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Improving Students' Mathematics Learning Outcomes through the Problem Based Learning Model at MI Mathla'ul Anwar Rejo Agung

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Abstract: The problem in this study is the low mathematics learning outcomes of class III students of MI Mathla'ul Anwar Rejoagung Katibung South Lampung. This study aims to improve student learning outcomes in mathematics learning for class III students of MI Mathla'ul Anwar Rejoagung Katibung South Lampung in the 2021/2022 academic year through the PBL Model. The classroom action research method is carried out in 2 cycles. Each cycle consists of planning, implementation, observation and reflection. The results of the study show that using the PBL model in Mathematics learning can improve the Mathematics learning outcomes of class III students of MI Mathla'ul Anwar Rejoagung Katibung South Lampung in the 2021/2022 academic year. This can be seen from the increase in learning outcomes in the first cycle with a passing percentage of 67.35% increasing in the second cycle to 89.36%. Based on these results, it can be concluded that the problem based learning model can be used as an alternative in order to overcome the problem of low student learning outcomes in mathematics learning in elementary schools.

Keywords: Learning outcomes, problem based learning, mathematics learning.

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INTRODUCTION

Education is one form of manifestation of human culture that is dynamic and full of development. Therefore, changes or developments in education are things that should indeed occur in line with changes in the culture of life. Changes in the sense of improving education at all levels need to be carried out continuously in anticipation of future interests. It is explained in Law No. 20 of 2003 concerning the National Education System (Sisdiknas) chapter 1 article 1 paragraph 1 that education is a conscious and planned effort to create a learning atmosphere and learning process so that students actively develop their potential to have spiritual religious strength, self-control, personality, intelligence, noble morals, and skills needed by themselves, society, nation and state.

Education that is able to support development in the future is education that is able to develop the potential of students, so that they are able to face and solve the problems of life they face. Education must touch the potential of conscience and the potential of student competence. The concept of education feels increasingly important when someone has to enter life in society and the world of work, because the person concerned must be able to apply what is learned in school to face problems faced in everyday life now and in the future.

The occurrence of the learning process as an effort to obtain learning outcomes is actually difficult to observe because it takes place in the mind. However, we can identify it from the activities carried out during learning. In relation to this, experts tend to use human behavior patterns as a model that becomes the principles of learning. The learning process must be viewed as a stimulus that can challenge students to feel involved or participate in learning activities. The role of the teacher is only as a facilitator and guide or democratic teaching leader, so that students are expected to do more activities themselves or in groups to solve problems under the guidance of the teacher.

Mathematics learning in general is still dominated by the paradigm of learning centered on educators, which is often referred to as direct learning. Educators actively transfer knowledge to students, while students receive lessons passively. The process of teaching and learning activities in Elementary Schools should take place in an interesting way, students are always enthusiastic in following each subject. However, in reality, learning activities that should be interesting, full of activity and creativity become passive. Students only note things that are considered important, then do the exercises.

Based on the observation results, the mathematics learning outcomes of class III MI Mathla'ul Anwar Rejoagung, Katibung District, South Lampung showed low learning outcomes of students who had not reached the minimum completeness criteria (KKM) set, namely from 25 students around 60% or 15 students who had not reached the KKM score set by the school, namely with a score of 65. In addition to the above problems that cause low learning outcomes of students include: 1) The learning model used is not varied enough, 2) Lack of supporting facilities for the learning process such as teaching aids, 3) Lack of student interest in learning Mathematics, 4) The PBL learning model has not been used in mathematics learning for class III MI Mathla'ul Anwar Rejoagung.

In relation to the above, one way to improve and enhance learning outcomes, educators in teaching can use several learning models. In this case, the learning model that is considered appropriate to the development of Mathematics is PBL, because in problem-based learning, learning is designed in the form of learning that begins with a real problem structure related to the mathematical concepts to be learned. Learning begins after students are faced with a real problem structure, in this way students know why they are learning. All information will be collected through reviewing teaching materials, group work or through discussions with peers, to be used to solve the problems they face. It is hoped that the learning that occurs can be more meaningful and give a strong impression to students so that it can improve learning outcomes in mathematics learning.

