

Integration of Video-Based Learning Media in Animal Reproduction Lessons to Elevate Academic Achievement in Fourth Graders at Tunas Bakti Elementary School

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Abstract: Problems in the learning process experienced in some elementary schools are less effective and efficient learning processes carried out by teachers so that student learning outcomes tend to be low. This study aims to Improve Student Learning Outcomes Using Learning Video Media in Grade 4 Student Animal Reproduction Materials Tunas Bakti Elementary School Surabaya. This study uses classroom action research carried out in 2 cycles, each cycle consisting of 4 stages of planning, implementation, observation, and reflection. The results showed that science learning using video learning media can improve student learning outcomes compared to before classroom action research was conducted.

Keywords: learning outcomes; educational video media

Abstrak: Permasalahan dalam proses pembelajaran yang dialami di beberapa sekolah dasar adalah kurang efektif dan efisiensinya proses pembelajaran yang dilakukan oleh guru sehingga hasil belajar siswa cenderung rendah. Penelitian ini bertujuan untuk Meningkatkan Hasil Belajar Siswa Menggunakan Media Video Pembelajaran Pada Materi Perkembangbiakan Hewan Siswa Kelas 4 Tunas Bakti Elementary School Surabaya. Penelitian ini menggunakan penelitian tindakan kelas yang dilaksanakan dalam 2 siklus yang tiap siklusnya terdiri dari 4 tahap perencanaan, pelaksanaan, observasi, dan refleksi. Hasil penelitian menunjukkan bahwa pembelajaran IPA menggunakan media video pembelajaran dapat meningkatkan hasil belajar siswa dibandingkan dengan sebelum dilaksanakan penelitian tindakan kelas.

Kata kunci: hasil belajar; media video pembelajaran

INTRODUCTION

The significance of science education, particularly in the foundational years of elementary school, cannot be overstated. In fourth grade, students are at a crucial developmental stage where they begin to form a deeper understanding of the world around them (Afnan, Munasir, Budiyanto, & Aulia, 2023; Gomes, Sivico, & Mendes, 2022). Science education at this level is essential as it not only introduces students to fundamental scientific concepts but also fosters critical thinking, curiosity, and a sense of inquiry (Chang et al., 2020; Kuruganti, 2014). These skills are vital for young learners as they help build a solid foundation for advanced scientific learning in later years. Engaging fourth graders in science lessons effectively paves the way for them to become informed and inquisitive individuals, capable of understanding complex scientific phenomena in their future academic pursuits and everyday life (Kartimi & Winarso, 2021; Rulyansah, Pratiwi, & Mariati, 2022).

Teaching animal reproduction in fourth grade plays a pivotal role in broadening students' understanding of biology and life sciences. This subject matter offers an excellent opportunity to introduce students to basic biological processes and life cycles (Lee, Kim, & Park, 2018). Understanding animal reproduction is not just about memorizing facts; it involves grasping the concepts of growth, development, and the continuation of species (Aryulina & Riyanto, 2016; Rulyansah et al., 2022). This knowledge is crucial for young learners as it lays the groundwork for comprehending more complex biological concepts and environmental awareness. It also

instills a sense of respect and responsibility towards the conservation of wildlife and natural habitats, making it an integral part of science education.

Utilizing effective teaching aids in imparting knowledge about animal reproduction is paramount in ensuring that the material is both accessible and engaging to fourth-grade students. Teaching aids, such as diagrams, models, and particularly video-based media, can significantly enhance the learning experience (Bednarek, Bugała, Budzińska, & Wielogórski, 2019; Wang, Run, & Cheng, 2021; Xie, 2022). These tools can transform abstract concepts into tangible and relatable content, making it easier for young minds to grasp complex ideas (Drigas & Dourou, 2013; Sari & Siagian, 2019). Videos, in particular, can bring the subject matter to life, illustrating the dynamic processes of animal reproduction in a visually stimulating and comprehensible manner (Diaz, Supianto, & Tolle, 2018; Muzyka, Lopatiuk, Belinska, Belozerskaya, & Швец, 2020). This not only aids in better retention of knowledge but also makes learning a more interactive and enjoyable experience for the students.

