English Language and Literature in Education Journal (ELLINE Journal)
Vol. 2, No. 2, pp. 1-11, 2024
DOI: https://doi.org/10.63011/a9f0zk04
e-ISSN: 3062-9233
https://elline-journal.com

Project-Based Learning and Writing Skills: A Relationship in Junior High School Students

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Received:	Revised:	Accepted:	Published:
29 June 2024	2 August 2024	4 August 2024	1 October 2024

Abstract. Project-Based Learning (PjBL) effectively integrates students' knowledge, attitudes, and skills, creating a productive and engaging learning environment. This study investigates the influence of PjBL on the writing skills of 9th-grade students at SMP Negeri 44 Surabaya, employing a pre-experimental design with a sample of 40 Grade IX-A students. Statistical analysis revealed a significant enhancement in students' writing skills, with the post-test mean score rising to 85.5 from a pre-test mean score of 72.6, and a Sig. (2-tailed) value of .001. The acceptance of the alternative hypothesis (Ha) and rejection of the null hypothesis (Ho) confirms that PjBL significantly boosts writing proficiency. These findings highlight the potential of PjBL to improve academic performance by fostering active learning and critical thinking. It is recommended that educators integrate PjBL into the curriculum to enhance not only writing skills but also broader academic competencies. Future research should investigate PjBL's effectiveness on other English language skills and its potential to cultivate critical thinking and problem-solving abilities. Furthermore, exploring its application across different educational contexts and age groups could provide a more comprehensive understanding of its benefits and limitations. Adopting PjBL can transform traditional teaching methods, making learning more dynamic and student-centered, ultimately leading to better educational outcomes.

Keywords: junior high school students, project-based learning, writing skills

INTRODUCTION

The advancement of sophisticated technologies compels individuals to tackle increasingly complex tasks, a challenge that extends into education. To keep pace with current trends, educational paradigms must evolve, emphasizing not only the acquisition of knowledge and skills but also the development of competencies that prioritize practical application (Scott, 2015). The concept of 21st-century skills encapsulates these broader capabilities, including cognitive ability, functional skills, interpersonal prowess, and ethical decision-making (Prasetya et al., 2023; Slamet 2024; Widodo & Slamet, 2020, 2021). These competencies are crucial for navigating dynamic environments and addressing intricate problems encountered in daily life. Despite recognition of their importance, there remains a significant gap in integrating these skills effectively within educational frameworks. Slamet et al. (2024a) emphasizes the need for competency-based learning to address contemporary educational challenges. However, existing literature indicates that while various educational initiatives have sought to incorporate 21st-century skills, many have fallen short in practical implementation and assessment (Fatimah et al., 2020; Sabat & Slamet, 2019; Slamet & Sulistyaningsih, 2021; Widodo et al., 2022). Research by Slamet et al. (2024a) and Slamet and Mukminatien (2024) highlights that current pedagogical approaches often lack the depth required to foster these skills comprehensively. There is a need for more empirical studies to explore effective strategies and tools that can seamlessly integrate these competencies into curricula. Addressing these gaps will not only enhance students' adaptability and problem-solving abilities but also better prepare them for future societal and professional demands.

Constructivism, a cornerstone of modern educational theory, underpins the development of 21st-century skills by emphasizing the active role of students in constructing knowledge through contextualized learning experiences (Efgivia et al., 2021). This theory posits that learning occurs most effectively when new information is integrated with students' existing knowledge within an engaging and reflective classroom environment (Lombardo & Kantola, (2021). Research indicates that students who actively participate in their learning process develop deeper understanding and retention of knowledge (Jung, 2019; Slamet et al., 2024b). Central to this approach are the 4C skills: critical thinking, creativity, collaboration, and communication, which are crucial for navigating the complexities of the modern world. Critical thinking enables students to analyze problems from multiple perspectives and devise effective solutions. Creativity fosters innovation and the ability to view challenges through fresh lenses. Collaboration promotes teamwork and the sharing of diverse ideas, while communication skills are essential for articulating thoughts clearly and effectively. Despite the theoretical strengths of constructivism, its practical implementation often faces challenges, such as insufficient teacher training and rigid curricula that do not accommodate flexible, student-centered learning (O'Connor, 2022). Studies by Saleem et al. (2021) reveal gaps in effectively embedding these skills into everyday teaching practices, highlighting the need for more comprehensive pedagogical strategies and professional development for educators. Addressing these shortcomings can enhance the application of constructivist principles, ensuring that students are better equipped to adapt to and thrive in an ever-changing global landscape.