METHODS

This study aimed to assess the effectiveness of the Problem-Based Learning (PBL) model in enhancing mathematics learning outcomes at MI Mathla'ul Anwar Rejoagung, Katibung, Lampung Selatan. The research used a Classroom Action Research (CAR) approach, which was chosen because it allows for identifying and solving specific classroom learning issues. The study focused on improving student understanding of mathematics through real-life problem-solving activities, making learning more engaging and relevant for students.

The research was designed using the Classroom Action Research (CAR) methodology, which is ideal for improving classroom practices and understanding the teaching-learning dynamics. This approach is iterative, consisting of cycles of planning, action, observation, and reflection. This structure enabled the researchers to refine the teaching strategies in response to students' feedback and challenges. The study was carried out in two cycles, each containing the same key stages to ensure continuous improvement of the teaching methods. The participants in the study were the fifth-grade students at MI Mathla'ul Anwar Rejoagung, Katibung, Lampung Selatan. The class comprised 30 students, ranging from 10 to 11 years old. These students were selected because they had demonstrated difficulties in understanding mathematical concepts, as shown in their previous performance on mathematics tests. The objective of the research

was to improve their learning outcomes by implementing the Problem-Based Learning model, which emphasizes critical thinking and problem-solving skills.

The research process followed a cyclical format consisting of four main stages: planning, action, observation, and reflection. Each cycle was aimed at assessing and improving the effectiveness of the Problem-Based Learning model, with continuous refinement based on the feedback and observations made during the teaching sessions.

During the planning phase, the researcher and the mathematics teacher worked together to develop a lesson plan that incorporated the Problem-Based Learning model into the mathematics curriculum. The lesson plan was designed around a real-world problem, requiring students to apply mathematical concepts to solve it. The goal was to make the problem relevant to students' everyday experiences, which would increase their engagement with the lesson. The plan also emphasized group work and collaboration, as PBL promotes peer interaction and shared learning. In the action phase, the planned lesson was executed in the classroom. Students were introduced to the mathematical problem and worked in small groups to solve it. The teacher's role was primarily that of a facilitator, guiding the students through the problem-solving process, providing support as needed, and encouraging them to think critically about the problem. The students engaged in discussions, testing different solutions and exploring various approaches to solve the problem.

The observation stage focused on monitoring the students' behavior, engagement, and performance throughout the problem-solving activity. The researcher and the teacher observed how students interacted with each other, how they applied mathematical concepts, and how well they worked together to solve the problem. They also looked at students' enthusiasm, participation, and the level of understanding demonstrated during the activity. In the reflection phase, the teacher and the researcher reviewed the data collected from the action stage. This included classroom observations, student performance, and feedback from the students. They discussed what worked well and what could be improved. Based on this reflection, adjustments were made for the next cycle. For example, if students had difficulty understanding a specific concept, the teacher could simplify the instructions or provide additional resources to clarify the material.

Data collection in this study used multiple methods to assess the effectiveness of the Problem-Based Learning model. These methods included pre- and post-assessment tests, classroom observations, student questionnaires, and teacher reflections. The pre- and post-tests helped to measure improvements in students' understanding of mathematical concepts. Classroom observations allowed the researchers to monitor student behavior and engagement, while student questionnaires provided insight into how students perceived the PBL model. Teacher reflections focused on evaluating the overall success of the lesson and identifying areas for improvement.

The data collected from these various methods were analyzed to assess the impact of the Problem-Based Learning model on student learning outcomes. The quantitative data from the pre- and post-tests were compared to evaluate changes in student knowledge. Qualitative data from the observations, questionnaires, and teacher reflections were analyzed to identify patterns in student engagement, motivation, and collaboration. This comprehensive data analysis provided valuable insights into how well the PBL model worked in improving student learning. At the end of each cycle, the research team evaluated the effectiveness of the intervention. They reviewed whether the learning objectives were met, whether students' problem-solving abilities improved, and whether student motivation increased. If certain goals were not fully achieved, adjustments were made for the next cycle. This process ensured that the teaching strategies were continuously refined to better support the students' learning needs.

