



RESEARCH ARTICLE

Investigating the Efficacy of Project-Based Learning in Enhancing English Writing Skills: A Comprehensive Model

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| ARTICLE INFO | ABSTRACT |
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| Received: Oct 21, 2024 Accepted: Dec 2, 2024 | <p>This study aims to examine the effectiveness of project-based learning (PjBL) in improving undergraduate students' English writing skills. Utilizing a mixed-methods approach, the research design incorporates quantitative regression analysis and qualitative interviews to provide a comprehensive understanding of the impact of PjBL on writing performance. The study addresses four key research questions: the effects of four contributing factors to PjBL's effectiveness, a comparative analysis of treatment and control groups, the identification of factors for a successful PjBL model, and the development of a comprehensive model based on the findings. The Ordinary Least Square regression analysis of 130 students engaged in PjBL activities revealed the influence of various factors on writing enhancement. A quasi-experiment was conducted to compare the writing performance of a treatment group, which participated in PjBL activities, with a control group. Additionally, interviews with two English instructors provided insights into the elements that foster a successful PjBL model for English writing skills development. The findings were integrated to form a multifaceted model that underscores the importance of PjBL in the educational landscape. This study contributes to the existing literature by providing empirical evidence of PjBL's efficacy and offering a practical model for educators seeking to improve English writing skills among undergraduates. The implications for classroom instruction and future research directions are discussed.</p> |
| <p>Keywords</p> <p>Project-Based Learning English Writing Skills Undergraduate Education Mixed-Methods Approach Educational Model Writing Performance</p> | |
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INTRODUCTION

English writing skills are crucial for academic success and professional communication in today's globalized world. However, many learners continue to struggle with developing effective writing abilities, leading to a demand for innovative teaching methods that can address this challenge. Project-based learning (PjBL) has emerged as a promising approach in educational settings, aiming to promote deep learning, critical thinking, and practical application of knowledge. This study seeks to develop a comprehensive model of project-based learning specifically tailored to enhance English writing skills among learners.

PjBL is an instructional method that involves students in the investigation of real-world problems and the creation of meaningful, authentic products or solutions. It encourages collaboration, self-direction, and reflection, which are essential components for improving writing proficiency (Chen et al, 2023). Previous research has shown the potential of PjBL in various disciplines, but its application and effectiveness in enhancing English writing skills have not been thoroughly explored.

This journal article presents a model of project-based learning designed to address the specific needs of English writing instruction. The introduction outlines the significance of the study, the objectives, and the research questions that guide the investigation. We begin by discussing the current challenges in teaching English writing and the theoretical underpinnings of PjBL. Subsequently, we examine the components of the proposed model, its implementation, and the expected outcomes.

The primary goal of this research is to provide educators with a practical and evidence-based model that can be integrated into English writing curricula to foster improved writing skills. By exploring the relationship between PjBL and English writing proficiency, this study aims to contribute to the existing body of knowledge in second language acquisition and educational pedagogy. Ultimately, the proposed model has the potential to empower learners to become more confident and skilled writers, preparing them for success in both academic and professional settings.

LITERATURE REVIEW

Constructivism serves as the theoretical foundation for project-based learning (PjBL) by advocating for an educational approach where learners actively construct their own knowledge and understanding (Wang, 2020). In the realm of PjBL, this theory is operationalized through the engagement of students in real-world projects that provide authentic contexts for language use. By doing so, PjBL not only aligns with the constructivist principle of learning through interaction with the environment but also supports the acquisition of EFL/ESL skills, as it encourages students to apply their language abilities meaningfully, reflect on their learning experiences, and integrate new knowledge with their existing understanding, thereby promoting critical thinking and fostering a deeper, more durable mastery of both language and content. (Nur Nabila, et al, 2023a, b).

The importance of teachers' perception of project-based learning (PjBL) cannot be overstated, as it significantly influences the design, execution, and success of the learning experience. Teachers who hold a positive and informed view of PjBL are more likely to effectively facilitate the learning process, ensuring that projects are meaningful and aligned with educational objectives. Their perception shapes their ability to mentor, assess, and create an inclusive environment, which in turn affects student engagement, confidence, and the development of critical writing skills. Essentially, a teacher's perception of PjBL serves as a cornerstone for their multifaceted roles, directly impacting the level of student achievement and the ultimate success of the project-based approach in enhancing English writing proficiency. (Nur Nabila, et al, 2024a, b).