Project-based learning (PjBL) is one of the various teaching and learning models that may be implemented and is founded on the constructivist learning theory. PjBL is a learning model that focuses on activities that seek to develop learning products through project tasks. This definition is the simplest possible explanation of what PjBL is. It is believed to be a method and a way to attain the abilities necessary for the 21st century (Almulla, 2020; Hidayati, 2024; Ngadiso et al., 2021; Slamet & Basthomi, 2024). The idea of the "Four Cs" is widely recognized as an essential component of instruction in the 21st century. Creativity and invention are two of the Four Cs, along with critical thinking and problem solving, communication, and working together with others. Because of its

emphasis on learning, PjBL has the ability to foster the development of the aforementioned abilities. Learners are able to collaborate and gain meaningful and authentic experience through the use of hands-on activities inside PjBL (Hidayati, 2023). The learner is able to develop their language skills and communicative competence, as well as gain confidence, co-operation, creative independence, and self-discipline when they see the language that can be used in their lives and is applicable to the task or need, they are attempting to accomplish. PjBL is an approach to education that eschews rote learning and memorization in favor of developing an individual's strengths while enabling them to explore their interests and capabilities. Students have to go through the process of realizing that they are accountable for their own education (Slamet & Fatimah, 2023; Slamet et al., 2024a; Yuliansyah & Ayu, 2021). The integration of students' knowledge, attitude, and abilities is one of the primary tenets of PjBL, which affords teachers the ability to foster an environment in the classroom that is both productive and entertaining for their students.

Research on the PjBL model in schools has consistently yielded positive outcomes, demonstrating its efficacy in enhancing various student competencies. Arisanti et al. (2016) found that PjBL significantly improves students' understanding of concepts, though its impact on creative thinking, while positive, showed smaller significance, particularly in areas of fluency. Similarly, Sumarni et al. (2016) and Hidayati et al (2023) reported that PjBL enhances students' psychomotor skills, with significant improvements noted in readiness, transition reaction, proficiency, adaptation, and invention. These findings suggest that PjBL not only fosters cognitive and psychomotor development but also supports holistic educational growth. Cifrian et al. (2020) further corroborated these results, indicating that PjBL fosters greater creativity in students, as evidenced by an overall N-gain score of 0.43, categorized as medium improvement. The study highlighted key indicators of creative ability, such as fluidity, adaptability, and originality. Additionally, Meng et al. (2023) demonstrated that integrating PjBL with digital tools like Schoology can enhance students' curiosity, indicating the potential of technology to amplify PjBL's benefits. Despite these promising outcomes, there remain gaps in the literature regarding long-term impacts and the scalability of PjBL across diverse educational settings. Further research is needed to explore these dimensions and develop strategies to overcome challenges such as teacher preparedness and resource allocation. Addressing these issues could solidify PjBL as a cornerstone of modern educational practices, promoting a more engaging and effective learning environment for students.

Not only is it anticipated that the deployment of PjBL would result in more entertaining classrooms for students, but it will also provide opportunities for students to improve their English skills. Writing is one of the talents that need be learned in order to succeed in the English course. Writing is a cognitive domain-based ability that requires learning new information, comprehending that information, applying that information, and synthesising that information (Fatimah et al., 2020; Srinarwati et al., 2023). Writing is not simply about according to the rules of writing; it also involves creative inspiration, problem-solving, reflection, and editing, all of which end in a finished document. Writing can be thought of as an ongoing process that can be approached from two different angles: the product approach and the process approach (Hidayati, 2024; Widodo et al., 2023). One method of teaching writing is known as the product approach, and it requires students to focus solely on analyzing texts in terms of the language that was used and how the texts were built. The evaluation of the actions that go into the creation of written material can be done via the lens of "process writing". Therefore, the process of writing is quite involved, and it is imperative that students develop their skills in it.