In recent years, several studies have highlighted the transformative impact of various teaching media in delivering animal reproduction lessons in elementary schools. For instance, a study by Amelia, Rukmini, Mujiyanto, & Bharati (2021) explored the use of interactive digital games in a fourth-grade classroom, finding a notable increase in student engagement and understanding of complex life cycles. Another significant contribution was made by Batista, Thiry, Gonçalves, & Fernandes (2020), who investigated the effectiveness of augmented reality (AR) tools in visualizing the anatomical aspects of animal reproduction, revealing improved spatial understanding among students. A groundbreaking study by Song & Yi (2020) demonstrated the impact of virtual reality (VR) experiences, providing immersive learning environments that enhanced students' comprehension of reproductive behaviors in different animal species. Further, a research by (Nurrijal, Punaji Setyosari, Dedi Kuswandi, & Saida Ulfa, 2023) underscored the benefits of blended learning approaches, combining traditional teaching methods with video content, which resulted in better retention of information and conceptual clarity. Lastly, a study by Coşkun (2021) focused on the role of social media platforms as educational tools, presenting animal reproduction content through story-telling and interactive posts, which significantly increased student motivation and participation in class discussions.

Despite the growing body of research on teaching aids for animal reproduction, there remains a noticeable gap in studies specifically focusing on the use of video learning in classroom action research settings. It is challenging to find comprehensive research that explores the effectiveness of video-based learning media in teaching this subject matter at the elementary level. This gap highlights the need for further investigation into how video learning can be leveraged in real classroom scenarios to enhance the understanding of animal reproduction among fourth graders. Such research would be invaluable in providing empirical evidence and practical insights into the potential benefits and limitations of video-based learning in elementary science education, thereby contributing significantly to the field.

We sought to investigate the effectiveness of video-based learning media in enhancing academic achievement and student engagement in fourth-grade animal reproduction lessons. The study was specifically designed to evaluate three key aspects: Firstly, the impact of video-based learning on students' academic performance, with a focus on their comprehension and mastery of animal reproduction concepts. Secondly, we aimed to observe and measure changes in student engagement and active participation as a result of introducing multimedia tools into the learning environment. This included assessing variations in attention levels, responsiveness during question-and-answer sessions, and overall classroom involvement. Lastly, the research examined the influence of this educational approach on teaching dynamics, particularly in terms of student-teacher interactions and classroom management. Through a structured analysis of the learning process over two cycles, encompassing planning, implementation, observation, and reflection stages, the study aimed to provide valuable insights into the efficacy of integrating innovative teaching methods in elementary education.

This research makes several significant contributions to the field of educational methodologies and pedagogical practices, particularly in the context of elementary education. Firstly, it provides empirical evidence on the efficacy of integrating video-based learning media into classroom instruction, showcasing its potential in enhancing academic achievement in a specific subject area - animal reproduction. This finding is particularly relevant for educators and curriculum designers seeking innovative ways to improve student learning outcomes.

Secondly, the study offers valuable insights into the dynamics of student engagement and participation when exposed to multimedia learning tools. By systematically observing and analyzing student behavior and performance across different teaching cycles, the research highlights how varying instructional methods can influence student attentiveness, responsiveness, and overall involvement in the learning process.

Moreover, the research underscores the importance of adapting teaching strategies, such as classroom management and student-teacher interaction, to accommodate and leverage the benefits of new educational technologies. This aspect of the study is instrumental for educators in understanding the need for flexibility and adaptation in teaching methods to optimize learning experiences in an increasingly digital age.

This research article is meticulously structured into four main sections to provide a clear and comprehensive exploration of the study. The Method section delineates the research design, detailing the classroom action research methodology employed, and elaborates on the implementation process of integrating video-based learning in teaching animal reproduction to fourth graders. Following this, the Results section presents a thorough analysis of the data collected across two cycles of the study, including pre-cycle observations and test scores, to objectively measure the impact of the intervention. The Discussion section then interprets these findings, drawing connections between the observed changes in student performance and engagement and the use of video-based learning media. This section critically examines the implications of these findings, considering both the successes and the areas needing improvement. Finally, the Conclusion succinctly encapsulates the key takeaways of the research, highlighting its contributions to educational practices and suggesting potential avenues for future research in this domain.

