At SD Negeri 02 Gempolan, the application of image media had not previously been implemented optimally. After carrying out this research, plans for future learning can be implemented optimally. The creation of more innovative and captivating image media shows this. The implementation is carried out at SDN 02 Gempolan by including image media into the core activities, dividing time using image media, involving students, reviewing the material that has been presented, and strengthening it by providing evaluation questions. The learning process in class V of SD Negeri 02 Gempolan which uses image media certainly has supporting and inhibiting factors in its implementation.

Supporting factors such as students being easily invited into the material through image media and students being easily attracted to image media. Meanwhile, inhibiting factors include image size, time constraints, and classroom conditioning by the teacher. Efforts made include displaying image media alternately, teacher time management, making rules, and creating interest in learning in the form of developing innovative image media to create more optimal mathematics learning.

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