ENHANCING STUDENTS' INTEREST IN LEARNING MATHEMATICS THROUGH THE IMPLEMENTATION OF PROBLEM-BASED LEARNING: A CLASSROOM ACTION RESEARCH

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ABSTRACT

This classroom action research aims to enhance students' interest in learning mathematics through the implementation of the Problem-Based Learning (PBL) model in Class X.6 at SMA PGRI 2 Palembang during the 2024/2025 academic year. The study was conducted in two cycles, each consisting of planning, action, observation, and reflection. The participants comprised 37 students. Data collection involved interviews, observations, questionnaires, field notes, and documentation. The average observation score for student interest increased from 65.28% in the first cycle to 78.73% in the second. Questionnaire data showed a rise from 82.32% to 86.81%. These results indicate that PBL effectively improves students' interest in learning mathematics.

ABSTRAK

Penelitian tindakan kelas ini bertujuan untuk meningkatkan minat belajar peserta didik pada mata pelajaran matematika dengan menerapkan model *Problem Based Learning* (PBL) di kelas X.6 SMA PGRI 2 Palembang Tahun Ajaran 2024/2025. Penelitian tindakan kelas ini terdiri dari dua siklus pembelajaran, yang terdiri dari tahap perencanaan, tindakan, observasi dan refleksi untuk setiap siklusnya. Subjek penelitian ini adalah peserta didik kelas X.6 SMA PGRI 2 Palembang yang berjumlah 37 peserta didik. Teknik pengumpulan data yang digunakan adalah wawancara, observasi, angket, catatan lapangan dan dokumentasi. Hasil penelitian terhadap minat belajar pada siklus 1 berdasarkan hasil observasi mencapai 65,28% dan meningkat menjadi 78,73% pada siklus 2. Adapun, berdasarkan hasil pengisian angket oleh peserta didik diperoleh minat belajar peserta didik mencapai rata-rata persentase mencapai 82,32% dan meningkat menjadi 86,81% pada siklus 2. Berdasarkan hasil penelitian disimpulkan bahwa penerapan *Problem Based Learning* dapat meningkatkan minat belajar peserta didik pada mata pelajaran matematika.

Introduction

Mathematics is a discipline that explores abstract concepts. The abstract nature of mathematical objects often becomes a primary reason why students perceive mathematics as a difficult subject. According to (Aprilia & Fitriana, 2022), mathematics is considered complex and challenging because it consistently involves numbers, formulas, and calculations. This perception creates an initial fear among students, leading them to feel incapable of understanding mathematical concepts. As a result, many students lose interest in mathematics even before attempting to learn it, which negatively affects their motivation and comprehension.

Eliminating the belief that mathematics is difficult must begin with teachers. Teachers play a crucial role in shaping a positive perception of mathematics by implementing innovative and engaging teaching strategies. (Gazali, 2016) suggests that teachers can create meaningful learning experiences by incorporating diverse instructional methods that actively engage students. Applying varied teaching approaches is essential in making mathematics more appealing, as it fosters a more interactive and student-centered learning environment (Friantini & Winata, 2019).

However, in reality, the implementation of mathematics instruction remains suboptimal, necessitating further improvements. (Yuniar et al., 2021) argue that low student interest in mathematics results from difficulties in understanding mathematical concepts and the inability to solve problems despite their efforts to learn (Firdaus, 2019).

This issue is also evident in class X.6 at SMA PGRI 2 Palembang during the 2024/2025 academic year. Based on an interview conducted by the researcher September 4, 2024, with the mathematics teacher, Sri Herawati, S.Pd., it was revealed that only a small number of students in class X.6 showed enthusiasm for mathematics. Most students who demonstrated interest had strong cognitive abilities, whereas others were less engaged. Student responses to the teacher's explanations varied; some paid close attention, others appeared lost in thought, and some were distracted by conversations with peers. Additionally, students lacked the initiative to ask questions when they faced difficulties and were hesitant to answer questions for fear of making mistakes.