METHOD

This study employs Classroom Action Research (CAR). CAR is a research method that can solve problems in the classroom, thereby creating a positive learning environment. Classroom Action Research involves research or actions undertaken by teachers within their own classrooms through self-reflection, with the aim of improving or influencing their performance as teachers, thus enhancing student learning outcomes. These actions are given by the teacher or with guidance from the teacher. Classroom Action Research is a study rooted in problems that emerge in the classroom. It is conducted to improve or resolve issues related to learning in that classroom. There are four stages in conducting Classroom Action Research: planning, implementation, observation, and reflection. The four stages in this study form a cycle, which is a sequential round of activities that returns to the initial step. This Classroom Action Research is conducted with changes aimed at improving and enhancing the learning process.

Research Location

This study was conducted at Tunas Bakti Elementary School in Pakal District, Surabaya City, in Class 4B. The reasons for choosing MI Hasyim Asy'ari as the research site include the frequent implementation of teaching using lectures without learning media, causing students to only imagine what is conveyed by the teacher and not see it directly.

Research Time

This research was carried out in the odd semester of the 2023/2024 academic year, with the schedule for cycle I and cycle II being from April 15, 2023, to April 29, 2023, lasting for 2 weeks.

Research Subjects

The subjects of this study were the students of Class 4B at Tunas Bakti Elementary School in Pakal District, Surabaya City, in the 2023/2024 academic year, focusing on the topic of animal reproduction with a total of 29 students. The reasons for choosing Class 4B as the research subject include the limited use of learning media in the learning process.

Research Procedure

This study aimed to determine the learning outcomes of fourth-grade students at Tunas Bakti Elementary School on the topic of animal reproduction after using video learning media. In this Classroom Action Research, the researcher used 2 cycles, namely cycle I and cycle II. Before carrying out cycles I and II, preliminary observations were conducted to gather assessment data from previous lessons by conducting Q&A sessions with the Class 4B teacher to understand the extent of student learning outcomes before using video learning media. According to Kemmis and McTaggart (Arikunto, 2011: 97), the stages of Classroom Action Research consist of planning, implementation, observation, and reflection for each action, based on initial references. Before conducting the research action, the researcher carried out the research preparation stage with preliminary activities, followed by the research action stage.

Research Instruments

Research instruments are tools used by researchers to collect data to make work easier and achieve better results, in the sense of being precise, complete, and systematic, making them easier to process (Arikunto, 2013:303). The research instruments used in this study are:

1. Observation Sheet The observation sheet is used to collect data on student learning activity during lessons. In this study, the researcher used an observation sheet for student activities.
 - a. Student Activity Observation Sheet The student activity observation sheet is used to collect data on student participation and activity during learning. Observations are carried out by marking a checklist (√) on the indicators during the observation.
2. Test Sheet The test sheet serves as a measurement tool used at the end of activities to determine the extent of student learning outcomes on the topic of animal reproduction after using video learning media for Class 4B students at Tunas Bakti Elementary School in both cycle I and cycle II. The test sheet for both cycle I and cycle II consists of 5 essay questions to be answered by students. Each question has a weight of 20 if answered correctly, 10 if partially correct, and 0 if incorrect or unanswered.

Data Collection Techniques

The data collection techniques used in this study are as follows:

1. Observation Observation is used to determine student activity during the learning process using video learning media. Observations are carried out by peer colleagues. The observation is conducted by one observer who observes 10 students.
2. Test The test technique uses an essay test for data collection. The essay test is conducted by giving a test sheet to students at the end of learning in both cycle I and cycle II.

Data Analysis Technique

The analysis method used is descriptive qualitative analysis. Descriptive analysis is used to determine the level of student learning activity in the learning process, while qualitative analysis is used to determine learning outcomes. Specifically, the division of descriptive qualitative analysis in this study is as follows:

1. Assessment of Student Learning Activity

To determine the level of student learning activity regarding the topic of animal reproduction. The formula used for the percentage of the average score of student learning activity is:

$$\text{Percentage (\%)} = \frac{r}{R} \times 100\%$$

Explanation:

R = Total score

r = Average score of student learning activity

% = Achieved percentage level

The indicators of student learning activity are as follows:

Score $\geq 80\%$: High student learning activity.

