

The Effect of Problem-Based Learning on the First-Grade Students' Reading Comprehension at SMK GKPI 2 Pematangsiantar

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Abstract

This research discusses the effect of Problem-Based Learning (PBL) on students' reading comprehension at SMK GKPI 2 Pematangsiantar. This research used a quantitative method with a quasi-experimental design. The population of this research consisted of the first-grade students of SMK GKPI 2 Pematangsiantar in the academic year 2025/2026. The sample consisted of 31 students divided into two groups: 16 students in the experimental class and 15 students in the control class. The experimental class was taught using Problem-Based Learning, while the control class was taught using the conventional teaching method. The instrument used in this research was a reading comprehension test consisting of multiple-choice and short-answer questions. The data were collected through pre-test and post-test. The results showed that the students in the experimental class experienced greater improvement in reading comprehension compared to the control class. The statistical analysis using the Mann–Whitney U Test indicated that there was a significant difference between the post-test scores of the experimental and control groups. Therefore, the alternative hypothesis (H_1) was accepted and the null hypothesis (H_0) was rejected. Based on the findings, it can be concluded that Problem-Based Learning has a significant effect on students' reading comprehension.

Keywords: Problem-Based Learning, Reading Comprehension, Experimental Research

INTRODUCTION

Language is one of the important aspects of life. Everyone certainly use language for social interaction because it has a function to connect themselves with people around in daily activities such as interacting, communicating, socializing with the surrounding environment to obtain information through thoughts, ideas, and feelings. English is a foreign language that is

968

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often used as a language learning because English is the determining thing of all language skills. There are four basic skills in learning English. The four skills include: Listening, speaking, reading, and writing.

Good English language skills help students develop intellectually, socially, and emotionally. One of the important skills required for students is the ability to use English, both spoken and written. However, many students at the senior high school level are still not fully prepared to comprehend English texts effectively. They often struggle to understand reading materials, which are essential for their learning process. Therefore, the role of the teacher becomes crucial in improving the quality of teaching and learning, particularly in reading comprehension.

Reading is one of the most important basic skills in language learning for students to learn. Reading is the act of deriving meaning from written text, requiring students to engage with the material to gather information that enhances their thoughts and helps them produce ideas from the text they have read. According to Pang states that Reading is the process of comprehending written text, a complex activity that engages both perception and thinking. It is composed of two interconnected processes: word recognition and comprehension. Word recognition leads to the ability to perceive how written symbols correspond to spoken language. Comprehension involves making sense of interconnected words, sentences, and texts. Reading is an interactive process between the reader and the text, focused on understanding the author's message. During reading, it's essential to grasp both the meaning of the text and the information it conveys. After extracting information from the text, full comprehension is still required. Thus, reading and comprehension are inseparable.

Reading comprehension is the ability to understand what the meaning of the reading. According to Brassell and Rasinski, reading comprehension is the ability to extract information from written text and then apply that knowledge or demonstrate an understanding of the information obtained. In reading it is not just reading sentences, but they also have to understand the content contained in the text. In this reading comprehension, readers are expected to be able to identify the main idea in the paragraph, obtain information from the text, conclude the reading text correctly, and also have to find what the purpose of the text. Reading comprehension is usually difficult to master if students do not know what the sentence means and understand the reading. According to Tiwery (2024), usually what often happens to students when learning reading comprehension is difficulty understanding text. In addition, students also have difficulty spelling in a sentence, lack of vocabulary and extensive reading memory.

Education in Indonesia, there are still teachers who do not understand the concept of



teaching and learning. Teachers today still use the old way of teaching because the old way gives better results. Actually they still cannot leave the old learning models that teachers have mastered, teachers are still not sure that the new learning models are better.

