THE EFFECT OF PROJECT-BASED LEARNING ON STUDENTS' READING SKILLS: COMPARISON OF EFFECT BETWEEN GRAMMATICAL COMPETENCE AND VOCABULARY MASTERY AT JUNIOR HIGH SCHOOL

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Abstract

This research aimed to determine the effect of Project-Based Learning (PBL) on students' reading skills when viewed from grammatical competence and vocabulary mastery, as well as to examine the interaction between PBL and these two aspects. A quasi-experimental research design was employed in this study. The subjects were second-grade students of a junior high school English class. The sample consisted of 33 active students from Class B. Data were collected through classroom teaching activities and analyzed using tests of normality and homogeneity, an independent samples t-test, and a two-way ANOVA. The results revealed a significant effect of Project-Based Learning compared to the traditional method on students' reading skills. The findings also showed an interaction between the learning method and students' reading skills. However, no significant interaction was found between grammatical competence and vocabulary mastery in relation to Project-Based Learning. These results indicate that Project-Based Learning is effective in improving students' reading skills, although its effectiveness is not influenced by students' levels of grammatical competence and vocabulary mastery.

INTRODUCTION

Developing strong reading skills among English as a Foreign Language (EFL) learners has become increasingly important in today's educational environment. Grabe and Stoller (2011) emphasize that reading comprehension is essential not only for academic success but also for accessing a wide range of English-language resources. However, EFL students face particular challenges in reading, which are often caused by limited grammatical competence and insufficient vocabulary mastery. Research indicates that these two aspects are crucial for understanding English texts because they directly affect students' ability to decode meaning, comprehend sentence structures, and interpret unfamiliar vocabulary in context (Nassaji, 2003). Unfortunately, traditional methods of teaching reading in EFL classrooms often separate grammar and vocabulary instruction from actual reading activities, which limits students' ability to apply their linguistic knowledge in meaningful contexts (Richards, 2015).

Project-Based Learning (PBL), particularly its application in English language instruction, offers several advantages for the development of reading skills. Numerous scholars and educators have highlighted the benefits of PBL in teaching English reading. First, PBL increases students' motivation and engagement because it emphasizes meaningful, real-world projects (Markham, 2011). Second, PBL promotes deeper understanding and critical thinking, as it requires students to analyze, synthesize, and evaluate information, which supports improved reading comprehension (Meyer, McGrath, & Cook, 2017). Third, PBL encourages collaboration and social learning. According to Dewey and later scholars such as Vygotsky (1978), learning is inherently social in nature. Fourth, PBL allows students to connect their reading activities to real-world issues and projects, making reading more meaningful and relevant (Buck Institute for Education, 2015). Fifth, PBL supports the development of 21st-century skills, including problem-solving, communication, and collaboration (Saavedra & Opfer, 2012). Sixth, PBL enhances language acquisition by integrating multiple language skills—reading, writing, speaking, and listening—in a natural and holistic manner (DeCapua, 2012). Finally, PBL encourages critical engagement with diverse texts, which is essential for developing higher-order thinking skills (Perkins, 1992).

In this study, the researchers focused on second-grade students in the English class at SMPN 1 Kopang and implemented Project-Based Learning as an instructional approach. The use of Project-Based Learning is expected to transform the educational experience by making

learning more engaging, relevant, and effective. This study aimed to explore how the Project-Based Learning method facilitates the development of students' reading skills by considering two key aspects: grammatical competence and vocabulary mastery.

LITERATURE REVIEW

Project-based learning concerns the learning activity based on real world problems and challenges that require students to work as a team through meaningful activities and result in a final product According to Simpson (2011). An educational strategy known as "project-based learning" places a strong emphasis on active learning via interesting tasks. According to Thomas (2000), PBL facilitates deeper understanding and application of knowledge by allowing students to explore real-world problems. This approach fosters creativity, critical thinking, and teamwork, all of which can improve the entire educational experience for pupils.

