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# The Influence of the Problem-Based Learning Model Assisted by Short Video Learning on the Curiosity and Understanding of Science Subject Concepts of Grade III Elementary School Students

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**Abstract:** This study aims to examine the influence of the Problem-Based Learning (PBL) model assisted by short video learning on the curiosity and concept understanding of third-grade students in science subjects at SD Negeri 15 Sungai Gayung Kiri. The research method used is a quasi-experimental design with a pretest-posttest control group. The population of this study is all third-grade students at SD Negeri 15 Sungai Gayung Kiri, with a research sample of 60 students divided into an experimental class and a control class. The experimental class was taught using the PBL model assisted by short video learning, while the control class received conventional teaching. The results showed significant differences in concept understanding and curiosity between the experimental and control classes after the implementation of the PBL model assisted by short video learning. The Mann-Whitney U test analysis for pretest and posttest indicated that the use of the PBL model assisted by short video learning significantly increased students' curiosity and concept understanding. This improvement can be attributed to the more interactive and engaging teaching methods that encouraged students to be more involved and interested in the material taught. The conclusion of this study is that the Problem-Based Learning (PBL) model assisted by short video learning is effective in enhancing students' curiosity and concept understanding in science subjects.

**Keywords:** Problem-Based Learning (PBL); Short Video Learning; Curiosity; Concept Understanding; Science.

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## 1. INTRODUCTION

The development of information and communication technology has had a significant impact on various aspects of life, including education (Cholik, 2021). The Problem-Based Learning (PBL) model, supported by short video learning, represents a promising innovation to enhance the effectiveness of science learning, particularly in the topic of reproduction in living beings. This topic is inherently complex and requires deep understanding. Concepts such as reproduction, embryonic development, and life cycles are crucial for students to grasp in order to understand reproductive processes in living organisms (Alisa et al., 2022).

Curiosity is an essential factor in the learning process. Students' interest and curiosity about the subject matter can motivate them to actively seek knowledge and understand the concepts being taught (Fadella et al., 2018). The PBL model offers an interactive and in-depth learning experience. By utilizing short videos and computer simulation technology, students can engage directly in observation and experimentation, allowing them to explore reproduction concepts visually and practically.

PBL (Problem-Based Learning) is a learning approach where students learn through solving problems relevant to real life (Agusdianita et al., 2023). In this model, learning begins with the presentation of a complex problem or challenge that requires resolution. Students identify and analyze relevant information, formulate hypotheses, develop problem-solving strategies, and seek applicable solutions. PBL emphasizes project-based, collaborative, and contextual learning, where students are actively involved in exploring lesson materials and constructing their understanding (Sofyan et al., 2016). Teachers act as facilitators, guiding the learning process, providing support, and offering constructive feedback. One of the primary goals of the PBL model is to develop students' critical thinking, problem-solving, communication, teamwork, and independent learning skills (Darwati & Purana, 2021). By providing problem-oriented learning experiences, PBL also helps students relate their knowledge to real-world situations, thereby increasing the relevance and applicability of their learning.

Short videos are a format of short-duration videos, usually lasting a few seconds to a few minutes. This format is popular on social media platforms like TikTok, Instagram Reels, and YouTube Shorts. Short videos are often used to convey messages, stories, or information concisely and directly, making them suitable for capturing the attention of audiences with limited attention spans. They can feature diverse content, including light entertainment, tutorials, lip-syncing, challenges, and quick learning. Short videos are also effective for sharing experiences, expressing creativity, and interacting with communities quickly and easily. Using the PBL model with short video assistance can provide students opportunities to develop critical thinking and problem-solving skills. They can design experiments, collect data, analyze results, and draw conclusions based on the studied reproduction concepts.

Curiosity plays a vital role in deepening students' understanding of the reproduction of living beings. By using the PBL model supported by short videos, students are expected to feel encouraged to explore further, ask questions, and seek additional information related to the studied concepts (Wedyawati & Lisa, 2019). In conventional learning, time constraints, equipment

limitations, or teaching materials can sometimes hinder a comprehensive approach to teaching reproduction in living beings. The PBL model supported by short videos offers a solution to these challenges by providing greater accessibility and flexibility in learning.

This research is expected to contribute to developing innovative and effective science teaching methods. By exploring the potential of virtual lab learning media as a teaching tool, students are anticipated to become more active, enthusiastic, and gain a better understanding of the reproduction of living beings, particularly at SD Negeri 15 Sungai Gayung Kiri.

One of the problems faced at SD Negeri 15 Sungai Gayung Kiri is the lack of innovative teaching media to attract students' interest and improve their understanding. Although teachers strive to explain the material well, students often fail to answer questions or complete assignments given to them. This indicates that students' conceptual understanding remains inadequate. The lack of interactive and engaging teaching methods is a primary cause of this issue.

Traditional teaching methods are often insufficient in sparking students' curiosity, which impacts their conceptual understanding in science subjects. One solution to this problem is implementing the PBL model assisted by short video learning. Short educational videos have the potential to provide clear and engaging illustrations of scientific concepts while facilitating a more interactive and contextual learning experience.

However, at SD Negeri 15 Sungai Gayung Kiri, there are also issues related to technology access. Frequent internet disruptions hinder students and teachers from accessing online learning resources. This affects the use of technology-based teaching media, which should enhance students' interest and understanding. Nonetheless, short educational videos that can be downloaded and used offline present an effective alternative to overcoming network constraints.