Recent observations and studies reveal that many Indonesian vocational high school students face significant challenges in reading comprehension. According to the 2023 National Examination Report by the Ministry of Education and Culture, the average reading score for vocational students was below the national standard, indicating poor comprehension of texts in English. Furthermore, classroom observations at SMK GKPI 2 Pematangsiantar show that most first-year students rely heavily on the teacher's explanation and are less engaged in active reading activities. This problem is compounded by the traditional teacher-centered approach, where students passively receive information rather than constructing their own understanding. Such conditions lead to low motivation, limited vocabulary acquisition, and minimal critical thinking. Given this phenomenon, there is an urgent need for a learning model that promotes active engagement, problem-solving, and collaboration key aspects of 21st-century skills. Problem-Based Learning (PBL) offers these benefits, making it a relevant and innovative alternative to traditional methods, especially for improving reading comprehension skills among vocational students.

Considering this situation, it is crucial to implement teaching strategies that can actively involve students in the learning process and help them become better readers. One of the learning models that has been gaining attention in recent years is Problem-Based Learning (PBL). PBL is a student-centered approach that presents students with real-life problems to solve collaboratively. The learning process is structured around challenges that encourage students to think critically, conduct their own research, and present findings, rather than simply listening to lectures and memorizing information. In the context of reading comprehension, PBL offers a meaningful way for students to engage with texts. It pushes them to identify problems in a reading passage, analyze content, connect it with prior knowledge, and find solutions, all of which are higher-order thinking skills.

Theoretically, PBL is supported by constructivist learning theories, particularly Vygotsky's social constructivism, which emphasizes learning through interaction and collaboration. When students work in groups to solve reading-based problems, they exchange ideas, question assumptions, and build understanding together. Practically, several studies have shown that PBL can increase student motivation, improve critical thinking, and enhance language skills, including reading. According to Hmelo-Silver (2004), PBL helps learners develop flexible knowledge and effective problem-solving skills. Furthermore, research by Duch, Groh, and Allen (2001) indicates

that students involved in PBL contexts tend to retain information longer and apply it more effectively in different situations.

Other researchers have also found that PBL improves reading comprehension specifically. A study by Nugraheni (2018) revealed that students taught using PBL showed significant improvement in reading skills compared to those taught using traditional methods. Another study by Siregar & Manik (2020) found that the PBL model encourages active participation and fosters deeper understanding of reading materials. These findings align with what I have observed personally during classroom practices. When students are given reading tasks that are tied to a real problem or issue, they are more likely to read carefully, ask questions, and discuss the meaning of the text with their peers.

At SMK GKPI 2 Pematangsiantar, implementing PBL could be a relevant and strategic step toward addressing students' reading difficulties. Given the current curriculum that emphasizes student-centered learning and critical thinking, PBL can be adapted as a practical model to bridge the gap between reading theory and actual understanding.

RESEARCH METHODS

This research employed a quantitative method with a quasi-experimental design, specifically a pre-test and post-test control group design. This design was chosen because the researcher aimed to investigate whether there was a significant effect of using Problem-Based Learning (PBL) on students' reading comprehension. In this study, two groups were involved, namely an experimental group and a control group. Both groups were given a pre-test to measure their initial reading comprehension ability. After that, the experimental group was taught using the Problem-Based Learning method, while the control group was taught using the conventional teaching method. At the end of the treatment, both groups were given a post-test to determine any improvement in their reading comprehension skills. This design allows the researcher to compare the learning outcomes between the two groups.

The population of this study consisted of first-grade students of SMK GKPI 2 Pematangsiantar in the 2025/2026 academic year. These students were chosen because they are in the early stage of vocational education and are still developing their reading comprehension skills, making them suitable for examining the effect of Problem-Based Learning. According to Arikunto (2010), a population refers to the entire group of subjects that are the focus of a study. From this population, a sample of 31 students was selected. The sampling technique used in this study was purposive sampling, which is a non-probability sampling technique where participants are selected based on specific characteristics and research needs.



The sample was divided into two groups: 16 students were assigned to the experimental group and 15 students to the control group. The experimental group received instruction through Problem-Based Learning, while the control group was taught using the conventional method. This grouping was intended to provide a clear comparison between the two teaching approaches.

