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# Improving Student's Vocabulary Mastery by Using Problem-Based Learning in Narrative Text

## *(Meningkatkan Penguasaan Kosakata Siswa dengan Menggunakan Pembelajaran Berbasis Masalah dalam Teks Naratif)*

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**Abstract**

This study employs a quantitative method with a pre-experimental design, specifically the one-group pre-test and post-test. The sample of the study consists of IX.1 class students at SMP Muhammadiyah Tilango, selected due to their low vocabulary skills based on interviews with teachers and researchers. The research aims to analyze the effect of problem-based learning on improving students' vocabulary in narrative texts. Data were collected through vocabulary tests administered before and after the intervention. In addition, observations were conducted from the first to the fourth meeting to assess the effectiveness of the method. The results show a significant improvement in the vocabulary skills of the experimental class compared to the control class, which did not receive any treatment. Data analysis using the t-test reveals that the calculated t-value of 4.108 is greater than the t-table value of 2.119, leading to the acceptance of the alternative hypothesis (Ha) and the rejection of the null hypothesis (Ho). Thus, it can be concluded that problem-based learning effectively improves students' vocabulary skills. This study implies that the problem-based learning method can be implemented as an effective approach to enhance vocabulary learning in secondary schools.

**Abstrak**

*Penelitian ini menggunakan metode kuantitatif dengan desain pra-eksperimental one group pre-test and post-test. Sampel penelitian adalah siswa kelas IX.1 di SMP Muhammadiyah Tilango, yang dipilih karena memiliki kemampuan kosakata yang rendah berdasarkan wawancara dengan guru dan peneliti. Penelitian ini bertujuan untuk menganalisis pengaruh pembelajaran berbasis masalah terhadap peningkatan kosakata siswa dalam teks naratif. Data dikumpulkan melalui tes kosakata yang diberikan sebelum dan sesudah intervensi. Selain itu, observasi juga dilakukan dari pertemuan I hingga IV untuk melihat efektivitas penerapan metode tersebut. Hasil penelitian menunjukkan bahwa terdapat peningkatan signifikan dalam kemampuan kosakata siswa di kelas eksperimen dibandingkan dengan kelas kontrol, yang tidak menerima perlakuan. Analisis data menggunakan uji t menunjukkan nilai t hitung 4,108 lebih besar dari t tabel 2,119, sehingga hipotesis alternatif (Ha) diterima, dan hipotesis nol (Ho) ditolak. Dengan demikian, dapat disimpulkan bahwa pembelajaran berbasis masalah secara efektif meningkatkan kemampuan kosakata siswa. Penelitian ini memberikan implikasi bahwa penggunaan metode pembelajaran berbasis masalah dapat diterapkan sebagai pendekatan yang efektif untuk meningkatkan pembelajaran kosakata di sekolah menengah.*

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## 1. INTRODUCTION

Vocabulary is an essential component of language, playing a crucial role in interpersonal interactions. It consists of the collection of words that individuals use to construct sentences, enabling smooth communication in daily life. Effective communication can occur through various languages, including English. Yudha and Mandasari (2021) emphasize the significance of vocabulary in language teaching and learning, noting that understanding new words, particularly those encountered in books or classrooms, is vital for mastering English. A robust vocabulary aids students in utilizing language correctly and effectively, which in turn enhances their ability to communicate clearly (Chung, 2023). However, many students face challenges in comprehending spoken language, often struggling to understand new vocabulary they encounter, which hampers their overall communication skills (Aziz & Kashinathan, 2021).

Problem-Based Learning (PBL), conceived in the late 1970s, presents a student-centered approach that engages learners by challenging them to solve real-world problems (Senyah, 2024). This pedagogical method shifts the focus from traditional teaching to an active learning process where students take the initiative in their learning journey (Sukackė et al., 2022). By integrating real problems into the learning context, PBL not only enhances students' motivation but also facilitates the development of critical thinking and problem-solving skills. Ghani et al. (2021) describe PBL as a learning model that utilizes authentic challenges as a framework for students to gain essential knowledge and concepts. According to Tang et al. (2020), PBL fosters an environment where students collaborate in groups to explore solutions, sparking curiosity and deepening engagement with the material. Burgess et al. (2020) further reinforce this notion by highlighting that PBL encourages learners to participate actively in group discussions, fostering an environment conducive to inquiry and investigation.