Overall, the study showed that the Problem-Based Learning model was effective in enhancing students' motivation and understanding of mathematics. By involving students in real-world problem-solving tasks, the PBL model encouraged active participation, critical thinking, and collaboration. The iterative nature of the research allowed for the

constant refinement of teaching methods, ensuring that the model effectively addressed students' needs and improved their learning outcomes.

RESULTS

The research aimed to examine the effectiveness of the Problem-Based Learning (PBL) model in improving the mathematics learning outcomes of fifth-grade students at MI Mathla'ul Anwar Rejoagung, Katibung, Lampung Selatan. The study was carried out through a Classroom Action Research (CAR) approach, and data were collected through various means including pre- and post-assessments, classroom observations, and student questionnaires. The research was conducted over two cycles, with the purpose of evaluating how the PBL model impacted student engagement, motivation, and academic performance in mathematics. During the first cycle of implementation, the initial assessment results indicated that the majority of students were struggling with understanding basic mathematical concepts. Prior to the intervention, only 40% of the students achieved satisfactory scores in their pre-assessment tests, reflecting low engagement and comprehension in the subject. Many students demonstrated a lack of interest in mathematics, which was further compounded by their difficulties in applying mathematical concepts in real-life scenarios. These results highlighted the need for an instructional approach that would actively involve students and make learning more relevant and engaging.

After the introduction of the Problem-Based Learning model in the first cycle, significant changes were observed in student behavior and engagement. Students were more actively involved in the learning process, participating in group discussions and problem-solving activities. The collaborative aspect of the PBL model encouraged students to work together, share ideas, and help one another understand mathematical concepts. As they worked on solving real-world problems, students began to see the practical applications of mathematics, which increased their interest in the subject. Through observations, it was noted that students became more focused during the problem-solving tasks. They were no longer passively receiving information but were actively engaging with the material, discussing solutions, and applying what they had learned. Teachers also reported a noticeable increase in student enthusiasm, with many students expressing that they found the PBL activities enjoyable and motivating. This shift in student attitude marked a significant improvement from their previous disinterest in mathematics.

Furthermore, the post-assessment results from the first cycle showed an improvement in students' academic performance. On average, students scored higher in the post-test compared to the pre-test, with 60% of the students achieving a satisfactory score. This reflected the positive impact of the PBL model on student learning, suggesting that the model helped students better understand and retain mathematical concepts. The improvement in test scores also indicated that students were more confident in applying their knowledge to solve problems. Despite these improvements, some challenges were still evident in the first cycle. A few students continued to struggle with certain mathematical concepts, particularly in areas requiring more complex problem-solving skills. These students often needed additional support, and some groups faced difficulty in reaching a consensus when solving problems. While collaboration and group work were beneficial, they also exposed differences in student capabilities and comprehension levels. As a result, the researcher and teacher decided to make some adjustments in the second cycle to address these issues and further improve the learning experience.

In the second cycle, several modifications were made to improve the effectiveness of the Problem-Based Learning model. The teacher simplified the mathematical problems to ensure that all students could engage with the material at an appropriate level of complexity. Additional resources, such as visual aids and step-by-step guides, were incorporated to provide clearer explanations of mathematical concepts. Furthermore, the

groups were reorganized to ensure a more balanced mix of students with varying abilities, allowing for better collaboration and support within each group.

