

THE USE OF IMAGE MEDIA IN SCIENCE LEARNING GRADE FIVE ELEMENTARY SCHOOL

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Abstract

Students' understanding of concepts in Natural Sciences (IPA) learning in Grade V (FIVE) of State Elementary School 12 Mataram. The background of this study is the low student learning outcomes in the water cycle material, which can be seen from the lack of students' understanding of the processes and stages in the cycle. For this reason, the researcher uses a quantitative approach with a simple experimental design, namely one group pretest-posttest design, which allows comparative analysis before and after. This study aims to determine the effect of the use of image media on the treatment given. The subjects of this study were 30 students of class V who were selected as the research sample. The instruments used include a science concept understanding test to measure the improvement of learning outcomes and student activity observation sheets to assess student involvement during the learning process. The results of the pretest showed that the average score of the students was 58.2, while the posttest score increased significantly to 82.7 after learning using image media was applied. Data analysis using the t-test showed that the increase was statistically significant with a $p < 0.05$. In addition, observation of student activities during learning also showed an increase in participation and active involvement in discussions and other classroom activities. Based on these findings, it can be concluded that the use of image media has proven to be effective in improving understanding of science concepts, especially water cycle materials, as well as encouraging student activity in learning in elementary schools.

Keywords: Image media, Science learning, Concept comprehension, Elementary school

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INTRODUCTION

Natural Science (Ilmu Pengetahuan Alam-IPA) learning at the elementary school level plays a very important role in shaping the basis of students' scientific understanding of natural phenomena around them. At the basic education level, science not only functions as a means

to instill conceptual knowledge about nature and the processes that occur in it, but also as a forum to develop critical thinking skills, analysis, and problem-solving skills from an early age (Nuryani & Rahmawati, 2022). This is in line with the goals of national education which emphasizes the importance of developing students' competencies to be able to adapt and compete in the modern era which is full of scientific and technological challenges. However, the reality is that science learning in elementary schools still faces various challenges, especially in terms of understanding concepts that are abstract and cannot be observed directly by students. One of the materials that is often an obstacle for students is the water cycle. This material involves complex scientific processes such as evaporation, condensation, precipitation (rain), and infiltration (infiltration of water into the soil). These processes are very important concepts to understand because they are closely related to the natural cycle and the survival of humans and ecosystems (Sari & Lestari, 2021). However, these concepts are difficult for elementary school students to fully understand, especially since they do not yet have enough hands-on experience to observe the process in real life in everyday life.

The concept of the water cycle is one of the fundamental topics in science learning that is very relevant to students' daily lives. Every day, students experience rainwater, dew, and weather changes related to the water cycle. However, the presentation of this abstract and procedural material is often an obstacle to learning. Students tend to have difficulty imagining how water evaporates from the earth's surface, turns into clouds through the condensation process, then falls back as rain, and subsequently seeps into the soil or flows back into rivers and lakes (Prasetyo et al., 2023). This inability leads to a lack of deep understanding and awareness of the importance of preserving water resources as part of environmental conservation efforts. A good understanding of the water cycle is essential not only in an academic context, but also to foster environmental awareness and caring behavior towards natural resources. Students who understand the water cycle process well will have an easier time understanding the impacts of water pollution, deforestation, and climate change. Thus, effective teaching about the water cycle can be the starting capital to form a generation responsible for environmental conservation.

One of the effective solutions to overcome the difficulty of understanding abstract concepts is through the use of learning media that supports visualization, especially image media. Picture media can present concrete visual representations that help students connect abstract concepts with real experiences. This media is able to improve students' imagination and meaning process of Sari & Lestari (2021) learning materials. In addition, image media also plays an important role in increasing students' motivation and interest in learning, because attractive and relevant images can make the learning atmosphere more lively and interactive (Prasetyo et al., 2023). The use of image media in science learning has been supported by various previous studies. For example, Yuliana and Hartati (2021) show that image media significantly improves the learning outcomes of elementary school students, especially in understanding science concepts. Visual media facilitates the delivery of complex material, reduces the cognitive burden of students, and strengthens memory through dual coding, which is the simultaneous processing of information visually and verbally (Paivio, 1986). Therefore, the use of image media is not only as a complement, but as the main strategy in science learning so that the material can be absorbed more effectively by students. Referring to the relevance and potential of the image media, this study is focused on testing the effectiveness of the use

of image media in improving the understanding of the concept of the water cycle in Grade V (FIVE) students of SD Negeri 12 Mataram. In addition to measuring the improvement of learning outcomes through concept comprehension tests, this study also aims to evaluate the impact of image media on student activity during the learning process. Student activeness is an important indicator in the learning process because it shows the cognitive and emotional involvement of students with the learning material

This research is expected to provide a strong empirical contribution as a basis for teachers and curriculum developers in designing more effective and enjoyable science learning, especially by utilizing visual media. The results of this research are also expected to be a reference for schools and other educational institutions in optimizing the use of image media as a learning tool that can improve the quality of science learning and foster science literacy from an early age.

METHODS

This study uses a quantitative approach with a one-group pretest-posttest pseudo-experiment design to measure the influence of image media on the understanding of science concepts of Grade V (FIVE) students of SD Negeri 12 Mataram. The subjects of the study were 30 students, consisting of 15 males and 15 females, who had received water cycle material. The instruments used were in the form of a multiple-choice test of 10 questions with a reliability of Cronbach's Alpha of 0.812, as well as an observation sheet of student activities during learning. The research procedure began with a pretest to determine students' initial understanding, followed by learning using water cycle drawing media in two meetings, then ended with a posttest to measure the improvement of learning outcomes. Student activities were also observed to assess engagement during learning. The data of the pretest and posttest results were analyzed using a paired sample t-test with SPSS 25, with a significance level of $p < 0.05$ (Sugiyono, 2021; Creswell, 2020; Field, 2018). The use of this design is effective to see changes in students' understanding due to image media interventions, which are considered to be able to help visualize abstract concepts of the water cycle so as to increase understanding and motivation to learn (Yuliana & Hartati, 2021).