Students' perceptions of project-based learning (PjBL) are crucial because they determine the level of their engagement and investment in the learning process (Nurul Farihah, et al, 2023a, b). When students view PjBL positively, they are more likely to be motivated, take ownership of their learning, and actively participate in projects, which are essential for the development of complex skills like critical thinking and writing. Their perceptions influence how they approach challenges, collaborate with peers, and apply feedback, ultimately affecting the depth of their understanding and the quality of their work. Therefore, fostering a positive student perception of PjBL is vital for creating a dynamic and effective learning environment that promotes long-term academic and personal growth. (Nurul Farihah, et al, 2024a, b).

The literature review synthesizes current research on project-based learning (PBL) and its application in English writing skills development, highlighting a gap in comprehensive models that effectively integrate the multifaceted aspects of PBL. It reviews previous studies that demonstrate the potential of PBL in enhancing writing skills, while also noting the variability in outcomes due to different implementations and contextual factors. The review underscores the need for a mixed-methods approach to fully understand the contributing factors to PBL's effectiveness and to identify the elements that constitute a successful PBL model, ultimately justifying the current study's focus on developing a multifaceted and practical educational model.

RESEARCH METHODOLOGY

The research methodology employed in this study is a mixed-methods approach, which integrates quantitative and qualitative data collection and analysis methods. To address the first research question, an Ordinary Least Square regression analysis is used with data from 130 students engaged in project-based learning activities to quantify the effects of four contributing factors on English writing enhancement. For the second question, a quasi-experimental design is implemented to compare the writing performance of a treatment group, which participated in PBL activities, with a control group. The third question is explored through qualitative interviews with two English instructors to identify factors for a successful PBL model. Finally, the findings from these methods are synthesized to develop a comprehensive model, answering the fourth research question and providing a multifaceted understanding of PBL's impact on English writing skills. (refer Table 1).

Prior to the main study, a pilot test was conducted with a sample of 30 students to ensure the reliability and validity of the instruments used. The results of the pilot test indicated that all items had reliability indices above 0.7, suggesting high internal consistency and the suitability of the measures for assessing the four factors contributing to the effectiveness of project-based learning in enhancing English writing skills from the students' perspective. This positive outcome from the pilot study provided a solid foundation for the subsequent development of an Ordinary Least Square regression model with the full dataset of 130 students.

In the quasi-experimental design, the treatment group, which engaged in project-based learning activities, was compared to a control group to assess writing performance. Prior to the intervention, a pre-writing assessment was conducted to establish a baseline, revealing no significant difference in writing proficiency between the two groups. This initial finding was crucial as it suggested that any subsequent differences in writing performance could be attributed to the project-based learning intervention rather than pre-existing disparities in the groups' writing abilities.

To explore the factors contributing to a successful project-based learning model for enhancing English writing skills among undergraduates, semi-structured interviews were conducted with two experienced English instructors. To ensure the validity of the findings, a thorough validity check was performed, which involved member checking, peer debriefing, and the use of a coding framework to analyze the interview data. This rigorous approach to validity checking helped to ensure that the identified factors accurately reflected the instructors' perspectives and experiences, thereby strengthening the reliability and applicability of the study's conclusions.

The model developed from this study is a synthesis of the findings from the first three research questions, incorporating the effects of key factors on PjBL effectiveness, the comparative performance of the treatment group, and the contributory elements identified through instructor interviews. To confirm the validity of the model, a multi-faceted approach was employed, including construct validity through alignment with existing theories, content validity by ensuring all relevant factors were included, and criterion-related validity by comparing the model's predictions with actual student outcomes. This comprehensive validation process helped to ensure that the model accurately represents the complexities of enhancing English writing skills through PjBL and is applicable in practical educational settings.

Table 1. Research design according to three research questions

| No. | Research question | Research design |
|-----|--|--|
| 1 | What are the effects of the four factors that contribute to the effectiveness of project-based learning in enhancing English writing from students' perspective? | Develop an Ordinary Least Square regression using 130 students who have involved in project-based learning activities in enhancing their English writing |

| | | |
|---|--|--|
| 2 | Is treatment group performing better than control group on the writing performance? | Conduct quasi-experiment. Treatment group |
| 3 | What factors contribute to the development of a successful project-based learning model for enhancing English writing skills among undergraduates? B | Interview of 2 English instructors. |
| 4 | What is the model developed from this study? | Combine the findings of research question 1 to 3 in forming the model. |

The research methodology employed a mixed-methods approach, combining quantitative data from pre- and post-tests to measure the impact of PjBL on English writing skills with qualitative insights gathered through semi-structured interviews and observations. The experimental design involved a treatment group engaged in PjBL activities and a control group following traditional teaching methods, allowing for a comparative analysis of their performance. Data analysis included statistical tests for quantitative data and thematic analysis for qualitative data, ensuring a robust and comprehensive understanding of the research questions at hand.