The researcher has selected PBL for this study because it addresses the pressing issue of vocabulary acquisition in narrative texts. By leveraging real-world problems related to vocabulary, PBL has the potential to enhance students' understanding and usage of language (Pangaribuan, 2022). Overall, Problem-Based Learning serves as a dynamic approach that not only focuses on vocabulary development but also cultivates critical thinking and problem-solving skills, essential for students' academic success.

Like any educational model, Problem-Based Learning has its advantages and challenges in classroom application. Cai (2022) outlines several benefits, noting that students become accustomed to problem-posing and are motivated to tackle challenges, which extends beyond the classroom to real-life scenarios. This process promotes social solidarity, as students engage in discussions within their groups and with peers, fostering a collaborative learning environment (Ghavifekr, 2020). Furthermore, the PBL framework encourages students to conduct experiments, enhancing their practical skills and experiential learning (Maynard et al., 2021). However, the model is not without its drawbacks. Many teachers lack the training to effectively guide students through problem-solving processes, and the implementation of PBL can be resource-intensive and time-consuming (Rehman, 2023). Additionally, monitoring student activities outside the classroom can pose significant challenges.

Narrative texts were specifically chosen for this research due to their accessibility and relevance to students, which can stimulate their interest and motivation to expand their vocabulary. Narrative texts recount events in a structured chronological order, often featuring imaginary or fictional elements. The narratives utilized in this study align with K.D 3.3 and K.D 4.3 curricular guidelines, making them suitable for the educational context. These texts serve as a valuable resource for students, offering a personal dictionary that helps them grasp word meanings and sentence structures simultaneously. However, students often face challenges in communication, as they may lack the motivation to memorize vocabulary without understanding pronunciation or usage (Amoah & Yeboah, 2021).

Interviews with English teachers at Muhammadiyah Tilango Middle School, along with assessments of ninth-grade students, revealed that the average vocabulary comprehension scores were below the KKM threshold. This was particularly evident in students' understanding of adjectives, verbs, and nouns found in narrative texts. The selection of SMP Muhammadiyah for this study is justified by its large student population, adequate facilities, and alignment with the curriculum used in public schools. This context

provides a rich environment to explore the effectiveness of PBL in enhancing vocabulary comprehension among students.

The novelty of this study lies in the application of Problem-Based Learning (PBL) specifically to enhance students' vocabulary in the context of narrative texts. While PBL has been widely recognized for improving critical thinking and problem-solving skills, its direct impact on vocabulary acquisition—especially in the context of narrative texts in a middle school setting—remains under-researched. Previous studies have predominantly focused on vocabulary improvement through conventional methods such as rote memorization and repetition. However, this research innovatively examines how PBL, with its focus on real-world problem-solving and active student engagement, can provide a more effective and engaging approach to vocabulary development. This study also fills a gap by focusing on narrative texts, which are often used in classrooms but seldom explored in terms of their potential for enriching vocabulary. Therefore, this research not only contributes to the field of language teaching but also offers a fresh perspective on using PBL to tackle vocabulary challenges in secondary education.

## 2. RESEARCH METHODS

This research is categorized as quantitative research using a quasi-experimental method. The study is divided into two groups: one experimental class and one control class. The experimental class received treatment using Problem-Based Learning (PBL), while the control class did not receive any specific treatment.

The study employed a pre-experimental design, specifically the one-group pre-test and post-test design. According to Sugiyono (2014), a pre-experimental design involves a single group that undergoes both pre-testing and post-testing. The students were initially given a pre-test, followed by a treatment, and finally, a post-test to assess the effectiveness of the intervention. The research design is illustrated as follows:

1. O1 X O2
2. O1 = Pre-test
3. X = Treatment
4. O2 = Post-test

### 2.1 Pre-test

The pre-test is conducted as the first step before the treatment. The researcher provided a narrative text to assess the students' prior vocabulary knowledge before introducing the PBL method. The pre-test consisted of three questions based on the narrative text, designed to evaluate students' understanding of vocabulary related to the text. This initial test was used to measure the students' baseline vocabulary knowledge.

