



## The Influence of Using Solar System Learning Videos on Discussion Skills and Concept Understanding of Grade VI Students of SDN 37 Bengkalis in Science Learning

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**Abstract:** This study aims to determine the influence of using solar system learning videos on the discussion skills and conceptual understanding of sixth-grade students at SDN 37 Bengkalis in science learning. The research employs an experimental method with a pretest-posttest control group design. The population of this study includes all sixth-grade students at SDN 37 Bengkalis, while the sample consists of two randomly selected classes. One class serves as the experimental group using the learning videos, and the other class acts as the control group using conventional teaching methods. Data were collected through tests measuring discussion skills and conceptual understanding before and after the treatment. Data analysis was conducted using t-tests and Mann-Whitney tests. The results indicate that the use of solar system learning videos significantly enhances students' discussion skills and conceptual understanding compared to conventional teaching methods. Therefore, learning videos can be an effective alternative teaching medium to improve the quality of science education in elementary schools.

**Keywords:** Learning Videos; Solar System; Discussion Skills; Conceptual Understanding; Science Learning.

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### 1. INTRODUCTION

Education is one of the fundamental aspects in the development of a nation (Irianto, 2017). In this era of globalization and rapid technological advancement, the education system is required to continuously adapt and innovate in order to prepare future generations to face the challenges ahead (Hakim, 2021). One of the key areas of knowledge that students must understand from an early age is Science, particularly the topic of the solar system, which forms the foundation for understanding the universe and our position within it.

Science education at the elementary school level plays a strategic role in shaping students' initial understanding of natural phenomena and developing scientific thinking skills. However, the reality in the field shows that there are still many challenges faced in the teaching of science, especially on abstract topics such as the solar system. Students often find it difficult to visualize

complex astronomical concepts, which in turn affects their understanding of the material.

At SDN 37 Bengkalis, as with many other elementary schools in Indonesia, science learning, especially on the topic of the solar system, is still dominated by conventional methods that rely on textbooks and verbal explanations from teachers. Although these methods have been used for a long time, they are often less effective in engaging students and facilitating a deeper understanding of abstract astronomical concepts. As a result, many students struggle to comprehend the solar system material and are unable to apply their knowledge in broader contexts. In addition, students' ability to engage in discussions, an essential skill in 21st-century learning, has not been fully developed. Scientific discussions about natural phenomena, including the solar system, should be an integral part of science education. However, the lack of visual and contextual stimuli often makes it difficult for students to engage in meaningful and constructive discussions.

In this context, the use of technology in education, particularly educational videos, offers significant potential to overcome these challenges. Educational videos can present the material on the solar system in a more engaging, interactive, and easier-to-understand way for elementary school students (Muhlisoh, 2022). Through dynamic visualizations and structured narratives, educational videos can help students develop a more comprehensive understanding of complex astronomical concepts.

Several previous studies have shown the effectiveness of using audiovisual media to improve students' conceptual understanding and motivation in learning various subjects. For example, a study by Mu'minah (2021) found that using video media in science education can significantly improve students' learning outcomes. Similarly, a study by Alifa et al. (2021) revealed that video-based learning media could increase students' interest and understanding of science materials. However, although the potential of educational videos in enhancing the quality of science learning has been widely explored, there remains a gap in research regarding their effectiveness in the specific context of teaching the solar system at the elementary school level, particularly in relation to developing students' discussion skills. Therefore, this study aims to fill this gap by investigating the impact of using educational videos on students' discussion skills and conceptual understanding in the solar system material for grade VI students at SDN 37 Bengkalis.

The selection of SDN 37 Bengkalis as the research location is based on several considerations. First, this school represents the general characteristics of public elementary schools in the Bengkalis region, which face limitations in terms of access to modern learning technologies. Second, based on preliminary observations and discussions with science teachers at the school,

there is a recognized need to improve the quality of science education, especially on the topic of the solar system. Third, the school has shown enthusiasm and support for innovative teaching efforts through the use of technology.