Reading skills include a range of abilities required to comprehend and interpret literature, such as fluency, understanding, and the capacity to assess and evaluate information. According to the National Reading Panel (2000), effective reading instruction should integrate skills such as vocabulary development and grammatical understanding. Reading is the meaningful interpretation of printed or written verbal symbols (Harris, 1975). Reading is a result of the interaction between the perception of graphic symbols that represent language and the readers' language skills and knowledge of the world. Reading skill is essential as it enables students to acquire information and expand their knowledge base, making it a priority in education (Widowati & Kurniasih, 2018). It serves as an efficient means to gather insights on various topics, as noted by Ismail et al. (2017), and is recognized as one of the key receptive skills that students need to develop.

The term "grammatical competence" describes a learner's comprehension of the rules governing word usage and sentence construction. Chomsky (1965) emphasizes that grammatical knowledge is foundational for effective communication and comprehension. Students often produce and communicate their results in PBL contexts, which calls for the application of grammatical rules and strengthens their grammatical competency. According to Canale and Swain (1980), grammatical competence is mainly defined in terms of linguistic competence that is why some theoreticians use the term linguistic competence for grammatical competence.

Mastering vocabulary entails understanding word meanings and learning how to utilize them appropriately in context. Beck, McKeown, and Kucan (2002) highlight that vocabulary

knowledge is crucial for reading comprehension. The term "vocabulary" describes the stored knowledge of word meanings and pronunciations that are essential for communication. The acquisition of vocabulary is essential for language learners as it is fundamental to language itself.

METHODS

Research Participants

The population of this study consisted of all second-grade students of SMPN 1 Kopang. Each class comprised 33 students. Due to the relatively small population size, a saturated sampling technique was employed, in which all members of the population were included as research participants. This approach ensured that the sample accurately represented the population.

This study involved two classes, namely Class VIII A and Class VIII B. Class VIII A, consisting of 33 students, served as the control group and was taught using the traditional instructional method. Class VIII B, also consisting of 33 students, was assigned as the experimental group and received instruction through Project-Based Learning (PjBL). Thus, the total number of participants in this quasi-experimental study was 66 students.

Data Collection Method

To collect the data, a reading test was administered to measure students' reading skills. A test is defined as a set of questions or tasks used to assess individuals' or groups' abilities, knowledge, or skills (Telaumbanua, 2020; Arikunto, 2018). The reading test was designed based on indicators aligned with the learning objectives and the reading materials taught during the intervention.

The research procedure included two instructional treatments and one assessment. The post-test was administered at the end of the instructional period to evaluate students' reading skills after the implementation of the teaching methods. The test instrument was a written examination consisting of multiple-choice and essay questions, with a total of ten items. The test focused on assessing students' comprehension of narrative texts, including their understanding of main ideas, details, vocabulary, and grammatical structures.

Data Analysis Method

This study employed a quantitative approach using a quasi-experimental research design. The collected data were analyzed statistically to determine the effectiveness of Project-Based Learning on students' reading skills. Data analysis procedures included tests of normality

and homogeneity to ensure that the data met the assumptions required for inferential statistics. Subsequently, an independent samples t-test was conducted to compare the reading performance of the control and experimental groups. In addition, a two-way analysis of variance (ANOVA) was used to examine the effects of the instructional method, grammatical competence, and vocabulary mastery on students' reading skills.

RESULTS

Descriptive statistics

The results of the post-test revealed a significant improvement compared to the pre-test scores, as shown in Table 1. This improvement indicates that Project-Based Learning had a positive effect on enhancing students' reading skills. Prior to the implementation of PBL, students' pre-test scores ranged from a minimum of 60 to a maximum of 76, reflecting their initial reading proficiency. After the instructional intervention, the post-test scores increased noticeably, with the minimum score rising to 70 and the maximum score reaching 92. These findings suggest that students demonstrated higher reading achievement after being taught through the PBL approach.