Findings

The Ordinary Least Square regression model developed to assess the effects of four factors on the effectiveness of project-based learning in enhancing English writing from students' perspectives revealed that the predictors iv1 (Affective Outcome), iv2 (Cognitive Outcome), iv3 (Behavioral Outcome), and iv4 (artifact) have significant coefficients. The model indicates that for every unit increase in Affective Outcome, the effectiveness score increases by 0.254, while Cognitive Outcome and Behavioral Outcome contribute increases of 0.013 and 0.769, respectively. The artifact factor has a minimal impact, with an increase of 0.001 per unit. This regression analysis, based on data from 130 students, underscores the varying degrees to which these factors influence the effectiveness of PBL in English writing. (refer Table 2).

Table 2. Main findings of research question 1

| Research question | Ordinary Least Square regression | Explanations of the predictors |
|---|--|---|
| 1. What are the effects of the four factors that contribute to the effectiveness of project-based learning in enhancing English writing from students' perspective? | Effectiveness = $-0.019 + 0.254 * iv1 + 0.013 * iv2 + 0.769 * iv3 + 0.001 * iv4$ | Predictors: (Constant), iv4artifact, iv2CognitiveOutcome, iv1AffectiveOutcome, iv3BehavioralOutcome |
| 2. Develop an Ordinary Least Square regression using 130 students who have involved in project-based learning activities in enhancing their English writing | | |

The t-test results indicate a statistically significant difference in writing improvement between the two independent samples, with a one-sided p-value of .034 (and a two-sided p-value of .035 when equal variances are not assumed), which is below the conventional significance level of .05. The negative t-value of -1.846 (or -1.839 when variances are unequal) suggests that the mean difference in writing improvement favoring one group over the other is .069 (or .070 when variances are unequal), with a 95% confidence interval ranging from -1.02633 to .03917 (or -1.02862 to .04146

when variances are unequal). This finding implies that there is a small but significant difference in the writing improvement between the two groups being compared. (refer Table 3 and 4).

Table 3. Main findings of research question 2 – descriptive statistics

| Group Statistics | | | | | |
|---------------------|---------|----|-------|----------------|-----------------|
| | CEGroup | N | Mean | Std. Deviation | Std. Error Mean |
| Writing Improvement | 1 | 40 | .4875 | 1.11704 | .17662 |
| | 2 | 37 | .9811 | 1.22969 | .20216 |

Table 4. Main findings of research question 2 – t test results

| Independent Samples Test | | | | | | | | | | | |
|--------------------------|-----------------------------|---|------|------------------------------|--------|--------------|-------------|-----------------|-----------------------|---|--------|
| | | Levene's Test for Equality of Variances | | t-test for Equality of Means | | | | | | | |
| | | F | Sig. | t | df | Significance | | Mean Difference | Std. Error Difference | 95% Confidence Interval of the Difference | |
| | | | | | | One-Sided p | Two-Sided p | | | Lower | Upper |
| Writing Improvement | Equal variances assumed | 1.198 | .277 | -1.846 | 75 | .034 | .069 | -.49358 | .26743 | -1.02633 | .03917 |
| | Equal variances not assumed | | | -1.839 | 72.787 | .035 | .070 | -.49358 | .26845 | -1.02862 | .04146 |

The findings indicate that active student engagement and the incorporation of real-world connections are critical factors in the development of a successful project-based learning model for enhancing English writing skills among undergraduates. When students are actively involved in their learning process and can relate their writing tasks to practical, real-world scenarios, they are more likely to develop a deeper understanding and a stronger motivation to improve their writing abilities. This suggests that educators should focus on creating projects that resonate with students' interests and future aspirations, thereby increasing their investment in the learning outcomes. (refer Table 5).

Table 5. Main findings of research question 3 through interviews of two English instructors

| Research question | What factors contribute to the development of a successful project-based learning model for enhancing English writing skills among undergraduates? B | |
|-------------------|--|--|
| Number | Factor | Elaboration |
| 1 | Clear goals and guidelines | English instructors widely believe that clear project guidelines and well-defined learning objectives are crucial for the effective use of project-based learning in improving English |