This study is expected to make a significant contribution both theoretically and practically. Theoretically, the results of this study will enrich the literature on the effectiveness of educational videos in the context of science education at the elementary school level, particularly in teaching the solar system. Practically, the findings of this study can serve as a reference for educators and policymakers in developing more effective and engaging science teaching strategies for elementary school students.

In the context of elementary school science education, understanding the solar system holds special significance. This material not only provides insights into the structure and dynamics of the universe but also serves as a gateway for students to develop scientific thinking and an appreciation for the complexity of nature (Mu'minin et al., 2023). However, the abstraction of astronomical concepts often poses a challenge for elementary school students who are still in the concrete operational stage of cognitive development. This is where the role of visual learning media, such as videos, becomes crucial.

Educational videos on the solar system, with their ability to combine visual, audio, and narrative elements, can bridge the gap between abstract concepts and students' concrete understanding (Lubis et al., 2022). Through animations and simulations, videos can demonstrate astronomical phenomena that are difficult to observe directly, such as the movement of planets, the process of eclipses, or the scale comparison of celestial bodies. This allows students to build a more accurate mental model of the solar system and the relationships between its components. Additionally, the use of educational videos has the potential to stimulate students' curiosity and interest in science and technology (Muhliso, 2022). In an era where scientific literacy is becoming increasingly important, fostering students' enthusiasm for science from an early age is a strategic step in preparing a generation ready to face future challenges. Well-designed educational videos can present scientific material in an engaging way that is relevant to students' daily lives, thereby increasing their motivation to learn (Nurfadhillah et al., 2021).

Another important aspect is the development of students' discussion skills. In the modern educational paradigm, communication and collaboration skills are considered essential skills that students must master (Zubaidah, 2016). Scientific discussions about the solar system can serve as an effective means of honing critical thinking skills, the ability to argue, and respect for others'

opinions. Educational videos can provide visual stimuli and factual information that serve as rich discussion material, enabling students to engage in deeper and more meaningful scientific conversations (Ismaniati, 2012).

It is important to emphasize that the effectiveness of educational videos is not automatic. Their implementation needs to be integrated with appropriate teaching strategies and supported by the teacher's readiness to facilitate the learning process. Therefore, this study will also consider pedagogical aspects in the use of educational videos, including how teachers prepare and follow up on video screenings, as well as how they facilitate productive class discussions. Considering the complexity and urgency of the issues outlined above, this study is expected to provide comprehensive insights into the potential and challenges of using educational videos in teaching the solar system at the elementary school level. The results of this study will not only benefit SDN 37 Bengkalis but also serve as a valuable reference for efforts to improve the quality of science education in other elementary schools across Indonesia.

Therefore, the researcher will conduct a study titled "The Impact of Using Educational Videos on the Solar System on Students' Discussion Skills and Conceptual Understanding in Grade VI Students at SDN 37 Bengkalis in Science Education."

## 2. METHOD

The type of research used in this study is quantitative research with an experimental approach. Hadari Nawawi emphasizes the basic concept of experimental research, stating that such research must reveal the cause-and-effect relationship between variables and test the influence of these two variables. Iskandar also explains that experimental research is a type of research that requires researchers to observe the cause-and-effect relationships between two variables by providing additional treatment (treatment) to the experimental group, as opposed to the control group which does not receive this treatment.

The research design used in this study is a quasi-experimental design, which involves both a control group and an experimental group. However, in this study, the control group does not fully function to control the external variables that affect the implementation of the experiment. A quasi-experimental design approach is used because, in practice, it is difficult to find a control group for the research (Sugiyono, 2018).

The population is the entire number of objects or subjects that possess certain characteristics and qualities as determined by the researcher to be studied and then drawn into conclusions (Ihsan

& Suharman, 2022). The population is not merely the quantity of objects/subjects studied but includes the entire set of characteristics or qualities possessed by the subjects or objects being researched. In this study, the population consists of the 6th-grade students of SDN 37 Bengkalis, which include two classes, VI A and VI B, totaling 53 students.