The independent variable in this study was Problem-Based Learning, while the dependent variable was students' reading comprehension. The independent variable is the factor that influences the outcome, while the dependent variable is the outcome that is measured. According to Creswell (2012), variables are characteristics that can be measured and that vary among individuals or groups. In this study, the effect of PBL was measured through students' performance in reading comprehension tests. The instrument used to collect data in this research was a reading comprehension test. The test consisted of multiple-choice and short-answer questions designed to assess students' ability to identify main ideas, understand vocabulary, make inferences, and evaluate information from reading texts. The instrument was administered twice, as a pre-test and a post-test, in order to measure students' initial ability and their improvement after the treatment.

The data collection technique involved administering pre-tests and post-tests to both the experimental and control groups. The pre-test was conducted before the treatment to determine the students' initial reading comprehension level. After the treatment was given, the post-test was administered to both groups using a test of similar difficulty. The purpose of the post-test was to measure any changes in students' reading comprehension after the implementation of Problem-Based Learning.

The collected data were analyzed using SPSS version 31. The analysis began by calculating the mean scores of both groups. Then, a normality test was conducted to determine whether the data were normally distributed, followed by a homogeneity test to check whether the variances of the two groups were equal. If the data met the assumptions of normality and homogeneity, an independent sample t-test was used to test the hypothesis, while a paired sample t-test was used to compare pre-test and post-test results within each group.

However, if the data were not normally distributed, a non-parametric test was applied instead. In this study, the Mann-Whitney U test was used to compare the differences between the experimental and control groups when the assumption of normality was not met. This statistical procedure ensured that the data analysis remained valid regardless of distribution conditions. The results of these analyses were used to determine whether Problem-Based Learning had a significant effect on students' reading comprehension.



RESULTS AND DISCUSSION

The findings of this study show that both the control class and the experimental class experienced improvement in reading comprehension after the teaching process. However, the experimental class, which was taught using Problem-Based Learning (PBL), demonstrated better overall performance compared to the control class. This result is supported by the higher post-test mean score and the result of the Mann-Whitney U Test, which showed a significance value of 0.047, lower than the significance level of 0.05. Therefore, it can be concluded that Problem-Based Learning had a significant effect on students' reading comprehension.

The improvement in students' reading comprehension can be explained through the theory of Problem-Based Learning. According to Barrows (1986), Problem-Based Learning is a student-centered learning method that encourages students to solve problems through critical thinking, discussion, and collaborative learning. In the learning process, students are not only required to memorize information, but they are also encouraged to analyze situations, identify important information, and construct understanding independently. This learning process helps students become more active in understanding the meaning of the text.

In reading comprehension, students need not only to understand explicit information but also to identify implied meanings, make conclusions, and interpret the content of the text. Through Problem-Based Learning, students were encouraged to discuss narrative texts, identify problems in the stories, and find solutions collaboratively. This process supported students in understanding the text more deeply because they became directly involved in analyzing the reading material. As a result, students were able to improve their comprehension skills more effectively.

Furthermore, the findings of this study are also related to constructivist learning theory proposed by Vygotsky (1978), which states that knowledge is constructed through social interaction and active participation. In Problem-Based Learning, students work together in groups to discuss problems and exchange ideas. This interaction allows students to gain new understanding from their peers and helps them develop better comprehension of the reading texts. Therefore, the implementation of PBL created a more meaningful learning experience compared to the conventional teaching method.

The effectiveness of Problem-Based Learning in this study can also be seen from the students' performance during the learning process. Students in the experimental class were more involved in identifying the main ideas, understanding vocabulary in context, drawing conclusions, and interpreting information from narrative texts. The learning activities

encouraged students to think critically and connect the content of the text with real-life situations. This condition differs from the conventional teaching method, where students mostly depended on teacher explanation and individual learning activities.

Another reason why PBL was effective is because the method encourages students to become independent learners. According to Savery (2006), Problem-Based Learning develops students' problem-solving ability, self-directed learning, and critical thinking skills. In this study, students were required to analyze problems presented in narrative texts and discuss possible answers with their group members. As a result, students became more confident in expressing their opinions and understanding the material independently. This learning process helped students improve their reading comprehension achievement.