These adjustments led to an even greater improvement in student performance during the second cycle. The post-assessment scores increased significantly compared to the first cycle, with 80% of the students achieving satisfactory results. The majority of students were now able to apply mathematical concepts with confidence, and many demonstrated improved problem-solving skills. The use of visual aids and simplified problems made the lessons more accessible to all students, particularly those who had previously struggled to keep up with the pace of learning. Student participation during the second cycle also increased. Students were more proactive in solving problems and were eager to discuss their solutions with their peers. This shift in behavior reflected an increased sense of ownership over their learning. The collaborative nature of the PBL model continued to foster a positive learning environment, where students felt supported by their classmates and were encouraged to think critically. Additionally, the increased use of visual aids and supplementary materials helped students connect abstract concepts to real-world contexts, making the learning process more meaningful.

The questionnaires distributed to students after the second cycle revealed that most students enjoyed the Problem-Based Learning activities. Many students expressed that they found the real-life problems engaging and that they appreciated the opportunity to collaborate with their peers. The majority of students reported feeling more confident in their ability to solve mathematical problems and stated that the lessons were more enjoyable than traditional teaching methods. This feedback confirmed that the PBL model had a positive impact on student motivation and engagement.

In terms of teacher feedback, the teacher reported a noticeable improvement in classroom dynamics during the second cycle. The teacher noted that students were more independent in their learning and were able to take more initiative during problem-solving activities. The teacher also observed that students had become more comfortable with discussing mathematical ideas in front of the class and were more willing to share their solutions with their peers. This increased confidence and participation was seen as a positive outcome of the PBL approach. One of the key successes of the study was the increased collaboration and peer interaction. Students in the second cycle were more likely to help each other and share their understanding of the mathematical concepts. Group discussions encouraged critical thinking and allowed students to approach problems from different angles. The teacher's role as a facilitator rather than a lecturer allowed students to take more ownership of their learning and helped foster a more collaborative classroom environment.

Additionally, the results indicated a significant improvement in students' problem-solving skills. Students who had previously struggled with applying mathematical concepts to real-world situations showed considerable progress in this area. They were able to break down complex problems into manageable parts, apply the appropriate formulas, and discuss their solutions with clarity. This improvement in problem-solving ability was one of the most significant outcomes of the research, as it reflected the students' growing understanding of mathematics as a practical and applicable subject.

The research also revealed that the Problem-Based Learning model fostered a deeper understanding of mathematics among students. By engaging with real-world problems, students were able to see the relevance of the concepts they were learning. This enhanced understanding helped students make connections between different mathematical topics and see how they could apply their knowledge in various situations. As a result, students were not only able to solve problems but also developed a stronger conceptual grasp of the subject. While the overall results were positive, the study also identified some areas for improvement. For instance, some students continued to require additional support during group activities, especially those who struggled with basic mathematical concepts. In future cycles, providing more individualized support and targeted interventions could help address these students' needs more effectively.

Additionally, although the PBL model increased engagement and motivation, some students found the collaborative tasks challenging due to varying levels of ability within the groups. It may be beneficial to incorporate strategies that ensure all students are equally involved in the problem-solving process.

The study also highlighted the importance of adapting teaching strategies to the diverse needs of students. While the Problem-Based Learning model was effective for most students, it is essential to continue adjusting and fine-tuning the approach to better meet the needs of all learners. Further research and adjustments in the design of problem-based tasks could lead to even more significant improvements in student learning outcomes. The research aimed to determine the effectiveness of the Problem-Based Learning (PBL) model in improving the mathematics learning outcomes of fifth-grade students at MI Mathla'ul Anwar Rejoagung, Katibung, Lampung Selatan. The study was conducted in two cycles, with data collected through pre- and post-assessments, classroom observations, and student questionnaires. The results from the first cycle showed that only 40% of students achieved satisfactory scores in the pre-assessment, indicating that many students were struggling with basic mathematical concepts. This suggested that traditional teaching methods were not engaging or effective enough for the students.