The preliminary investigation revealed that the explanation provided by the teacher was the most effective method for pupils to learn the topic. To put it another way, students did not contribute to the project in any way. The students are only marginally involved in the process of learning because the teachers continue to have the primary role in the process of explaining the subject and presenting

the text (Slamet, 2024; Slamet & Mukminatien, 2024; Slamet et al., 2024b). This circumstance provided more evidence that the learning process that took place did not go as planned. In a controlled learning environment, the instructor is typically the only source of information for students, and a textbook serves as the sole instructional resource (Birdman et al., 2022; Hidayati et al., 2023; Slamet et al., 2019). Controlled learning environments are typically characterized by their focus on the role of the teacher in the educational process. In addition, in order for students to develop their ideas, the writing activity that counts as a productive skill requires them to do it on paper. It demonstrates that the exclusive job of instructor is not sufficient. The teachers anticipate significant participation from the students in class discussions and activities. Concerning the possibilities of PjBL as well as the difficulty of writing, there is a need for research to be carried out on this topic. Because of this issue, there is a pressing need to undertake study to investigate the impact that PjBL has on the level of writing ability possessed by students. As a result, the research question was framed as follows: Does participation in PjBL have a substantial effect on the students' writing ability in the ninth grade at SMP Negeri 44 Surabaya?

METHOD

The research utilized a pre-experimental, one-group pretest-posttest design to examine the impact of the PjBL method on students' writing skills. In this design, a single group of participants is assessed before and after the intervention, without a control group for comparison. This approach was selected deliberately to focus on the direct effects of PjBL on the participants. The absence of a control group is a limitation, as it precludes the ability to compare outcomes against a non-intervention group, potentially affecting the robustness of the results. However, the design allows for a concentrated analysis of the intervention's impact within the specific context of the study. The study involved administering a series of pre- and post-tests to 40 ninth-grade students from Class IX-A at SMP Negeri 44 Surabaya during the 2021/2022 academic year. These assessments measured changes in students' writing abilities, providing data on their progress. The decision to use a one-group pretest-posttest design was influenced by the logistical and practical constraints of the educational environment, as well as the specific research focus on PjBL in an English writing class. This method allowed for an intensive examination of the intervention's effects on a consistent group of students, ensuring that all participants experienced the same instructional conditions.

Throughout the study, multiple pre- and post-tests were administered to track students' development over time, providing a detailed view of their learning trajectory. This iterative testing approach aimed to capture incremental changes and offer insights into how PjBL influences writing skills over the course of the intervention. While this design provides valuable data on the immediate impacts of PjBL, future research could benefit from incorporating control groups and longitudinal studies to assess the long-term effectiveness and broader applicability of PjBL across different educational settings. Table 1 outlines the study's organization and procedure, detailing the specific steps taken to implement and evaluate the PjBL method. This comprehensive approach highlights both the strengths and limitations of the chosen design, offering a nuanced understanding of PjBL's role in enhancing writing skills.

Table 1. Research design of the experiential learning (ExL) approach

	Pre-test	**Treatment**	**Post-test**
Experimental Group	E1-IX-A	X	E2-IX-A

Description:
E1-IX-A: Pre-test in experimental group
E2-IX-A: Post-test in experiment group
X: Treatment using the PjBL Approach in face-to-face class

The students' learning capabilities in writing was evaluated using the pre-and post-tests before and after they were exposed to teaching material that was based on experiential learning. In this particular research project of writing, the pre-test and post-test, respectively, were administered to the experimental group. In order to examine the findings of the test, an independent t-test was performed, and the value of t that was produced was compared to the t table. If the t acquired value is more than the t table value, then the hypothesis Ha is accepted; otherwise, the t obtained value is less than the t table value, which rejects Ha (H0 accepted). In addition to data collection from both the pre-test and post-test cycles, descriptive and inferential analyses of the data were performed using the SPSS Statistics 26 software program to ensure a rigorous evaluation of the intervention's effectiveness. This analytical approach was essential for identifying significant changes in writing skills and determining the reliability of the observed improvements, thereby providing a comprehensive assessment of the PjBL method's impact on students' learning outcomes. However, before carrying out a dependent t-test, also known as a paired sample test, to establish whether or not a treatment had a statistically significant effect, it is required to make certain that the data were normally distributed. Only after this step can the dependent t-test be carried out. As a consequence of this, the statistic known as Kolmogorov Smirnov, which can be located in SPSS Statistics 26, is applied to the data in order to ascertain whether or not the data are normal. When the level of significance was higher than 0.05, it was determined that the data followed a normal distribution. In the subsequent step, if the results of the normality test are as expected, the paired sample test can be utilized to make a comparison between the scores obtained during the pre-test and those obtained during the post-test in order to ascertain whether or not the PjBL method was successful in enhancing the students' ability to write English texts in paragraph assigned.