### 2.2 Treatment

The treatment was conducted over six meetings, where the researcher created an engaging and supportive classroom environment. The narrative texts selected for each meeting were chosen to stimulate student interest and encourage vocabulary development:

1. First meeting: "Sangkuriang"
2. Second meeting: "A Hungry Crocodile"
3. Third meeting: "Sura and Baya"
4. Fourth meeting: "Fox and Cat"

During the treatment, the Problem-Based Learning (PBL) method was implemented in the following steps:

1. The researcher distributed a narrative text (e.g., "Lake Toba") and allowed students 10 minutes to read the story.
2. The researcher oriented the students to the problem by identifying three key vocabulary words in the narrative text that the students needed to understand and solve.
3. The class was divided into five groups, and each group was tasked with solving vocabulary-related problems based on the narrative text.
4. The researcher guided the groups in collecting data and finding solutions related to the vocabulary challenges.
5. One group was asked to present their work, and the other groups were encouraged to provide feedback.
6. After all groups had presented, the researcher provided reinforcement of the vocabulary concepts and problem-solving strategies.
7. The treatment concluded with an evaluation of the students' solutions, followed by a reflection session.

The same PBL steps were repeated for subsequent meetings with different narrative texts such as *Pinocchio*, *Snow White*, and *The Legend of Surabaya*.

**2.3 Post-test**

After completing the treatment, a post-test was conducted to measure any improvement in students' vocabulary knowledge. The post-test contained the same three questions from the pre-test, designed to assess the student's progress in vocabulary comprehension after being taught using the PBL method. By comparing the pre-test and post-test scores, the researcher aimed to evaluate the effectiveness of the PBL intervention in improving the students' vocabulary.

**2.4 Sample Size**

The sample for this study consisted of 50 students from two ninth-grade classes at SMP Muhammadiyah Tilango. The experimental class included 25 students, while the control class also had 25 students. The students were selected using purposive sampling based on their low vocabulary scores in previous assessments and teacher recommendations.

**2.5 Data Analysis**

Data collected from the pre-test and post-test were analyzed using statistical methods to determine the impact of the PBL treatment. The primary tool for analysis was the t-test to compare the pre-test and post-test scores of both the experimental and control groups. The t-test was used to assess whether the observed differences in vocabulary improvement between the two groups were statistically significant. The hypothesis testing was conducted with the following criteria:

1. H0 (Null Hypothesis): There is no significant difference in vocabulary improvement between students taught with PBL and those taught without PBL.
2. Ha (Alternative Hypothesis): There is a significant difference in vocabulary improvement between students taught with PBL and those taught without PBL.

A p-value less than 0.05 would indicate that the null hypothesis should be rejected, confirming that the use of PBL significantly improves students' vocabulary.

## 3. RESULT AND DISCUSSION

In this study, the pre-test and post-test results of both the control and experimental groups were analyzed to assess the overall effectiveness of Problem-Based Learning (PBL) in improving students' vocabulary. The study involved multiple meetings where students were exposed to different stories, and their vocabulary comprehension was assessed over time. The control group, which did not use PBL, showed some improvement, but the experimental group, which employed PBL, demonstrated a more significant increase in vocabulary proficiency.

**3.1 Results of Meetings with PBL**

In the first meeting, using the story of *Sangkuriang*, students had a low initial understanding of vocabulary, with an average score of 18.68%. This reflected the initial challenge most students faced in comprehending vocabulary. During the second meeting, using the story *A Hungry Crocodile*, the average score increased to 32.5%, showing a noticeable improvement of 13.82%. The third meeting, which used the story *Sura and Baya*, resulted in a further increase in vocabulary comprehension, with the average score rising to 41.66%, representing a total improvement of 22.98%. Finally, in the fourth meeting, with the story *Fox and Cat*, the average score reached 51.66%, showing a cumulative increase of 32.98% from the first meeting.