This research, titled “The Effect of the PBL Model Supported by Short Video Learning on Curiosity and Conceptual Understanding of Science in Third-Grade Elementary School Students,” aims to examine the effectiveness of combining the PBL model with short video learning media in enhancing students' curiosity and conceptual understanding in science. This approach is expected to provide a solution tailored to the conditions and challenges faced at SD Negeri 15 Sungai Gayung Kiri while positively impacting students' learning outcomes.

## 2. METHOD

This research is experimental in nature. Experimental research is conducted to test the cause-and-effect relationship between the treatment given to the experimental group and the control group (Abraham & Supriyati, 2022). In this case, the impact of the PBL model supported by short

video learning on the conceptual understanding and curiosity regarding the topic of reproduction in living organisms among third-grade elementary school students will be examined. The research design used is the pretest-posttest with control group design. This design involves measuring students' conceptual understanding and curiosity about reproduction in living organisms before and after treatment and comparing the results between the group using the PBL model supported by short videos (experimental group) and the group not using this model (control group).

The population in this study comprises all third-grade students at SD Negeri 15 Sungai Gayung Kiri. The total population consists of 60 students from two parallel classes, IIIA and IIIB. These two classes share similar characteristics in terms of academic and socio-economic backgrounds, making them representative subjects for measuring the effect of the Problem-Based Learning (PBL) model supported by short video learning on curiosity and conceptual understanding in science subjects.

The sample for this study is drawn from the third-grade student population at SD Negeri 15 Sungai Gayung Kiri. Class IIIA, consisting of 30 students, is selected as the experimental class, where the students will receive instruction using the Problem-Based Learning (PBL) model supported by short video learning. Meanwhile, Class IIIB, also consisting of 30 students, will serve as the control class, where students will undergo traditional instruction without the aid of short video learning. The sample selection is conducted purposively, taking into account the equivalence of characteristics between classes to ensure that the results accurately and validly measure the effects of the treatment provided.

## 3. RESULTS AND DISCUSSION

The data analysis results show that the pretest and posttest data for the curiosity variable in both the experimental and control classes are not normally distributed. Based on the Kolmogorov-Smirnov and Shapiro-Wilk normality tests, all significance values were below 0.05 for both pretest and posttest, indicating that the data did not meet the assumption of normality. Therefore, data analysis was conducted using non-parametric methods. Furthermore, the homogeneity of variance test results showed that the pretest variance for curiosity was not homogeneous, with a Levene Statistic value based on the mean of 22.060 ($p < 0.001$). However, in the posttest, the variance between the two groups approached homogeneity, with a significance value of 0.059.

For the conceptual understanding variable, the normality test results also indicated that the pretest and posttest data were not normally distributed. The pretest in the experimental class had Kolmogorov-Smirnov and Shapiro-Wilk significance values of 0.002 and 0.007, respectively, while the posttest values were 0.056 and 0.009. Similar results were found in the control class. The homogeneity of variance test showed that the pretest variance for conceptual understanding was homogeneous, with a Levene Statistic value of 0.130 ($p = 0.719$). However, the posttest variance was not homogeneous, with a Levene Statistic value of 19.455 ($p < 0.001$), indicating a significant difference after the intervention.

The results of the Mann-Whitney U test for the curiosity variable showed a significant difference between the experimental and control classes. In the pretest, the U value was 0.000 with a significance of 0.000, and in the posttest, the U value was also 0.000 with a significance of 0.000. This indicates that the Problem-Based Learning (PBL) model assisted by short video learning significantly increased students' curiosity. This improvement is likely due to the interactive and engaging learning method, which encourages students to be more involved in the learning material.

Similar results were found for the conceptual understanding variable. In the pretest, the U value was 229.000 with a significance of 0.001, while in the posttest, the U value was 0.000 with a significance of 0.000. The greater difference in the posttest confirms that the PBL model assisted by short video learning is effective in improving students' conceptual understanding. This improvement is supported by the ability of short videos to visualize abstract concepts, making them easier to understand.

These findings align with the study by Barak and Dori (2011), which stated that PBL can enhance critical thinking and problem-solving skills through a student-centered learning approach. Additionally, Mayer (2009) argued that the use of visual media such as videos can improve students' understanding of complex materials. This is supported by the cognitive multimedia theory, which states that the combination of images and text can enhance understanding and information retention.

Overall, the findings of this study indicate that the use of the PBL model assisted by short video learning has a significant effect on improving students' curiosity and conceptual understanding in science learning. Therefore, teachers are encouraged to use this method more frequently to enhance students' motivation and learning outcomes. Moreover, schools should

provide adequate facilities and resources to support the implementation of this learning model. Further research is recommended to explore the effects of PBL assisted by short video learning on other subjects and different educational levels.

## 4. CONCLUSION

This study proves that the Problem-Based Learning (PBL) model assisted by short video learning has a positive and significant effect on the curiosity and conceptual understanding of third-grade students in science subjects. This model not only enhances student engagement and motivation but also helps them gain a deeper and more contextual understanding of scientific concepts. Therefore, the implementation of this method is worth considering as an effective teaching strategy in elementary schools.

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