RESULTS AND DISCUSSION

This research aimed to evaluate the effectiveness of the PjBL method in enhancing the writing skills of students at SMP Negeri 44 Surabaya during the 2020/2021 academic year. The study involved a thorough data collection process, followed by comprehensive analysis using SPSS Statistics 26 software. Descriptive statistical methods were employed to compute essential metrics such as mean, standard deviation, minimum, and maximum scores, providing a detailed overview of students' performance before and after the intervention. Inferential statistical analysis was then used to test hypotheses and determine the significance of any observed changes in writing skills, offering insights into the impact of PjBL on student outcomes. This approach was critical for validating the effectiveness of the PjBL method and ensuring that the findings were both accurate and reliable. Table 2 details the results from the descriptive statistical analysis, illustrating the initial and subsequent performance levels of the students and providing a foundation for interpreting the effectiveness of the PjBL intervention.

Table 2. Descriptive analysis results of pretest and posttest

	N	Minimum	Maximum	Mean	Std. Deviation
Pre-test	40	60	76	72.6	4.262
Post-test	40	78	88	85.5	2.682
Valid N (listwise)	40				

As can be seen in Table 2, the mean score on the pre-test was 72.6, whereas the mean score on the post-test was 85.5, showing that the post-test provided more accurate results than the pre-test did. In light of the findings, it was found that there is a difference that is statistically significant between the mean of the group before the treatment and the mean of the group after the treatment using the PjBL approach has been finished. This difference was found between the mean of the group before the treatment and the mean of the group after the treatment. In addition to this, the standard deviation of the pre-test was 4.262, but the standard deviation of the post-test was 2.682. (See Table

2). Following the steps outlined above to assess whether or not the data follow a normal distribution, the next step is to carry out the inferential test, which is also known as the pair sample test. It was not essential to conduct a homogeneity test on them as there was only one group included in the sample. This was due to the fact that there was only one group. In addition, the Kolmogorov-Smirnov test was carried out in order to ascertain whether or not the data were normal. The results of the experiment are detailed in Table 3.

Table 3. The result of Normality Test

Tests	Kolmogorov-Smirnov[a]		
	Statistic	**df.**	**Sig.**
Pre-test	1.48	40	.327
Post-test	1.76	40	.253

As per Table 3, the Sig. value of the pre-test was .327, while the Sig. value of the post-test was .253; both of these values were significantly higher than the Sig. level of .05. The post-Sig. test's value was.156, which was significantly higher than the Sig. level, which was set at.05. In the event that the Sig. value was more than .05, it indicated that the data followed a normal distribution, which is consistent with the findings of (Sugiono, 2015). It is possible to conclude, with the use of a pair sample test, that the data on both the pre-test and the post-test were normally distributed and that the data fulfilled the requirements for hypothesis testing. This is because the pair sample test compares the data to itself. In this particular instance, inferential analysis is carried out by means of a pair sample test because the prerequisite for conducting hypothesis testing has already been satisfied. In order to assess whether or whether the PjBL approach has a statistically significant influence on the students' writing skills, a procedure for testing hypotheses was carried out. The findings of the research are summarized in Table 4 below.