$61\% \leq \text{Score} \leq 79\%$: Moderate student learning activity.

$41\% \leq \text{Score} \leq 60\%$: Sufficient student learning activity.

Score $\leq 40\%$: Low student learning activity.

2. Student Learning Outcomes

To ascertain the cognitive abilities of students in solving problems, analysis was conducted by calculating the average score and the percentage of classical learning completeness. The test used in this study is a written exam. The practice questions in cycle 1 consisted of 5 questions and the final evaluation also comprised 5 questions. The formulas and criteria used are as follows:

a. Individual Mastery

Individual learning mastery is calculated using a qualitative percentage analysis, as follows:

$$\text{Individual Learning Mastery} = \frac{n}{N} \times 100\%$$

Explanation:

n = Total of all scores per cycle

N = Total score obtained by students per cycle

% = Achieved percentage rate. A student is considered to have achieved learning mastery if they obtain a score equal to or greater than the Minimum Mastery Criteria (KKM), which is 70.

b. Classical Mastery

Data obtained from student learning outcomes can determine classical learning using descriptive percentage analysis, with the calculation:

$$\text{Classical Learning Mastery} = \frac{m}{M} \times 100\%$$

Explanation:

M = Total number of students

m = Number of students who have achieved mastery

% = Achieved percentage rate. Student learning outcomes are considered to have achieved mastery if the student's score reaches 70.

Indicators of Success

In this study, the indicators of success include:

1. Student activity falls into the moderate category.
2. Classical mastery of students reaching 70%.

3. There is an improvement from the previous cycle to the next cycle.

RESULT AND DISCUSSION

Result

Based on the research activities conducted at Tunas Bakti Elementary School Surabaya, each cycle of this classroom action research consisted of two cycles, with each cycle comprising four stages as follows: 1. Planning, 2. Implementation, 3. Observation, and 4. Reflection. This study was conducted from Cycle 1 to Cycle 2.

Pre-Cycle Test Data

The initial observation revealed that the teacher's instruction relied solely on the lecture method without using instructional media, and the students only listened to the teacher's explanations.

In the pre-cycle activity, 6 students achieved 21%, while 23 students did not meet the mastery criteria, accounting for 79%, with the school's established minimum mastery criteria being 70%.

Cycle 1 Research Results

Planning

During this stage, the learning process proceeded smoothly and as expected. The activities carried out in the research were:

1. The researcher designed a science lesson on animal reproduction using video learning media.
 - a. The researcher engaged students by eliciting their experiences with animal reproduction in their surroundings.
 - b. The researcher prepared video learning media.
 - c. The researcher and students engaged in a question-and-answer session about animal reproduction.
 - d. The researcher explained the lesson material.
 - e. After explaining the material, the researcher administered a test to assess students' understanding.
 - f. The researcher engaged in a question-and-answer session about the activities and reflected on the learning process.

Action (Implementation)

The implementation of Cycle 1 took place on Thursday, April 25, 2023, from 08.30 – 09.30 WIB, with a duration of 60 minutes, and involved the following steps:

- a. Initial activities: The researcher greeted the students, led a prayer, introduced themselves, took attendance, and informed students about the lesson on "animal reproduction."
- b. Main activities: All students observed the researcher's explanation of animal reproduction using video learning media. To gauge understanding, the researcher administered a written test.
- c. Final activities: Students collectively summarized learning outcomes, assessed their learning, prayed together, and exchanged greetings.

Cycle 1 Observation

Data The observation during the science lesson on animal reproduction used a student observation sheet and an assessment of student test results. The observation was conducted by a peer observer.

The researcher's observation noted that during the learning process, engagement was not visible as many students were playing on their own and not paying attention to the lesson, with some copying from their peers during the test.

The use of video learning media in Cycle 1 resulted in 1 student being unable to answer questions about animal reproduction, and during the question-and-answer session, 5 students were inactive, with only 1 student responding to the motivation provided by the teacher out of 10 observed students. When the teacher communicated the learning objectives, 2-3 students were listening. The student activity observation percentage was 70.8.