Addressing this challenge requires implementing effective teaching strategies that can enhance students' interest in mathematics. One promising approach is the Problem-Based Learning (PBL) model. It is an instructional model that uses real-world problems as a context for students to develop critical thinking and problem-solving skills while acquiring fundamental knowledge and concepts

(Saputro et al., 2024). Implementing PBL in classroom instruction shifts the learning process to a student-centered approach, allowing students to take an active role in their learning experiences (Ariyanti, 2016).

In mathematics education, adopting Problem-Based Learning has been proven to enhance students' interest in learning. This is supported by a study conducted by (Widayat, 2021) indicate that employing Problem-Based Learning significantly increases students' motivation and engagement in mathematics.

Despite existing literature on PBL, few studies have explored its implementation in local cultural contexts. This study addresses this gap by integrating cultural elements into PBL worksheets, thus making learning more relatable. The research investigates how PBL, enriched with contextual problems, can enhance student interest in mathematics in Class X.6 of SMA PGRI 2 Palembang. This study contributes to the field by: (1) demonstrating the effectiveness of PBL in increasing learning interest, (2) providing evidence on the value of integrating local culture into mathematical problems, and (3) offering actionable strategies for teachers.

Method

The research was conducted from September 6 to October 11, 2024, involving 37 students from class X.6 at SMA PGRI 2 Palembang during the 2024/2025 academic year. The participants comprised 18 male and 19 female students. The study took place at SMA PGRI 2 Palembang, located on Jalan Jenderal A. Yani, Lorong Gotong Royong 9/10 Ulu Palembang.

This study employed a Classroom Action Research (CAR) approach, conducted collaboratively with the supervising teacher. The primary objective was to enhance students' interest in learning mathematics through the implementation of Problem-Based Learning (PBL). The data collection process involved conducting interviews, observations, questionnaires, field notes, and documentation.

The Classroom Action Research design followed a structured cycle consisting of four phases:

1. Planning: Developing lesson plans and instructional strategies.
2. Acting: Implementing the Problem-Based Learning approach in the classroom.
3. Observing: Monitoring students' engagement and responses during the learning process.
4. Reflecting: Evaluating the effectiveness of the intervention and identifying areas for improvement.

The research findings were analyzed using both qualitative and quantitative data analysis techniques. Qualitative data obtained from interviews were examined by summarizing responses from participants and presenting them in a descriptive format. Meanwhile, qualitative data derived from observations and interest-based questionnaires were analyzed by calculating the percentage increase in students' learning interest. The interpretation of these data followed the percentage-based approach, providing insights into students' engagement and motivation levels throughout the study. The cycle in this classroom action research is considered successful if the score achieved is at least 75%, indicating that learning interest had reached a satisfactory level.

Results and Discussion

This research was conducted in two learning cycles, each comprising four stages: planning, acting, observation, and reflection. The study aimed to enhance students' interest in learning mathematics through the implementation of Problem-Based Learning (PBL), focusing on the topics of Measures of Data Position, Measures of Data Dispersion, and Probability of Simple Events.

1. 1st Cycle

The planning stage began with preparing instructional materials on Measures of Data Position (Quartiles, Deciles, and Percentiles) for both single and grouped data sets. This stage involved designing a Lesson Plan, developing teaching media in the form of PowerPoint slides, creating Student Worksheets (LKPD), designing assessment tools, preparing observation sheets and student interest questionnaires, as well as organizing notes and documentation sheets.

The acting stage was implemented over two sessions (see Figure 1) on September 12, and 19 2024, with each session allocated 2 x 25 minutes (two instructional hours). During these sessions, the researcher conducted mathematics lessons using the Problem-Based Learning approach. The learning process followed the structured steps outlined in the Lesson Plan, which consisted of three main phases:

1. Introduction: Engaging students and providing context for the lesson.
2. Main Activities: Conducting learning activities based on the syntactic phases of Problem-Based Learning, which emphasize problem-solving and active student participation.
3. Closure: Summarizing key concepts and reflecting on the lesson.