Table 1 Descriptive Statistic of Pre-test and Post-test scores

Descriptive Statistics

	N	Range	Minimum	Maximum	Mean	Std. Deviation
Pre-test experiment	33	16	60	76	68.91	4.304
Post-test experiment	33	22	70	92	78.27	5.730
Pre-test control	33	25	45	70	57.24	6.124
Post-test control	33	30	50	80	66.00	7.628
Valid N (listwise)	33					

Effect of PBL on Reading

To examine whether there was a significant difference in reading skills between students taught using Project-Based Learning and those taught using the traditional method, an independent samples t-test was conducted. The results of this analysis are presented in **Table 2**.

Table 2 the result of independent sample-test

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means							
						Significance				95% Confidence Interval of the Difference	
		F	Sig.	t	df	One-Sided p	Two-Sided p	Mean Difference	Std. Error Difference	Lower	Upper
Hasil Belajar B. Inggris	Equal variances assumed	2.298	.134	-7.390	64	<.001	<.001	-12.273	1.661	-15.590	-8.955
	Equal variances not assumed			-7.390	59.390	<.001	<.001	-12.273	1.661	-15.595	-8.950

The statistical analysis showed that the calculated t-value was −7.390 with a significance (two-tailed) value of 0.001. Since the significance value (0.001) was lower than the predetermined alpha level of 0.05, the null hypothesis (H_0) was rejected and the alternative hypothesis (H_1) was accepted. This result indicates that there was a statistically significant difference in students' reading skills between those taught using Project-Based Learning and those taught using the traditional method. Therefore, Project-Based Learning was proven to have a significant effect on improving students' reading skills.

Intreaction effects of teaching method, grammatical competence, and vocabulary mastery on reading skills

To further investigate the effects of teaching method, grammatical competence, and vocabulary mastery on students' reading skills, a two-way ANOVA was performed. The results are summarized in Table 3.

Table 3 effect of PBL on reading skills

Tests of Between-Subjects Effects

Dependent Variable: Reading Skills

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	2563.934[a]	3	854.645	18.698	<,001
Intercept	325998.976	1	325998.976	7132.353	<,001
Method	2443.973	1	2443.973	53.470	<,001
Aspect	11.488	1	11.488	.251	.618
Method * Aspect	67.219	1	67.219	1.471	.230
Error	2833.838	62	45.707		
Total	348839.000	66			
Corrected Total	5397.773	65			

a. R Squared = .475 (Adjusted R Squared = .450)

The analysis revealed three important findings. First, the significance value for the teaching method was 0.001, which is lower than 0.05. This indicates a significant difference in students' reading skills based on the instructional method used, namely Project-Based Learning and the traditional method. Second, the significance value for the linguistic aspects (grammatical competence and vocabulary mastery) was 0.618, which is higher than 0.05. This result suggests that there was no significant difference in students' reading skills when viewed from grammatical competence and vocabulary mastery. Third, the interaction effect between teaching method and linguistic aspects produced a significance value of 0.230, which is also greater than 0.05. This

indicates that there was no significant interaction between the teaching method and the two linguistic aspects in influencing students' reading skills.

Overall, the statistical findings provide empirical evidence that Project-Based Learning significantly enhances EFL students' reading skills. However, grammatical competence and vocabulary mastery did not show a significant independent or interactive effect on reading achievement within the scope of this study.

DISCUSSION

The findings of this study demonstrate that Project-Based Learning (PBL) had a significant positive effect on EFL students' reading skills. Students in the experimental class became more motivated and actively involved in the learning process, particularly when engaging with narrative texts. This improvement suggests that PBL creates a learning environment that supports students' comprehension by encouraging meaningful engagement with texts. These results align with previous research indicating that project-based approaches enhance reading achievement and language learning outcomes in EFL contexts (Alan & Stoller, 2005; Bytyqi, 2021; Simpson, 2011).