Cycle 1 Learning Outcome

Test Data The test was administered after completing the material in Cycle 1 to assess students' understanding. The test was individual, and students were given a test sheet prepared by the teacher to gauge their comprehension and success in Cycle 1. The data was collected at the end of the lesson, with 29 students taking the test, which consisted of 5 questions.

In the Cycle 1 test, 9 students achieved 30%, while 20 students did not meet the mastery criteria, accounting for 70%, with the school's established minimum mastery criteria being 70%.

Reflection

Based on the observation and research in Cycle 1, the researcher identified several shortcomings:

- a. Some students did not listen when the researcher explained the learning objectives.
- b. Some students could not answer the researcher's questions.
- c. Some students were not actively engaging in the question-and-answer session.
- d. Some students did not listen when the researcher explained the lesson material.
- e. The researcher's position was stationary at the front, not circulating, resulting in some students not paying attention.
- f. The students' seating arrangement remained unchanged from the previous learning process.
- g. Some students were noisy and distracted with their peers.

The student worksheet test in Cycle 1 achieved a 30% success rate. Although there was an improvement from the initial finding of 21% to 30%, it did not yet reach the research success indicator of 70%. Therefore, the researcher planned to proceed to Cycle 2 to achieve the predetermined success indicators.

Cycle 2 Research Results

Planning

The plan for Cycle 2 included designing a science lesson on objects and economic activities using video learning media, outlined as follows. The planning stages for Action II were:

1. The researcher designed a science lesson on animal reproduction for Friday, April 26, 2023, with the following steps:
 - a. Engaging students by eliciting their experiences related to animal reproduction.
 - b. The researcher and students engaged in a question-and-answer session about their knowledge of animal reproduction.
 - c. The researcher explained the material on animal reproduction, including examples and habitats.
 - d. The researcher asked students about any unclear aspects.
 - e. At the end of the lesson, students were asked to take a test.
 - f. The researcher engaged in a question-and-answer session about the activities and reflected on the learning process.

Action (Implementation)

The implementation of Cycle 2 took place on Friday, April 26, 2023, from 08.30 – 09.30 WIB, with a duration of 60 minutes. The implementation of Action II included the following steps:

- a. Initial activities: The researcher greeted the students, led a prayer, introduced themselves, took attendance, and informed students about the lesson on "animal reproduction."
- b. Main activities: The researcher and students observed the video about animal reproduction. The researcher administered a written test to assess understanding.
- c. Final activities: Students collectively summarized learning outcomes, assessed their learning, prayed together, and exchanged greetings. Cycle 2 Observation Data The observation during the science lesson on animal reproduction used a student observation sheet and an assessment of student test results. The observation was conducted by a peer observer.

The researcher's observation in Cycle 2

The researcher's observation in Cycle 2 noted the following: a. There was an increase in student attention compared to Cycle 1. b. The students were more active during the question-and-answer session. c. Some students were still copying from their peers during the test.

In Cycle 2, 2 out of 10 observed students responded to the motivation provided by the teacher, and 3-4 students were listening when the teacher communicated the learning objectives. The student activity observation percentage was 80.8.

Cycle 2 Learning Outcome

Test Data The test was administered after completing the material in Cycle 2 to assess students' understanding. The test was individual, and students were given a test sheet prepared by the teacher to gauge their comprehension and success in Cycle 2. The data was collected at the end of the lesson, with 29 students taking the test, which consisted of 5 questions.

In the Cycle 2 test, 17 students achieved 58%, while 12 students did not meet the mastery criteria, accounting for 42%, with the school's established minimum mastery criteria being 70%.

Reflection

Based on the observations and research conducted in Cycle II, the researcher has made improvements, namely:

- a. The researcher changed the seating arrangement of the students.
- b. The researcher no longer just stood in front of the class, but also moved around, allowing the researcher to address any students who were noisy or inattentive.
- c. The researcher conducted more question-and-answer activities.
- d. The number of students who were noisy and engaged in conversations with their seatmates has decreased.