Figure 1. Implementation of learning in 1st cycle

This structured approach was designed to foster active learning engagement and improve students' interest in mathematics. During the action stage, the researcher simultaneously conducted observations on students' activities while participating in mathematics lessons using the PBL approach. The observation results indicated that the average percentage of students' interest in learning mathematics was 65.28%, which falls into the moderate category. In addition to using observation guidelines, the researcher also utilized questionnaires to assess the achievement of learning interest indicators.

Based on students' responses to the questionnaire, the average percentage of interest in learning mathematics reached 82.32%, categorizing it as good. However, some indicators had not yet been fully achieved, indicating the need for further improvements in enhancing students' learning interest.

During the reflection stage, the researcher concluded that the implementation of CAR in 1st Cycle still had several shortcomings that needed improvement. These included low student participation in group discussions, difficulties in understanding the learning material, and a lack of initiative among study groups to present their discussion results in front of the class.

2. 2nd Cycle

The planning stage in 2nd Cycle began with preparing learning materials on Measures of Data Dispersion and Probability of Simple Events. This stage involved designing the Lesson Plan, developing teaching media in the form of PowerPoint slides, and creating Student Worksheets (LKPD) that incorporated contextual problems related to the lesson topics. Additionally, the researcher designed assessment tools, observation sheets, and student interest questionnaires, as well as organized notes and documentation sheets.

The acting stage in 2nd Cycle was conducted over two sessions on October 3, and 10 2024, with each session allocated 2 x 35 minutes (two instructional hours). In these third and fourth sessions, the researcher carried out mathematics lessons using the Problem-Based Learning (PBL) approach combined with

Culturally Responsive Teaching (CRT). The implementation of 2nd Cycle focused on addressing the shortcomings identified during the reflection stage of 1st Cycle.

During the lessons, the researcher integrated local cultural contexts into the learning materials to help students construct new knowledge by relating it to their prior experiences. Cultural integration examples are the LKPD used a "National Park Puntikayu", "The Bidar Racing", and "Tanggai Dance". Additionally, the researcher provided guidance to groups facing difficulties and offered recognition and encouragement to groups that demonstrated the confidence to present their discussion results (see figure 2).

Figure 2. Implementation of learning in 2nd cycle

During the action stage, the researcher simultaneously conducted observations on students' activities while engaging in mathematics lessons using the Problem-Based Learning (PBL) approach. The observation results indicated that the average percentage of students' interest in learning mathematics reached 78.73%, which falls into the good category. In addition to using observation guidelines, the researcher also employed questionnaires to assess the achievement of learning interest indicators. Based on students' responses to the questionnaire, the average percentage of students' interest in learning mathematics increased to 86.81%, also categorized as good.

During the reflection stage, the researcher concluded that the implementation of CAR in 2nd Cycle had significantly improved compared to the previous cycle. Students were more engaged in the learning process, actively listened to the teacher's explanations, confidently answered questions posed by the teacher, and demonstrated the willingness to ask questions when facing difficulties. Additionally, they collaborated effectively to solve problems presented in the Student Worksheets (LKPD).

The research findings indicate a significant increase in students' interest in learning mathematics after the implementation of Problem-Based Learning (PBL). The analysis of the results is discussed as follows:

Based on discussions with the Mathematics Teacher during the pre-research phase, it was found that only a small number of students had a genuine interest in mathematics. Most students tended to dislike the subject due to a lack of mastery of fundamental concepts, which led to a reluctance to engage in learning. During the teacher's explanation of the material, student responses varied; however, many were often distracted, engaging in conversations, and not fully focused on the lesson. This situation highlighted the need for a solution to enhance students' interest in mathematics.