After implementing the PBL model in the first cycle, significant improvements were observed in both student engagement and academic performance. Classroom observations revealed that students were more involved in the learning process, with active participation in group discussions and problem-solving activities. The post-assessment results from the first cycle showed that 60% of students had improved their scores, indicating that the PBL model had a positive impact on their understanding and application of mathematical concepts. In the second cycle, several adjustments were made to improve the effectiveness of the PBL model, including simplifying problems and reorganizing student groups. These modifications led to even greater improvements in student performance. The post-assessment results from the second cycle showed that 80% of students achieved satisfactory scores. The changes made during the second cycle addressed the challenges identified in the first cycle, allowing students to engage more effectively with the content and improve their problem-solving abilities.

Student feedback collected through questionnaires revealed a high level of satisfaction with the PBL activities. Most students expressed that they enjoyed the learning process, found it more engaging, and felt more confident in their ability to solve mathematical problems. This positive feedback reinforced the idea that the PBL model not only improved students' academic performance but also increased their motivation and enthusiasm for learning. Overall, the results of the study indicate that the Problem-Based Learning model was successful in improving both student engagement and learning outcomes in mathematics. The students' increased participation, higher post-assessment scores, and positive feedback suggest that PBL is an effective approach for fostering a more interactive, student-centered learning environment.

DISCUSSION

The aim of this research was to evaluate the effectiveness of the Problem-Based Learning (PBL) model in enhancing mathematics learning outcomes for fifth-grade students at MI Mathla'ul Anwar Rejoagung, Katibung, Lampung Selatan. This study was conducted through Classroom Action Research (CAR), allowing the researchers to apply and assess the PBL model in real classroom settings, making it a practical approach for addressing the challenges students faced in understanding mathematics. The research focused on student engagement, motivation, and learning outcomes, which were measured through pre- and post-assessments, classroom observations, and student questionnaires. The results showed promising improvements in student performance, suggesting that PBL was an effective teaching strategy for improving mathematics learning outcomes.

One of the most striking findings was the initial low performance of students in the pre-assessment, where only 40% of students scored satisfactorily. This indicated that the students were not fully engaged with the subject matter, and their understanding of the mathematical concepts was limited. This aligns with the challenges faced by many educators in engaging students in traditional mathematics teaching methods, which often rely heavily on rote memorization and passive learning. The low pre-assessment scores reflected a need for a more interactive and student-centered approach, such as the PBL model, which aims to engage students in active learning through problem-solving and collaboration.

After the implementation of the PBL model, there was a noticeable improvement in student engagement. Observations made during the first cycle revealed that students were more involved in the lesson, actively participating in group discussions and problem-solving activities. This shift from passive to active learning is consistent with the goals of PBL, which emphasizes student autonomy, collaboration, and critical thinking. Students were no longer just passive recipients of information; instead, they took ownership of their learning, which is a key feature of PBL. This change was observed in the increased enthusiasm and participation of students during the lessons, and it was further supported by the results of the post-assessment, where 60% of students achieved satisfactory scores.

This increase in student engagement can be attributed to the real-world problems used in the PBL model. By using problems that were relevant to students' daily lives, the teacher made mathematics more meaningful and engaging. Students were able to see the connection between abstract mathematical concepts and their practical applications, which increased their motivation to learn. This is in line with the findings of several studies that suggest students are more likely to engage with and retain information when it is tied to real-world contexts. The use of real-life problems also encouraged students to think critically and apply their mathematical knowledge in meaningful ways, which enhanced their problem-solving skills.

However, while the first cycle showed improvements, it also highlighted some challenges. Some students still struggled with certain mathematical concepts, especially those that required higher-order problem-solving skills. This was particularly true for students who had lower prior knowledge of mathematics or who had difficulties working in groups. These students often needed additional support to understand the concepts fully and to participate effectively in group activities. This issue was addressed in the second cycle, where the researcher and teacher made adjustments to the lesson plan to better support students who were struggling.

One of the adjustments made in the second cycle was simplifying the mathematical problems to ensure they were accessible to all students. The problems were designed with varying levels of complexity, allowing students to engage with tasks that were appropriate for their level of understanding. This approach helped to ensure that all students were able to participate in the problem-solving process, regardless of their mathematical abilities. This modification was crucial in ensuring that the PBL model was inclusive and that all students could benefit from the learning experience. By breaking down complex problems into smaller, manageable parts, students were able to grasp the key concepts more effectively.