One key factor contributing to the effectiveness of PBL is its interactive and collaborative nature. Within the PBL framework, students participated in group discussions, peer feedback, and collective problem-solving, which required them to analyze texts, share interpretations, and synthesize information. Such collaborative learning experiences mirror authentic literacy practices found in real-world academic and professional settings, thereby increasing students' engagement and motivation (Al-Rawału & Al-Mekhlafi, 2015; Chen et al., 2015). Increased engagement has been shown to lead to deeper learning and improved academic performance, particularly in reading comprehension tasks that require higher-order thinking skills.

The statistical analysis supports these pedagogical observations. The normality and homogeneity tests confirmed that the data met the assumptions required for further inferential analysis. The independent samples t-test revealed a statistically significant improvement in students' reading scores after the implementation of PBL. Specifically, students' scores increased from a pre-test range of 60–76 to a post-test range of 70–92. The paired sample t-test further confirmed that this improvement was statistically significant ($t = -7.390$, $p = 0.001$), indicating that PBL had a substantial impact on students' reading performance. These findings are

consistent with earlier studies showing that PBL enhances reading comprehension by fostering active learning and contextualized language use (Alan & Stoller, 2005; Bytyqi, 2021).

The results of the two-way ANOVA revealed a significant main effect of the teaching method on students' reading skills, confirming that PBL was more effective than the traditional method. However, no significant differences were found when reading outcomes were viewed from grammatical competence and vocabulary mastery, nor was there a significant interaction between instructional method and these linguistic aspects. This finding suggests that PBL benefits students across varying levels of grammatical and vocabulary proficiency. While previous research has emphasized the importance of grammar and vocabulary knowledge in reading comprehension (Nassaji, 2003; Zhang, 2012), the present study indicates that PBL may compensate for linguistic limitations by providing contextual support and collaborative meaning-making opportunities.

This result can be interpreted as evidence that reading development in PBL settings is not solely dependent on isolated linguistic knowledge but is also shaped by instructional design and learning processes. Through project work, students are exposed to texts in meaningful contexts, often supported by peer interaction and learning resources. Such conditions enable students to infer meaning, negotiate understanding, and develop comprehension strategies, even when their grammatical competence or vocabulary mastery is limited (Nassaji, 2003; Alharbi, 2016). This finding also complements studies showing that supportive learning tools and interactive strategies can enhance reading comprehension regardless of learners' initial proficiency levels (Pradnyadewi & Kristiani, 2021).

Overall, the findings of this study highlight the effectiveness of Project-Based Learning in enhancing EFL students' reading skills. By engaging learners in inquiry-based, collaborative, and authentic learning experiences, PBL promotes deeper comprehension, increased motivation, and improved analytical abilities. Although challenges such as time management and the need for teacher preparation remain, the advantages of PBL clearly outweigh its limitations. As demonstrated by the results, PBL represents a dynamic and impactful instructional approach and serves as a valuable pedagogical strategy for improving reading instruction in EFL classrooms.

CONCLUSION

Based on the findings presented in the previous chapters, this study concludes that Project-Based Learning (PBL) has a significant and positive effect on junior high school

students' reading skills when viewed from grammatical competence and vocabulary mastery. The implementation of PBL in the second-grade English class at SMPN 1 Kopang demonstrated that students' reading performance improved after they were taught using project-based instruction.

The application of Project-Based Learning resulted in noticeable improvements in students' reading comprehension. Students actively participated in meaningful learning tasks that involved pre-reading activities, text analysis, and collaborative discussion. These activities enhanced students' ability to understand texts more deeply. Statistical analysis further confirmed the effectiveness of Project-Based Learning. The significant difference between pre-test and post-test scores indicates that PBL had a substantial impact on students' reading skills. Students demonstrated improved abilities in understanding meaning, organizing ideas, interpreting grammatical structures, and comprehending vocabulary within texts.

This study provides empirical evidence that Project-Based Learning is an effective pedagogical strategy for improving EFL students' reading skills at the junior high school level. The findings suggest that PBL can be successfully implemented to enhance students' engagement, comprehension, and overall reading proficiency, particularly in narrative texts, during the 2024/2025 academic year at SMPN 1 Kopang.

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