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Implementation of Quartet Card Learning Media Through the Problem-Based Learning Model on Animal and Human Locomotor Organs to Improve Learning Outcomes of Fifth-Grade Students at MI Muhammadiyah 1 Probolinggo in the 2022-2023 Academic Year

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Abstract:

This study aims to improve the learning outcomes of fifth-grade students at MI Muhammadiyah 1 Probolinggo in the subject of animal and human locomotor organs through the implementation of quartet card learning media with the Problem-Based Learning (PBL) model. The research method used is classroom action research (CAR), conducted in two cycles, consisting of planning, implementation, observation, and reflection stages. The subjects of this study were 30 fifth-grade students of MI Muhammadiyah 1 Probolinggo in the 2022-2023 academic year. Data were collected through learning outcome tests, observations, and interviews. The results of the study indicate an improvement in student learning outcomes after the implementation of quartet card media in PBL-based learning. The students' average scores increased from the first to the second cycle. Furthermore, student engagement and participation in the learning process also showed a significant increase. The use of quartet cards helped students understand the material more interactively and enjoyably, while the PBL model enhanced their critical thinking and problem-solving skills. Thus, the implementation of quartet card media in PBL-based learning can serve as an effective alternative for improving student learning outcomes, particularly in the subject of animal and human locomotor organs.

Keywords: Quartet Cards, Problem-Based Learning, Learning Outcomes, Movement Organs, Fifth-Grade Students.

INTRODUCTION

Effective learning requires innovative methods and media to help students better understand the material and improve their learning outcomes. One of the instructional models that can be implemented is Problem-Based Learning (PBL), which emphasizes solving real-world problems to encourage students' active engagement in learning (Arends,

2021). Additionally, the use of engaging learning media, such as quartet cards, can help students comprehend concepts in a more interactive and enjoyable manner. According to research conducted by Susanti et al. (2022), quartet card media has been proven to enhance students' motivation and learning outcomes by providing a more meaningful learning experience. However, at MI Muhammadiyah 1 Probolinggo, teaching is still dominated by conventional methods that do not actively involve students, which negatively impacts their understanding of the material, particularly in the topic of animal and human movement organs. Problem-Based Learning (PBL) is a learning model that focuses on problem-solving to improve students' comprehension of the concepts being studied. According to Rahmawati & Suryani (2021), PBL enhances students' critical thinking skills by actively involving them in finding solutions to given problems. This model also allows students to develop teamwork, communication, and self-reflection skills regarding their learning process. In the context of science education, PBL is highly relevant because it challenges students to directly observe natural phenomena and seek scientifically based solutions.

On the other hand, learning media also play a crucial role in improving instructional effectiveness. Quartet cards, as a visual and interactive medium, help students understand the concept of animal and human movement organs in a more engaging way. According to research conducted by Pratama et al. (2022), the use of quartet cards in science education enhances student engagement and accelerates their understanding of the material. This is due to the nature of quartet cards, which encourage students to learn through play, creating a more active and collaborative classroom environment. Unfortunately, the conventional teaching methods frequently used at MI Muhammadiyah 1 Probolinggo have resulted in low student learning outcomes in the topic of animal and human movement organs. According to the school's academic evaluation reports, students' average scores in this subject remain below the Minimum Mastery Criteria (KKM). Several contributing factors include the lack of student engagement in learning, minimal use of engaging learning media, and limited opportunities for students to develop their critical thinking skills.

Based on these issues, this study aims to implement quartet card learning media through the PBL model to improve the learning outcomes of fifth-grade students at MI Muhammadiyah 1 Probolinggo. It is expected that the combination of quartet card media and the PBL model will encourage students to be more active in learning, enhance their critical thinking skills, and improve their understanding of movement organ concepts. Research by Nugroho & Wulandari (2021) has shown that the application of PBL in science education can enhance students' conceptual understanding and critical thinking skills. Therefore, this study proposes an innovative approach by integrating quartet cards and PBL as a solution to improve learning quality and student achievement.

In addition to enhancing conceptual understanding, the use of quartet cards in the PBL model can also increase students' learning motivation. According to research by Putri & Hidayat (2023), students who learn using enjoyable and interactive media tend to have higher learning motivation than those who learn through conventional lecture methods. Increased motivation leads to greater enthusiasm in the learning process and facilitates better understanding of the material. Therefore, the combination of quartet cards and PBL is expected to create a more dynamic and student-centered learning environment.

Thus, this study is expected to contribute to the development of more innovative instructional strategies at MI Muhammadiyah 1 Probolinggo. The findings of this research are anticipated not only to improve students' learning outcomes in the topic of animal and human movement organs but also to serve as a reference for teachers in developing more engaging and effective teaching methods. If proven successful, the implementation of quartet cards in the PBL model can be recommended for use in science education at other schools, particularly at the elementary level.

METHODS

This study employs a Classroom Action Research (CAR) approach conducted in two cycles. The data sources in this research consist of primary and secondary data. Primary data were obtained directly from fifth-grade students at MI Muhammadiyah 1 Probolinggo in the 2022-2023 academic year through learning outcome tests, observations, and interviews. Additionally, students' interactions during learning activities using quartet cards within the Problem-Based Learning (PBL) model were observed to assess the effectiveness of the applied method. Secondary data include students' academic records before implementing the method, literature related to quartet card learning media, and theories on the PBL model as references for analyzing research findings. The data analysis in this study employs both quantitative and qualitative descriptive analysis techniques. Quantitative analysis is conducted by comparing students' learning outcomes before and after implementing the quartet card media within the PBL model. Test results are analyzed by calculating the average score, percentage of learning mastery, and improvement in learning outcomes from Cycle I to Cycle II. Meanwhile, qualitative analysis is used to describe student engagement in learning based on observation and interview results. Qualitative data are analyzed through data reduction, data presentation, and conclusion drawing. By combining these analyses, this study aims to provide a clear depiction of the effectiveness of quartet card media in enhancing students' learning outcomes through the PBL model.