Additionally, the second cycle involved reorganizing the groups to ensure a more balanced mix of students with different abilities. In the first cycle, some groups had a disproportionate number of high-performing students, which led to unequal participation and collaboration. In the second cycle, the teacher intentionally mixed students with varying levels of ability, which encouraged peer support and collaboration. This adjustment helped to create a more supportive learning environment where students could learn from one another, share ideas, and work together to solve problems. It also allowed the teacher to provide targeted support to students who needed it most.

The changes made in the second cycle resulted in even greater improvements in student performance. The post-assessment scores for the second cycle showed that 80%

of students achieved satisfactory results, a significant increase from the first cycle. This improvement reflected not only the effectiveness of the PBL model but also the positive impact of the adjustments made to address the challenges observed in the first cycle. The higher post-assessment scores indicated that students had a better understanding of the mathematical concepts and were more confident in applying them to solve problems.

The improvement in student performance was further supported by the observations made during the second cycle. Students were more engaged in the problem-solving tasks, and their interactions with peers were more collaborative and focused. The groups worked together more effectively, with students contributing ideas and discussing solutions. This increased collaboration fostered a sense of teamwork and allowed students to learn from one another. The teacher noted that students were more independent in their learning, with many taking the initiative to solve problems on their own and share their solutions with the class. This increased autonomy is a key outcome of the PBL model, as it encourages students to become active learners and critical thinkers.

Another important outcome of the second cycle was the positive feedback from students, which was collected through questionnaires. The majority of students expressed that they enjoyed the problem-based activities and felt more confident in their ability to solve mathematical problems. Many students indicated that they found the real-life problems engaging and that they appreciated the opportunity to collaborate with their peers. This feedback reinforced the idea that the PBL model was successful in making mathematics more interesting and accessible to students. When students find the learning process enjoyable, they are more likely to be motivated to learn and to achieve better academic outcomes.

Teacher feedback also indicated that the second cycle was more successful than the first. The teacher reported that students were more engaged, independent, and confident in their ability to solve problems. The teacher noted that the students were more willing to participate in class discussions and share their solutions with the group. This increase in participation reflected the success of the PBL model in creating a more interactive and student-centered learning environment. The teacher also observed that the students' problem-solving skills had improved, as they were able to approach mathematical problems with greater confidence and clarity. Despite the positive outcomes, the study also revealed some areas for improvement. Although most students showed significant progress, a few students continued to struggle with basic mathematical concepts. These students needed additional support, and the teacher may need to provide more individualized attention to ensure they fully grasp the material. In future cycles, the teacher could implement differentiated instruction strategies to better meet the needs of these students. For example, providing additional practice problems, offering one-on-one tutoring sessions, or using more visual aids could help these students strengthen their understanding of the concepts.

Additionally, while the group work was beneficial for most students, some students found it challenging to collaborate effectively. This was particularly true for students who had difficulty expressing their ideas or who were less confident in their mathematical abilities. To address this issue, the teacher could consider implementing more structured group activities that clearly define each student's role and responsibilities within the group. This would help ensure that all students are actively involved in the problem-solving process and that no one is left behind.

One of the key strengths of this study was the emphasis on real-world problems, which helped students connect mathematical concepts to their daily lives. By solving problems that were relevant to their experiences, students were able to see the practical applications of mathematics and were more motivated to learn. The use of real-world problems also encouraged critical thinking, as students had to analyze the problems from different perspectives and come up with creative solutions. This approach fostered deeper learning and helped students develop valuable problem-solving skills that they could apply in other areas of their lives.