RESULT AND DISCUSSION

This study aims to test the effectiveness of the use of image media in improving the understanding of the concept of the water cycle in Grade V (FIVE) students of SDN 12 Mataram. Data obtained through pretest and posttest showed a very significant increase in student understanding after being given learning with image media. The average pretest score of 58.2 with a standard deviation of 8.6 illustrates that students' initial understanding of water cycle material is still relatively low to moderate. The range of pretest scores between 45 to 70 indicates a variation in students' ability to understand the concepts taught before the learning intervention. This condition indicates that water cycle material is still a challenge for most students because the concept is abstract and involves complex scientific processes such as evaporation, condensation, precipitation, and infiltration.

After the application of image media in learning for two meetings, there was an increase in the average score of the posttest to 82.7 with a standard deviation decreasing to 6.4. This decrease in standard deviation shows that student understanding has become more consistent, with a reduction in the gap in learning outcomes between high-ability and low-ability students. This is an indication that image media is effective in helping students who previously had difficulty understanding the concept of the water cycle to achieve an equal understanding with other students. The difference in pretest and posttest values was statistically analyzed using the paired sample t-test which yielded a t-value of -14.257 with $p = 0.000$ ($p < 0.05$). These results confirm that the difference between the before and after learning scores is statistically significant, so it can be concluded that image media plays a very effective role in improving students' understanding of science concepts.

In addition to quantitative results, data on observation of student activities during learning provide additional insight into student involvement cognitively and affectively. Observations show that about 80% of students show a high level of activity. They seem enthusiastic about paying attention to image media, actively asking questions to clarify concepts they do not understand, and dare to participate in answering teachers' questions. This activeness is an important indicator that image media not only facilitates cognitive understanding of concepts, but is also able to arouse students' motivation to learn and interest in the material presented. In contrast, only three students were classified as passive in learning. This indicates that additional approaches or strategies may be needed so that all students can be optimally involved in the learning process. The high learning activity during this learning process is also consistent with the findings of Fredricks, Blumenfeld, and Paris (2004) who stated that students' cognitive and affective involvement play a crucial role in learning success. Sari and Lestari (2021) also added that visual media such as pictures can increase the attractiveness of learning, making the learning process more interactive and fun. Image media makes it easier for students to visualize abstract and dynamic natural phenomena, thus helping to overcome the limitations of understanding that have been an obstacle in science learning, especially water cycle materials.

The discussion of these results can be supported by the Dual Coding theory developed by Paivio (1986). According to this theory, humans process information through two main cognitive channels, namely the visual channel and the verbal channel. When information is presented simultaneously through both channels, the understanding and recall of the material becomes stronger and deeper than if only one channel were used. In the context of water cycle learning, the image media used in this study provides a concrete representation of the abstract evaporation, condensation, and precipitation processes. This systematic and systematic visualization helps students build a clearer and more complete mental model, so that the learning process becomes more effective. Furthermore, the phenomenon of the water cycle, which is dynamic and involves various stages that are difficult to observe directly, is often a barrier for students in understanding the relationship between the processes. With the medium of images, students can relate the teacher's verbal explanation with a concrete visual picture, so that the abstraction of the concept becomes easier to accept.

This learning approach not only improves conceptual understanding, but also strengthens students' memory and ability to reinterpret the concept of the water cycle in a sequential manner. The findings of this study also corroborate the results of a previous study

by Supriyadi (2019), which showed that the use of visual media in science learning is able to increase students' absorption and make the learning process more interactive and interesting. An interactive and fun classroom atmosphere is an important factor in building students' motivation to learn, which in turn will have a positive effect on their learning outcomes. This condition is very important, especially for science materials which often require students to understand concepts that are invisible and have a high level of abstraction.

Thus, the use of image media as an auxiliary medium in science learning is an effective and efficient learning strategy. Image media is not only able to improve understanding of the concept of the water cycle, but can also increase student engagement and motivation to learn. Teachers as learning facilitators should integrate visual media consistently, especially in teaching abstract science concepts that are difficult to visualize directly. This is expected to help students understand natural phenomena better, as well as foster a high interest and curiosity in science from an early age. Overall, this study provides empirical evidence that image media is a very useful learning tool in the context of science learning in elementary schools. This research is also a reference for educators and curriculum developers to continue to innovate in using learning media that support student learning success, especially on complex and abstract topics such as the water cycle.

CONCLUSION

Based on the results of research and data analysis, it can be concluded that the use of image media in science learning in Grade V (FIVE) of SDN 12 Mataram has proven to be effective in improving students' understanding of the concept of the water cycle. There was a significant improvement in both comprehension test scores and student engagement during learning. Picture media plays an important role in helping students overcome difficulties in understanding abstract concepts through concrete and interactive visualizations. Therefore, it is highly recommended that teachers consistently use visual media, especially image media, in science learning, especially on topics that are difficult to visualize directly. The systematic implementation of image media can not only improve learning outcomes, but also build students' interest and motivation to learn, which ultimately supports the achievement of more optimal science learning goals.

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