Table 4. The Results of Pair Sample Test

		Mean	**Std. Dev**	**Std. Error Mean**	**95% Confidence Interval**				**Sig. (2tailed)**
					Lower	**Upper**	**t**	**df**	
Pair 1	pretest - posttest	8.676	4.525	1.007	7.088	11.752	6.127	39	.001

On the basis of the information shown in Table 4, one can draw the conclusion that the level of significance for the Sig. value was .001, which was lower than the level of significance of.05. It was determined that the null hypothesis (Ho), which stated "There is no significant effect of the PjBL approach on the students' writing skills", was "rejected", and that the alternative hypothesis (Ha), which stated "There is a significant effect of the PjBL approach on the students' writing skills", was "accepted". Both of these outcomes were based on the findings of the research. The mean, excluding that factor, was 8.676 (St. Dev was 4.525). The PjBL approach was used to the writing abilities of the students, and these findings indicate that the students' writing skills increased as a result of treatment, as demonstrated by these data. On the other hand, one may claim that there was a statistically significant influence that the PjBL technique had on the students' ability to write. Participants in the study were given a post-test once the treatment had been completed. It is feasible to determine the influence that the PjBL strategy has had on the students' writing abilities by comparing the results of the pre-test to the results of the post-test.

In addition, a second analysis was carried out to describe the development of the students' writing in terms of the content, organization, vocabulary, and grammar as well as the mechanics. To begin, in terms of the content, it was discovered that the majority of students demonstrated their growth in articulating the concepts in the form of writing. This can be seen by the increasing number

of sentences contained within the paragraphs that they produced. Second, when it comes to the way the information is organized, it was discovered that the pupils create the sentences in a logical manner. The pupils achieve a satisfactory result in terms of their vocabulary, as evidenced by the fact that they enhance their sentence structure when composing paragraphs. The kids consistently demonstrated strong structure in terms of grammatical usage. Last but not least, the students' writing for the mechanic contained very few instances of incorrect spelling or punctuation. Within the space of around four weeks between the pre-test and the post-test, the writing portion of the test that the students take in the pre-test was altered in the post-test. During the pre-test, the students were given a total of 2x40 minutes to create a paragraph. In the meantime, for the post-test, the students were given a longer amount of time (2X40 minutes) and expected to write as many paragraphs as they could in that amount of time. This was done so that it could be assumed that the students had the opportunity to write creatively and spontaneously. On the other hand, given that the tests consisted of having participants write paragraphs, it is reasonable to believe that the pre-test did not have an impact on the post-test but that the treatment did. To put it another way, there was no way for the students to recall the answers to the pre-test when it came time to take the post-test.

During the implementation of PjBL at SMP Negeri 44 Surabaya, students demonstrated a high level of enthusiasm in response to the teacher's guiding questions, as observed in class activities. This positive reaction aligns with existing research indicating that PjBL fosters critical thinking skills and enhances student engagement (Hidayati et al., 2023; Slamet & Basthomi, 2024; Slamet et al., 2024a). The collaborative nature of PjBL, which often involves group work, significantly boosts classroom interaction and elevates communication as a critical skill, echoing findings from Ngadiso et al. (2021) who noted improvements in psychomotor skills through similar methods. Additionally, PjBL's emphasis on creating tangible learning products allows students to exercise and develop their creative abilities, supporting the idea that hands-on projects can lead to more meaningful learning experiences (Hidayati, 2023; Srinarwati et al., 2023; Slamet et al., 2024b). The present study's results affirm these benefits by showing a notable improvement in students' writing scores post-intervention, underscoring the effectiveness of PjBL in enhancing writing skills. This is consistent with Bas's (2011) research, which highlighted PjBL's positive impact on students' academic achievement. Furthermore, the study revealed a statistically significant difference in attitude scores between the intervention and control groups, highlighting the broader impact of PjBL on students' overall academic engagement. While these findings align with previous research, they also highlight a gap in the literature regarding the long-term effects and scalability of PjBL across diverse educational contexts. Future research should address these areas to provide a more comprehensive understanding of PjBL's effectiveness and its potential for widespread implementation.