The findings of this study are consistent with several previous studies related to the implementation of Problem-Based Learning in reading comprehension. For example, a study conducted by Rahman (2021) found that PBL significantly improved students' reading comprehension because students became more active in analyzing texts and discussing ideas collaboratively. Similarly, Siregar (2020) reported that students taught using Problem-Based Learning achieved higher reading comprehension scores compared to students taught using conventional teaching methods. These findings support the result of the current study, which also shows that students in the experimental class performed better than students in the control class.

In addition, this study is also supported by the research conducted by Dewi (2019), which revealed that Problem-Based Learning encourages students to become more motivated and actively participate in classroom discussions. Through active participation, students are able to understand reading materials more effectively. The current study similarly found that students taught using PBL achieved higher post-test scores and higher mean rank values compared to students taught using the conventional method.

Although the findings of this study are similar to previous research, there are several differences between this study and earlier studies. One difference is related to the research subjects and educational context. Most previous studies focused on senior high school students, while this study focused on first-grade vocational high school students at SMK GKPI 2 Pematangsiantar. Vocational school students have different learning characteristics because they are prepared for practical and professional skills. Therefore, this study provides additional evidence that Problem-Based Learning can also be effectively implemented in vocational school contexts.

Another difference is related to the statistical analysis used in this study. Several previous

studies used parametric statistical tests such as the independent sample t-test because their data were normally distributed. However, in this study, the data were not normally distributed based on the Shapiro-Wilk test results. Therefore, the researcher used the Mann-Whitney U Test as a non-parametric alternative. This makes the statistical analysis in this study more appropriate based on the characteristics of the data obtained.

This study also has several strengths compared to previous studies. First, this study used both pre-test and post-test to measure students' improvement before and after the treatment. This design allowed the researcher to observe students' progress more clearly. Second, the study compared two different teaching methods directly, namely Problem-Based Learning and the conventional method. Third, the study used appropriate statistical procedures by conducting normality tests before determining the hypothesis testing method. This increased the validity of the research findings.

Furthermore, this study provides practical contributions for English teachers, especially in teaching reading comprehension. The findings suggest that Problem-Based Learning can be used as an alternative teaching strategy to improve students' understanding of reading texts. Through PBL, students are encouraged to participate actively, think critically, and collaborate with other students during the learning process. These activities help students understand reading materials more effectively compared to passive learning approaches.

However, this study also has several limitations. First, the number of participants in this study was relatively small, consisting of only 31 students. A larger sample size may provide more accurate and generalizable results. Second, the duration of the treatment was limited, so the long-term effect of Problem-Based Learning on students' reading comprehension could not be fully observed. Third, this study only focused on narrative texts; therefore, the findings may not fully represent the effectiveness of PBL for other types of reading materials such as descriptive, recount, or argumentative texts.

Another limitation is that this study only used quantitative data obtained from tests. As a result, the researcher could not explore students' opinions, feelings, or learning experiences during the implementation of Problem-Based Learning. Future researchers are recommended to combine quantitative and qualitative methods, such as interviews or classroom observations, in order to obtain more comprehensive findings regarding the effectiveness of PBL.

Overall, the findings of this study indicate that Problem-Based Learning is an effective teaching method for improving students' reading comprehension. The implementation of PBL helped students understand narrative texts more effectively through problem-solving activities, discussion, collaboration, and active participation.



CONCLUSION

Based on the results of the research and data analysis, both the control and experimental classes showed improvement in students' reading comprehension after the teaching process. The control class increased from a mean score of 63.00 in the pre-test to 76.13 in the post-test, while the experimental class improved from 71.81 to 84.37. Although both groups improved, the experimental class consistently achieved higher overall scores compared to the control class. The results of the normality test indicated that some of the data were not normally distributed; therefore, the Mann-Whitney U Test was used to test the hypothesis. The result showed a significance value of 0.047, which is lower than 0.05, indicating that there was a statistically significant difference between the experimental and control groups. In addition, the experimental class obtained a higher mean rank (19.13) compared to the control class (12.67), showing better reading comprehension performance among students taught using Problem-Based Learning.