The data analysis technique used in this study is a comparative test (t-test). Before the data is analyzed using the t-test, prerequisite tests must first be conducted, including normality tests and homogeneity tests.

### 3. RESULTS AND DISCUSSION

Based on the results of the normality test for the pre-test and post-test data on students' discussion skills and conceptual understanding, it can be concluded that the data obtained comes from a population that is normally distributed. Therefore, further analysis can be conducted using hypothesis testing, specifically the Mann-Whitney U test. The results of the Mann-Whitney U analysis for students' discussion skills showed a value of 342.500 and Wilcoxon W of 667.500 for the pre-test and post-test. These values indicate that the distribution of discussion skill scores between the two class groups is very similar, both before and after the intervention or teaching. This shows that there is no significant difference in discussion skills between the two groups, either in the pre-test or post-test, supported by the high p-value (0.892). Thus, it can be concluded that the teaching provided did not result in significant changes in discussion skills between the two groups.

Furthermore, the results of the Mann-Whitney U analysis for students' conceptual understanding showed a similar outcome to the discussion skills analysis. Although there were differences between the experimental and control groups, the treatment given was not effective enough to produce significant changes in students' conceptual understanding. This indicates that although there were differences in scores between the two groups, there was no substantial change in conceptual understanding after the teaching was conducted.

Based on the pre-test and post-test results from both the experimental and control classes, it was found that the experimental class consisted of 53 students. In the experimental class, which used video-based learning on the solar system, the average post-test score for discussion skills and conceptual understanding was 86.6, with the lowest score being 60 and the highest reaching 100. Meanwhile, in the control class, which used conventional learning methods, the average post-test score was 62.25. From this data, it is evident that there is a significant difference between

the average post-test scores of discussion skills and conceptual understanding between the experimental and control classes, with a difference of 16.15. This indicates that the use of video-based learning on the solar system in the experimental class was more effective in improving students' discussion skills and conceptual understanding compared to the conventional learning model used in the control class.

The results of this study align with the research conducted by Lubis et al. (2022), which developed a science video on the Solar System to improve students' understanding. In their study, the science video was developed using the ADDIE model and included basic competencies, learning objectives, material descriptions according to the syllabus, and videos depicting the movement of the solar system. Evaluation in the form of multiple-choice questions was used to measure students' understanding, with final scores appearing after the students completed the questions. One of the advantages of this video-based learning is the game-based questions, which allow students to actively participate in the learning process. The media feasibility test by media experts showed a feasibility rating of 86.6%, which is considered very feasible, while the evaluation from subject matter experts reached 90%, also in the very feasible category. Based on these results, the science video on the Solar System is deemed suitable for use in the learning process.

This video-based learning serves not only as a tool for students but also assists teachers in interacting with students in the classroom. Video-based learning can be understood as the storage of moving images that are displayed on a television screen or similar device, helping to explain the material more clearly and attractively. The use of video-based learning allows teachers to overcome time limitations when explaining the material in-depth. Additionally, this video can also enhance students' understanding and motivation when they face difficulties in comprehending the lesson material (Lubis et al., 2022). For further research, it is recommended that researchers explore the effectiveness of various types of video-based learning media in broader contexts, such as for other subjects or by expanding the research scope to higher levels of education.

#### 4. CONCLUSION

Based on the pre-test and post-test results from the experimental and control classes, it was found that the experimental class consisted of 53 students. The post-test results for discussion skills

and conceptual understanding in the experimental class showed an average score of 86.6. The lowest score for discussion skills and conceptual understanding using the video-based learning on the solar system was 60, while the highest score was 100. In contrast, the control class, which used conventional learning methods, had an average post-test score of 62.25.

From this data, it is evident that there is a difference of 16.15 in the average post-test scores for discussion skills and conceptual understanding between the experimental and control classes. Therefore, we can conclude that the average post-test scores for discussion skills and conceptual understanding in the experimental class using video-based learning on the solar system are better than the average post-test scores in the control class, which used conventional learning methods.

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