These results suggest that PBL effectively enhanced students' vocabulary comprehension over time by engaging them with real-world problem-solving activities. The following table summarizes the average scores from Meetings I to IV for both the control and experimental groups:

Table 1. Average Score of Meeting I to IV in Control and Experiment Groups

| Meeting | Control | Experimental |
|---|---|---|
| I | 18,75 | 21,25 |
| II | 32,50 | 35,00 |
| III | 41,67 | 44,558 |
| IV | 51.67 | 58,75 |

Source: Processed Data (2023)

The data shows that both the control and experimental groups improved across meetings, but the experimental group, which used PBL, demonstrated consistently higher progress.

**3.2 Pre-Test and Post-Test Results**

The study also analyzed the pre-test and post-test scores of both the control and experimental groups to measure the overall effectiveness of PBL in improving students' vocabulary. The control group, which did not use PBL, had an average pre-test score of 50.69, which increased to 68.25 after the post-test. Meanwhile, the experimental group, which implemented PBL, started with a slightly higher pre-test score of 56.69, and the post-test score increased to 69.00.

This comparison demonstrates that while traditional teaching methods led to moderate vocabulary improvement, the PBL approach in the experimental group resulted in a greater gain in vocabulary proficiency. The following table summarizes the pre-test and post-test results for both groups:

Tabel 2. Mean scores of pretest and posttest of control and experimental Group

| Group | Pre-Test Score | Post-Test Score |
|---|---|---|
| Control | 50,69 | 68,25 |
| Experimental | 56,69 | 69,00 |

Source: Processed Data (2023)

These tables illustrate the effectiveness of PBL in improving vocabulary comprehension in the experimental group, particularly in comparison with the control group, where the gains were smaller. This data supports the conclusion that PBL is a valuable method for enhancing vocabulary acquisition in narrative texts.

**3.1 Initial Vocabulary Comprehension and Early Meetings**

This study was conducted to evaluate the effectiveness of the Problem-Based Learning (PBL) model in improving students' vocabulary in narrative texts among Grade Nine students of SMP Muhammadiyah Tilango. The research was carried out over several meetings, and both quantitative and qualitative data were collected through pre-tests and post-tests. The experimental group used the PBL model, while the control group did not, allowing for a comparative analysis of the two teaching methods.

In the first meeting, which focused on the story of *Sangkuriang*, the findings revealed that most students struggled significantly with vocabulary comprehension. On average, only 18.68% of the students understood the vocabulary presented in the narrative text. This low level of comprehension suggests that students lacked prior exposure to the vocabulary or found the story's context challenging to understand. The results of this meeting highlight the baseline level of vocabulary proficiency before the introduction of PBL.

During the second meeting, which featured the story of *A Hungry Crocodile*, there was a notable improvement in students' vocabulary comprehension. The average score increased to 32.5%, representing a gain of 13.82% from the previous meeting. This increase can be attributed to the application of the PBL model, which encourages students to engage more actively with the text by identifying problems and finding solutions through collaborative learning. The improvement observed in this meeting suggests that PBL helped students contextualize vocabulary within the story, facilitating better comprehension.

**3.2 Progressive Improvement Through Problem-Based Learning**

By the third meeting, where the story of *Sura and Baya* was discussed, students continued to show progress, with their vocabulary understanding improving to 41.66%. This represents a cumulative increase of 22.98% compared to the initial meeting. This consistent improvement over time indicates that PBL, as a learning approach, provides students with opportunities to actively engage with vocabulary in meaningful contexts, leading to gradual mastery. The third meeting's results suggest that repeated exposure to PBL-based activities helps deepen students' understanding and retention of vocabulary, particularly as they become more familiar with the learning process.

The fourth meeting, which utilized the story of *Fox and Cat*, saw the highest increase in students' vocabulary comprehension, with an average score of 51.66%, reflecting a total improvement of 32.98% from the first meeting. These results further support the efficacy of PBL, as students were able to demonstrate significant improvement throughout four sessions. The consistent application of PBL in these sessions not only engaged students but also allowed them to become more comfortable with the problem-solving approach to learning vocabulary. This cumulative effect emphasizes the long-term benefits of PBL in enhancing language skills.