Based on these findings, it can be concluded that Problem-Based Learning had a significant effect on students' reading comprehension at SMK GKPI 2 Pematangsiantar. The use of Problem-Based Learning helped students improve their understanding of reading texts through active learning, discussion, and problem-solving activities, making it more effective than the conventional teaching method.

REFERENCES

- Anderson, N. J. (2014). Developing engaged second language readers. In N. K. Duke & P. D. Pearson (Eds.), *Handbook of effective literacy instruction* (pp. 448–460). Guilford Press.
- Aniati, A., Herman, H., Siregar, C. A. E., Afianti, D., Manurung, R., Fatmawati, E. and Saputra, N. (2025). Teaching Reading Comprehension on Narrative Texts Through Whatsapp Group Features: An E-Learning Implementation in Junior Highs Schools. *JOLLT Journal of Languages and Language Teaching*, 13(1), 330-341.
<https://doi.org/10.33394/jollt.v13i1.12853>
- Arikunto, S. (2010). *Prosedur penelitian: Suatu pendekatan praktik* (Revised ed.). Rineka Cipta.
- Asnawi, A., Sinaga, Y.K., Herman, H., Sianturi, B.K., Kartolo, R., & Tannuary, A. (2025). Investigating Teaching Learning Strategies in Improving EFL Learners' Reading Comprehension: A Lesson Learned from Junior High Schools. *JOLLT Journal of Languages and Language Teaching*, 13(1), 189-202. DOI: <https://doi.org/10.33394/jollt.v13i1.13362>



- Brown, H. D. (2004). *Language assessment: Principles and classroom practices*. Pearson Education.
- Cain, K., & Oakhill, J. (2007). *Children's comprehension problems in oral and written language: A cognitive perspective*. Guilford Press.
- Cahya, M., Damiri, A., & Febriyanti, R. (2023). The effectiveness of problem-based learning in improving students' reading comprehension at the senior high school level. *Journal of Language Education and Research*, 12(2), 145–158.
- Cohen, L., Manion, L., & Morrison, K. (2018). *Research methods in education* (8th ed.). Routledge.
- Creswell, J. W. (2014). *Research design: Qualitative, quantitative, and mixed methods approaches* (4th ed.). SAGE Publications.
- Dewi, N. (2019). The effect of problem-based learning on students' reading comprehension achievement. *Journal of English Education Studies*, 2(1), 45–52.
- Duke, N. K., & Pearson, P. D. (2002). Effective practices for developing reading comprehension. In A. E. Farstrup & S. J. Samuels (Eds.), *What research has to say about reading instruction* (3rd ed., pp. 205–242). International Reading Association.
- Enni, A., Lestari, D., & Putri, S. (2024). Folktales and problem-solving activities to improve reading comprehension of vocational students. *Journal of Applied Linguistics and Education*, 15(1), 67–78.
- Field, A. (2018). *Discovering statistics using IBM SPSS statistics* (5th ed.). SAGE Publications.
- Gall, M. D., Gall, J. P., & Borg, W. R. (2010). *Applying educational research: How to read, do, and use research to solve problems of practice* (6th ed.). Pearson.
- Grellet, F. (2010). *Developing reading skills: A practical guide to reading comprehension exercises* (2nd ed.). Cambridge University Press.
- Herman, H., Sinaga, Y. K., & Simatupang, G. E. (2024). An Investigation to the Students' Difficulties in the Skills of Reading Comprehension at TOEFL Proficiency Subject. *Bulletin of Science Education*, 4(2), 40–48. <https://doi.org/10.51278/bse.v4i2.1154>
- Herman, H., Sipayung, R. W., Sari, I., Soliev, M., Sidabalok, F. Y., Hai, N. T., Ngongo, M., and Purba, N. (2025). Enhancing English Reading Comprehension in Secondary School Students through Pair Check Technique: Insights into Effective Teaching Strategies. *World Journal of English Language*, 15(7), 370-381. <https://doi.org/10.5430/wjel.v15n7p370>
- Hmelo-Silver, C. E. (2004). Problem-based learning: What and how do students learn? *Educational Psychology Review*, 16(3), 235–266. <https://doi.org/10.1023/B:EDPR.0000034022.16470.f3>