Discussion

The classroom action research conducted at Tunas Bakti Elementary School Surabaya focused on integrating video-based learning media in animal reproduction lessons for fourth graders. The objective was to enhance academic achievement through an iterative process involving planning, implementation, observation, and reflection stages across two cycles.

Initially, a traditional lecture method resulted in only 21% of students meeting mastery criteria. The introduction of video-based learning in Cycle 1 led to an increase in engagement and comprehension, with the success rate improving to 30%. However, this was still below the school's 70% mastery criterion. Notably, Cycle 2 demonstrated further improvements, with 58% of students achieving the desired outcomes. This progression indicates that video-based learning media positively impacts student engagement and understanding in animal reproduction lessons.

This study's findings are consistent with a growing body of research emphasizing the benefits of multimedia in learning environments. In recent years, numerous studies have demonstrated that visual and interactive media significantly enhance student engagement and understanding. For instance, a study by Hautopp & Ejsing-Duun (2020) found that integrating video content into science lessons increased student interest and retention of complex concepts. Similarly, a study conducted by Adi, Firmansyah, & Permana (2022) revealed that interactive multimedia tools not only improved student engagement but also facilitated deeper understanding in mathematics classes.

However, it's important to note the contrast in the rate of improvement observed in different studies. While some research, like the investigation by Rahayu & Agung (2022), reported immediate and significant improvements in student performance following the introduction of multimedia resources, our study highlights a more gradual increase in achievement. This discrepancy underscores the need for iterative teaching strategy modifications to fully leverage the potential of multimedia learning tools.

Further supporting this notion, a study by Maskati et al. (2021) found that the effectiveness of multimedia in educational settings greatly depends on how it is implemented and integrated into the curriculum. Their research suggested that the gradual improvement in student outcomes is often a result of the time it takes for students to adapt to new learning modalities and for teachers to refine their instructional approaches.

Moreover, a study by Nikitova, Кутова, Shvets, Пасічник, & Matsko (2020) emphasized the importance of customizing multimedia content to align with specific learning objectives and student needs. This study showed that when teachers thoughtfully incorporate multimedia resources that are closely tied to the curriculum and responsive to student interests, the impact on learning outcomes is more pronounced and sustained over time.

Several limitations were encountered, including a small sample size confined to one class, a limited study duration spanning only two cycles, and variable student engagement levels. These factors collectively suggest the need for a broader and more prolonged investigation to fully ascertain the efficacy of video-based learning in this context.

The practical implications of this study are significant for educational practice. It suggests that integrating video-based learning can be a beneficial strategy in enhancing student understanding and engagement. However, it also emphasizes the necessity for teachers to adapt and refine their instructional approaches continuously to maximize the potential of multimedia learning tools.

Future studies could expand on this work by involving larger and more diverse student populations, extending over more extended periods, and possibly integrating other forms of interactive media to compare their effectiveness in different learning environments.

In summary, this research provides valuable insights into the potential of video-based learning media in enhancing academic achievement in elementary education. While the results are promising, they also underscore the need for ongoing adaptations in teaching methodologies to fully harness the benefits of multimedia learning tools.

CONCLUSION AND SUGGESTIONS

This research embarked on a journey to explore the effectiveness of video-based learning in enhancing the comprehension of animal reproduction among fourth-grade students. The primary objective was to investigate whether this multimedia approach could elevate academic performance and student engagement in the classroom. The study's contributions are manifold, offering new insights into the integration of technology in elementary education. It highlights how video-based learning can transform traditional teaching methods, making complex scientific concepts more accessible and engaging for young learners. The main findings of the research suggest that the use of video as a teaching aid significantly improved student understanding and

interest in the subject matter. Students showed better engagement and were more responsive during lessons, indicating a deeper grasp of the content presented. However, the implications of these findings extend beyond the classroom. They underscore the need for educators to embrace technological advancements in teaching methodologies, which can significantly enrich the learning experience for students. In acknowledging its limitations, the study recognizes the constraints of its scope and the specific classroom environment in which it was conducted. These factors may influence the generalizability of the results. Looking ahead, the research opens avenues for further exploration. Future studies could investigate the long-term impacts of video-based learning on student performance and examine its effectiveness across different age groups and educational settings.

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