### 3.3 Comparative Analysis and Statistical Significance

When comparing the control and experimental groups, the data shows a clear difference in outcomes. The control group, which did not receive PBL treatment, experienced moderate gains in vocabulary skills. In contrast, the experimental group, which participated in PBL, saw a more substantial improvement in both their pre-test and post-test scores. Specifically, the average pre-test score of the control group was 50.69, which increased to 68.25 in the post-test. In the experimental group, the average pre-test score was slightly higher at 56.69, with a post-test score of 69.00. Although both groups showed improvement, the experimental group demonstrated greater gains in vocabulary proficiency. These results illustrate the positive impact of PBL on student outcomes, reinforcing its potential as a more effective instructional strategy for vocabulary acquisition compared to traditional methods.

The results of the t-test analysis further substantiate these findings. In comparing the initial test scores between the control and experimental groups, the t-test yielded a t-count of 1.949 with a p-value of 0.061, which is greater than 0.05, indicating no significant difference in vocabulary proficiency between the two groups at the beginning of the study. This suggests that both groups started with similar levels of vocabulary ability in narrative text, providing a solid foundation for a comparative analysis of the PBL intervention. However, the post-test analysis revealed a significant difference between the two groups. The t-test for the post-test scores resulted in a t-count of 4.108 with a p-value of 0.000, which is less than 0.05. This significant result indicates that the experimental group, which used PBL, experienced a substantially greater improvement in vocabulary proficiency compared to the control group. The findings suggest that PBL was highly effective in enhancing students' vocabulary skills, allowing them to better understand and retain new words in the context of narrative texts.

Additionally, the t-test comparing the pre-test and post-test results within each group provides further insights into the effectiveness of both methods. For the control group, the t-test showed a t-count of 5.782 with a p-value of 0.000, signifying a significant improvement in vocabulary ability from the pre-test to the post-test, even without the application of PBL. This suggests that while traditional learning methods can lead to vocabulary gains, they may not be as effective as PBL in fostering deeper, more meaningful learning experiences.

In the experimental group, the t-test analysis yielded a t-count of 4.236 with a p-value of 0.000, demonstrating a significant increase in vocabulary proficiency between the pre-test and post-test. The results confirm that PBL led to substantial improvements in students' ability to comprehend and use new vocabulary in narrative texts. The greater gains observed in the experimental group compared to the control group underline the effectiveness of PBL in supporting active learning, problem-solving, and collaborative discussion, all of which contribute to enhanced vocabulary acquisition.

## 4. CONCLUSION AND RECOMMENDATION

### 4.1 Conclusion

Based on the results and discussion of the research, it can be concluded that the use of problem-based learning (PBL) has a positive impact on improving students' vocabulary in narrative texts at SMP Muhammadiyah Tilango. The significant increase in vocabulary mastery across the experimental group, as shown in the pre-test and post-test results, underscores the effectiveness of PBL in engaging students in meaningful problem-solving tasks that enhance their language comprehension and usage. The steady improvement over the four meetings further highlights how PBL can be a valuable tool for teaching narrative texts, as it encourages active participation and critical thinking in vocabulary learning.

This research contributes to the field of education, particularly in language learning, by demonstrating the practical application of PBL in improving vocabulary acquisition. It provides valuable insights into how PBL can be integrated into narrative text learning to foster a deeper understanding of language among students. For teachers, this study suggests that PBL can serve as an alternative teaching strategy to enhance student engagement and improve language skills. Furthermore, the findings offer an empirical foundation for educators seeking to innovate vocabulary instruction, contributing to ongoing efforts to create more effective and engaging classroom practices.

### 4.2 Recommendation

In terms of recommendations for future studies, researchers can further explore other aspects that may enhance vocabulary mastery, such as integrating multimedia resources or incorporating collaborative learning models alongside PBL. Future research could also consider longitudinal studies to observe the long-term effects of PBL on vocabulary retention and overall language proficiency. Additionally, expanding the scope of research to include diverse student demographics and different types of narrative texts could provide a more comprehensive understanding of PBL's potential in various educational contexts.

In conclusion, this study has not only shown the benefits of problem-based learning in improving vocabulary but has also paved the way for future innovations in language education. It emphasizes the need for continuous improvement in teaching strategies to better address students' learning needs and adapt to the evolving demands of education. By adopting PBL and similar interactive approaches, educators can create more dynamic and effective learning environments that foster both academic success and critical thinking.

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