The findings of this study indicate a significant improvement in students' learning outcomes after implementing the quartet card learning media within the Problem-Based Learning (PBL) model. Before the intervention, the average student score in the pre-cycle was 65, with a mastery level of only 40%. After Cycle I, the average score increased to 75, with the percentage of learning mastery reaching 65%. In Cycle II, the average student score further improved to 85, with a mastery level of 90%.

Additionally, observation results show that student engagement and participation in the learning process also increased. In the pre-cycle, only about 30% of students actively asked questions and participated in discussions. After implementing the PBL method with quartet cards, student engagement rose to 60% in Cycle I and continued to increase to 85% in Cycle II. This demonstrates that problem-based learning supported by interactive media can encourage students to be more involved in the learning process.

To illustrate the research results, the following table presents the improvement in students' learning outcomes across each cycle:

Cycle	Average Score	Learning Mastery (%)	Active Student Participation (%)
Pre-Cycle	65	40%	30%
Cycle I	75	65%	60%
Cycle II	85	90%	85%

From the table above, it is evident that students' average scores and learning mastery levels gradually improved from the pre-cycle to Cycle II. This increase suggests that the use of quartet cards in the PBL model contributes to enhancing students' conceptual understanding of animal and human locomotor organs.

Findings from student interviews also confirm that they enjoyed learning with quartet cards more than conventional lecture-based methods. They stated that the lessons became more engaging, less monotonous, and easier to understand because the material was delivered in a game-based format that encouraged peer interaction.

Data Verification

To ensure the accuracy of the research findings, data were verified through data triangulation, which involved comparing results from learning outcome tests, student activity observations, and interviews with both students and teachers. Data analysis results indicate that the observed improvement in learning outcomes was not merely coincidental but rather the result of implementing a more interactive and participatory learning method. Teachers also noted that learning became more effective as students grasped concepts more

quickly through the quartet card game compared to merely reading textbooks. Moreover, teachers observed that students were more motivated to learn due to the competitive nature of the quartet card game. They were driven to understand the material thoroughly to succeed in the game, which ultimately contributed to their improved learning outcomes.

These findings align with research by Pratama et al. (2022), which states that the use of interactive media in science learning can enhance students' comprehension and make learning more enjoyable. Similarly, Nugroho & Wulandari (2021) found that the implementation of the PBL model improves students' critical thinking and problem-solving skills in elementary science education. This study demonstrates that the combination of the PBL model and quartet card media can effectively enhance students' learning outcomes, both in terms of academic performance and classroom engagement. Thus, this method can be considered an effective learning strategy to improve students' understanding of science concepts.

Based on these findings, it can be concluded that the use of quartet card media within the PBL model has proven effective in enhancing the learning outcomes of fifth-grade students at MI Muhammadiyah 1 Probolinggo. Not only did it improve academic scores, but it also increased active participation, learning motivation, and students' critical thinking and problem-solving skills. This success indicates that the method can serve as an innovative alternative for teachers, particularly in elementary science education. Therefore, it is hoped that the results of this study can serve as a reference for teachers and educational institutions to further develop problem-based learning methods that are more engaging and effective for students.

Additionally, this research highlights the importance of utilizing creative and innovative learning media to enhance learning effectiveness. Teachers are encouraged to continuously explore various instructional strategies and learning media that align with students' characteristics to optimize their learning outcomes.

CONCLUSION

Based on the research findings, it can be concluded that the implementation of quartet card learning media through the Problem-Based Learning (PBL) model significantly enhances the learning outcomes of fifth-grade students at MI Muhammadiyah 1 Probolinggo on the topic of animal and human locomotor organs. The strong findings of this study indicate an increase in students' average scores from 65 in the pre-cycle to 75 in Cycle I, ultimately reaching 85 in Cycle II, with the percentage of learning mastery rising from 40% to 90%. Additionally, student engagement in the learning process also showed a significant improvement, with active participation in discussions and problem-solving increasing from

30% in the pre-cycle to 85% in Cycle II. From an academic perspective, this method has been proven to enhance conceptual understanding, critical thinking skills, and students' problem-solving abilities. The observed increase in participation and learning motivation suggests that interactive and game-based learning activities foster a more engaging and effective learning experience. These findings align with the research by Pratama et al. (2022), which demonstrated that interactive media in science learning improves students' comprehension, as well as the study by Nugroho & Wulandari (2021), which confirmed that the PBL model enhances students' critical thinking skills. From a social contribution perspective, this method positively impacts student interaction and collaboration. Through the quartet card game within the PBL model, students are encouraged to engage in discussions, present arguments, and work together to find solutions, thereby fostering their social skills. As a result, learning is not only focused on academic achievement but also on developing essential collaboration and communication skills for their social lives. The success of this study highlights that innovative and interactive learning media, such as quartet cards within the PBL model, can serve as an effective teaching strategy for educators. Therefore, teachers and educational institutions are encouraged to continue exploring engaging problem-based learning methods, including the integration of digital technology to enhance broader student engagement. Additionally, further research can be conducted to test the effectiveness of this method in other learning subjects and at higher educational levels to ensure its broader impact in the field of education.

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