The percentage of students' interest in learning mathematics, as observed in Cycle I, reached 65.28%, which falls into the moderate category. Furthermore, based on interviews conducted with students during 1st Cycle, it was revealed that they struggled with problem-solving tasks due to difficulties in understanding the concepts of quartiles, deciles, and percentiles.

In 2nd Cycle, students' interest in learning mathematics increased to 78.73%, categorizing it as good. Students found it easier to complete the Student Worksheets (LKPD) because the problems presented were contextualized within their local culture, making learning more meaningful and enjoyable (Aceves & Orosco, 2014; Mahfudhoh, A. & Aini, 2022; Samo & Kartasasmita, 2018).

The observational results regarding students' engagement in mathematics lessons through the implementation of Problem-Based Learning are presented in the Figure 3.
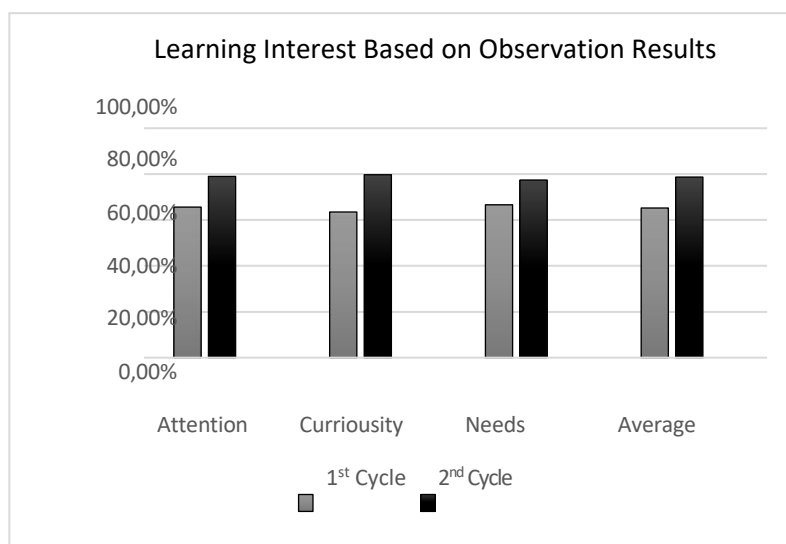

Figure 3. Learning interest result

Based on the results of interviews conducted with students at the end of each cycle regarding the implementation of mathematics learning through Problem-Based Learning, it was found that the students responded positively.

They became more interested in learning mathematics through solving contextual problems related to the subject matter presented in the student worksheets (LKPD) and ethno mathematics articles (Rahmah et al., 2023). The students found it easier to understand the material by connecting it to real-life situations around them. They also felt happy because the teacher gave praise to the best-performing groups.

Conclusion

The Classroom Action Research was conducted in Class X.6 of SMA PGRI 2 Palembang in the 2024/2025 academic year, focusing on students' interest in learning mathematics through the implementation of Problem-Based Learning. The research results indicated an increase in students' interest in learning mathematics after the application of Problem-Based Learning. This study contributes to the literature by demonstrating how PBL can be adapted to local contexts. The findings suggest that embedding cultural elements in mathematics learning enhances relevance and motivation.

In relation to the challenges encountered by the researcher in implementing Problem-Based Learning to enhance students' learning interest, the following recommendations are proposed: a) Teachers should contextualize mathematical problems using students' daily lives and local culture; b) The application of Problem-Based Learning in mathematics instruction plays a significant role in increasing students' learning interest; therefore, teachers need to pay close attention to the detailed steps of the learning process in accordance with the syntax of the Problem-Based Learning model being implemented; c) During the learning process, providing appreciation, even in the form of simple praise or applause, can enhance students' interest in learning.

Declarations

Author contribution. SMR and A designed the PBL model in the Teaching Module, Student Worksheet (LKPD), and research instruments. SMR conducted teaching for two cycles, while A coordinated the observation of the learning process. Both SMR and A collected and analyzed the data.

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