The findings of this study align with existing literature on PjBL and its efficacy in enhancing writing skills through naturalistic and contextualized language use. According to Foulger and Jimenez-Silva (2007), PjBL integrates writing into real-world contexts, which fosters higher levels of language cognition. This includes improvements in topic organization, linguistic feature awareness, vocabulary usage, genre principles, and sentence formation. These aspects are critical for developing effective writing skills, as they help students understand and apply writing conventions in meaningful contexts. The study's results support this notion, showing that PjBL enables students to practice writing more extensively, which in turn enhances their academic performance. PjBL's strength lies in its ability to embed writing tasks within natural settings, thereby contextualizing language learning. This approach contrasts with traditional methods that often isolate writing practice from real-world applications. By situating writing within projects that have tangible outcomes, PjBL creates an environment where writing is not just an academic exercise but a tool for communication and problem-solving. This immersive approach aligns with the research of Birdman et al. (2022), who argued that project work creates a natural language learning environment, where writing is interwoven with the goal of communicating about specific themes. Such a setting not only makes the

writing process more relevant but also encourages students to apply their knowledge of writing conventions in practical ways.

The study's findings corroborate this perspective, demonstrating that students who engaged in PjBL showed significant improvements in their writing skills. The emphasis on communication within PjBL helps students focus on effectively conveying their ideas while adhering to writing conventions. This practical application of writing skills allows students to see the direct impact of their work, which can be motivating and reinforce learning. The PjBL framework encourages students to refine their writing through iterative practice, feedback, and revision, which is essential for mastering complex writing skills. Furthermore, the study's results reveal that PjBL supports a more holistic development of writing abilities compared to traditional methods. By involving students in projects that require research, collaboration, and presentation, PjBL not only improves writing but also enhances critical thinking, problem-solving, and communication skills. These findings are consistent with those of Chen and Yang (2019) and Hidayati et al (2023), who found that PjBL positively impacts various aspects of student learning, including cognitive and psychomotor skills. However, while the study confirms the benefits of PjBL, it also highlights some gaps in the literature. For instance, there is limited research on the long-term effects of PjBL on writing skills and how these skills transfer to other academic and real-world contexts. Additionally, the scalability of PjBL across different educational settings and subjects remains underexplored. Future research should address these gaps by examining the sustained impact of PjBL on writing proficiency and its effectiveness in diverse learning environments (Cifrian et al., 2020). Investigating these areas will provide a more comprehensive understanding of PjBL's potential and its adaptability to various educational contexts.

Overall, the study reinforces the idea that PjBL enhances writing skills by embedding tasks in authentic contexts and emphasizing communication. This approach aligns with previous research, which supports the integration of writing into meaningful projects to foster deeper learning and skill development. By continuing to explore the long-term effects and broader applicability of PjBL, educators can better understand its potential to improve writing instruction and overall student achievement.

CONCLUSION

This study provides robust empirical evidence supporting the efficacy of PjBL in significantly enhancing English writing skills among junior high school students at SMP Negeri 44 Surabaya. The research demonstrates that PjBL fosters active student engagement, which is crucial for developing writing abilities as part of the broader spectrum of productive skills. The evidence suggests that incorporating PjBL into writing instruction not only improves students' writing proficiency but also promotes essential 21st-century skills, such as creativity, communication, and collaboration. This aligns with prior research highlighting PjBL's benefits in fostering deeper learning and skill development. The findings indicate that students who participated in PjBL exhibited enhanced creativity, improved communication, and better collaboration within the classroom. These outcomes support the integration of PjBL as a valuable pedagogical strategy for writing instruction. However, it is essential to note that while these three skills showed improvement, critical thinking skills, which are integral to the PjBL approach, exhibited variations that warrant further investigation. Critical thinking, often considered a cornerstone of effective problem-solving and decision-making, may require more targeted interventions to fully integrate it within the PjBL framework. The study also identifies several limitations. The research was confined by a relatively small sample size and a limited scope of instructional coverage. These constraints may affect the generalizability of the findings. To address these limitations, future research should replicate the study with a larger and more diverse sample, employing advanced research methodologies to validate and extend the

findings. Expanding the scope of instruction and including a control group could provide a more comprehensive understanding of PjBL's impact and its applicability across different educational contexts. Additionally, future studies should focus on the long-term effects of PjBL on writing skills and other academic outcomes. Investigating how PjBL influences critical thinking and its transfer to other areas of learning can provide deeper insights into its effectiveness. Furthermore, exploring how PjBL can be adapted to various subject areas and educational levels will enhance its applicability and effectiveness as a teaching strategy.

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