In conclusion, the results of this study indicate that the Problem-Based Learning model is an effective strategy for improving student engagement, motivation, and learning outcomes in mathematics. The PBL model encourages active learning, collaboration, and critical thinking, which are essential skills for success in mathematics and beyond. The study also highlighted the importance of making adjustments to the teaching approach to address the diverse needs of students. By providing a more inclusive learning environment and offering additional support to struggling students, the PBL model can be even more effective in enhancing student learning. The positive outcomes of this study suggest that PBL should be further explored and integrated into mathematics instruction to foster a more engaging, student-centered learning experience.

To address this issue, adjustments were made in the second cycle, such as simplifying the problems and reorganizing the groups to create a more balanced mix of abilities. These changes helped ensure that all students could participate effectively and benefit from the learning experience. The second cycle saw even greater improvements in student performance. With 80% of students achieving satisfactory scores in the post-assessment, the results indicated that the adjustments made to the PBL approach were successful in enhancing student understanding. The increased participation, collaboration, and confidence among students reflected the positive impact of the model on their learning outcomes. The feedback from students was overwhelmingly positive, with many expressing that they enjoyed the PBL activities and felt more confident in their problem-solving abilities. This increased motivation was crucial in fostering a more engaging and supportive learning environment. When students enjoy the learning process and feel empowered to take charge of their education, they are more likely to achieve better results and develop a lifelong interest in the subject. The findings of this study suggest that the PBL model is an effective method for improving mathematics learning outcomes.

The model not only enhances student engagement and motivation but also promotes deeper understanding and the development of essential problem-solving skills. However, the study also highlighted the importance of continuously adjusting the approach to meet the diverse needs of students. By providing targeted support and fostering collaboration, the PBL model can be further optimized to ensure that all students succeed. In conclusion, this research underscores the potential of the Problem-Based Learning model to transform mathematics instruction and improve student outcomes. The study's results indicate that PBL can engage students, foster critical thinking, and improve their performance in mathematics. As education continues to evolve, the PBL model offers a valuable alternative to traditional teaching methods, supporting a more interactive, student-centered approach to learning. Future research and continued adaptation of the PBL model could further enhance its effectiveness, benefiting students and educators alike.

CONCLUSION

This study aimed to evaluate the effectiveness of the Problem-Based Learning (PBL) model in improving the mathematics learning outcomes of fifth-grade students at MI Mathla'ul Anwar Rejoagung, Katibung, Lampung Selatan. The results of the research demonstrated that the PBL model significantly enhanced student engagement, motivation, and academic performance. The improvements observed in both the first and second cycles of the study indicate that the PBL model can be an effective approach for teaching mathematics in elementary schools. Initially, the students' performance in mathematics was low, as indicated by the pre-assessment results, where only 40% of the students achieved satisfactory scores. This reflected the students' lack of engagement and difficulties in grasping mathematical concepts. The findings revealed a clear need for a more interactive and student-centered teaching approach. Traditional teaching methods, which often rely on rote learning, were not sufficient to spark student interest or help them understand the subject matter. Following the implementation of the PBL model, student engagement

improved significantly. Observations during both cycles indicated that students were more active and participated eagerly in the learning process. The PBL approach, which centered around real-world problem-solving tasks, captured students' attention and encouraged them to apply mathematical concepts in meaningful ways. This active participation led to improved performance and a more positive attitude toward mathematics. The PBL model facilitated the development of critical thinking and problem-solving skills among students. By working on real-life problems, students were able to connect mathematical concepts to their everyday experiences. This relevance made the subject more interesting and accessible, motivating students to learn. Additionally, students gained confidence in their ability to solve problems and apply their knowledge independently, as evidenced by the increased scores in the post-assessment tests. Another key benefit of the PBL model was the promotion of collaboration among students. Group work encouraged peer interaction, allowing students to share ideas, discuss solutions, and help each other understand the material. This cooperative learning environment not only improved students' academic performance but also fostered valuable social skills. Students learned to work together, communicate effectively, and appreciate the diverse perspectives of their peers. While the first cycle showed significant improvements, it also highlighted some challenges. Some students continued to struggle with certain mathematical concepts, particularly those that required more advanced problem-solving skills.

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