- Hmelo-Silver, C. E., & Eberbach, C. (2021). Learning through problem-based learning environments. *Educational Psychologist*, 56(4), 250–266.
- Irwansyah, S. S., Sinaga, V., Tobing, V. S. B. L., Herman, H., & Manurung, R. (2025). Implementing Read Along as a digital reading media for Grade VII students of SMP IT Cendekia Pematangsiantar. *Research Journal in Translation, Literature, Linguistics, and Education*, 1(3), 32-41. <https://doi.org/10.64120/eqtkd920>
- Iskandar, T., Sari, N., & Hidayat, F. (2021). Enhancing critical thinking in reading through problem-based learning. *Asian EFL Journal*, 25(4), 212–227.
- Intan, R., & Kirana, M. (2022). The effect of problem-based learning on the reading comprehension of eleventh-grade science students. *Journal of Language Teaching and Literature*, 10(3), 89–99.
- Kaganang, R. (2019). The impact of problem-based learning on reading comprehension of first-grade high school students in Halmahera. *Indonesian Journal of English Language Teaching*, 14(2), 134–148.
- Lahonda, A., & Karmila, S. (2023). Problem-based learning in improving reading comprehension and soft skills of vocational students. *Journal of English Education*, 8(1), 54–66.
- Mikulecky, B. S., & Jeffries, L. (2004). *More reading power: Reading for pleasure, comprehension skills, thinking skills, reading faster* (2nd ed.). Longman.
- Nugraheni, R. (2018). The use of problem-based learning to improve students' reading comprehension. *Journal of English Education*, 6(2), 45–56.
- Pallant, J. (2020). *SPSS survival manual: A step-by-step guide to data analysis using IBM SPSS* (7th ed.). McGraw-Hill Education.
- Purba, D. (2019). Improving reading comprehension through problem analysis and group discussions at a private university in North Sumatra. *Journal of Education and Practice*, 10(5), 77–86.
- Rahman, A. (2021). The implementation of Problem-Based Learning in improving students' reading comprehension. *Journal of Language Teaching and Learning*, 5(2), 88–96.
- Sianturi, B. K., Herman, H., Sinaga, Y. K., Sinurat, B., & Tannuary, A. (2024). Investigating Teachers' Strategies in Teaching Reading Comprehension. *International Journal of Learning Development and Innovation*, 1(2), 115–121. Retrieved from <https://gscjournal.com/IJLDI/article/view/40>
- Sidik, N., & Masek, A. (2021). Problem-based learning and its alignment with the 2013 Curriculum: Effects on reading and vocabulary. *International Journal of Instruction*, 14(1), 241–254.





- Sinamo, D. S., Herman, H., & Marpaung, T. I. (2023). Teaching reading comprehension on narrative text by using short story: A case on teaching method. *Journal of Education, Linguistics, Literature, and Art*, 1(1), 31–43. <https://doi.org/10.62568/ella.v1i1.17>
- Siregar, L. D., & Manik, S. (2020). Improving students' reading comprehension through problem-based learning. *International Journal of English Language Teaching*, 8(4), 102–110.
- Snow, C. E. (2002). *Reading for understanding: Toward an R&D program in reading comprehension*. RAND Corporation.
- Ur, P. (2012). *A course in English language teaching* (2nd ed.). Cambridge University Press.
- Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.
- Widisetia, P. (2017). The application of project-based learning to improve reading comprehension in Yogyakarta. *Journal of Educational Action Research*, 5(2), 102–116.
- Yuliana, F., Hartono, R., & Saputra, A. (2024). Comparing problem-based learning and SQ3R method in improving reading comprehension. *Journal of Education and Language Studies*, 19(1), 88–101.