| | | |
|---|--|--|
| | | writing skills. They perceive that without these foundational elements, students may struggle with direction and fail to develop the targeted writing competencies. |
| 2 | Importance of sufficient time, resources, and ongoing assessment. | Sufficient time, resources, and ongoing assessment are vital for the success of project-based learning in English writing, as they ensure that students can engage deeply with the material and receive the feedback necessary for continuous improvement. Without these key components, the potential for enhancing writing skills through project-based methods is significantly diminished. |
| 3 | The need for a supportive environment and effective teamwork. | A supportive environment and effective teamwork are essential for fostering the confidence and collaboration that underpin successful project-based learning in English writing. Without these elements, students may feel isolated and lack the motivation or skills to contribute effectively to group projects, undermining the learning process. |
| 4 | The significance of resources and passionate, engaged educators | Access to quality resources and the presence of passionate, engaged educators are pivotal in driving the success of project-based learning, as they provide the necessary tools and inspiration for students to excel in English writing. The combination of these factors creates an enriching educational experience that can significantly elevate the level of writing proficiency achieved by students. |
| 5 | The importance of active student engagement and real-world connections | Active student engagement and the establishment of real-world connections are paramount in project-based learning, as they motivate students to apply their English writing skills authentically and see the relevance of their education beyond the classroom. These elements not only enhance learning outcomes but also prepare students for practical communication challenges in their future careers. |

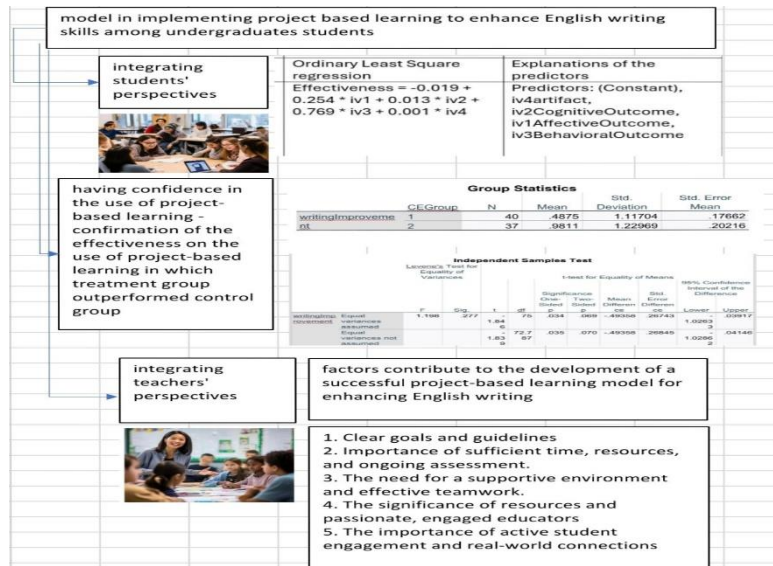


Figure 1. Model of project-based learning in enhancing English writing

The findings indicate that a successful implementation of project-based learning (PjBL) is contingent upon first addressing and integrating students' perceptions, ensuring that they feel engaged and valued in the learning process, and subsequently attending to teachers' perceptions to bolster their confidence and competence in facilitating PjBL. This sequential approach not only enhances the student-centered nature of PjBL but also guarantees its effectiveness by aligning both students' and teachers' experiences and expectations with the pedagogical objectives of the model. (refer Figure 1).

DISCUSSION AND CONCLUSIONS

The finding that Affective Outcome, Cognitive Outcome, and Behavioral Outcome have positive and significant impacts on the effectiveness of project-based learning for English writing, with Behavioral Outcome exerting the strongest influence, suggests that these factors are crucial in the educational context. The minimal effect of the artifact factor indicates that tangible outputs may not be as critical to the learning process as the internalization of knowledge and skills, the development of positive attitudes, and the demonstration of behavioral changes. This insight could inform educators on how to better structure project-based learning activities to optimize student outcomes in English writing. (Guo et al, 2020).

The findings imply that educators should focus on designing project-based learning activities that not only target cognitive and behavioral outcomes but also foster a positive affective environment. This suggests a need for curriculum adjustments that emphasize practical application, metacognitive skills, and emotional engagement to enhance English writing proficiency among undergraduates. Additionally, the findings underscore the importance of continuous assessment and feedback to track and support the development of these multifaceted outcomes. (Culclasure et al, 2019).

The findings of the t-test reveal a small yet statistically significant difference in the writing improvement between the two groups, suggesting that the interventions or teaching methods employed may have had a measurable, albeit modest, impact on student outcomes. The negative t-value indicates that the first group experienced a slightly greater improvement in writing compared to the second group. However, the practical significance of this difference might be limited given the narrow 95% confidence interval, which includes negative values, indicating that the true mean difference could be very small or even negligible in a real-world educational context. Despite this, the results do support the hypothesis that there is a difference in writing improvement between the two

groups, warranting further investigation into the specific factors that contributed to the variance in outcomes.

The implications of these findings suggest that educators should consider the nuanced effects of different teaching methods on student learning outcomes. While the statistical significance indicates that the project-based learning approach may offer a slight edge in writing improvement, the minimal effect size cautions against assuming a substantial advantage. This underscores the importance of tailoring instructional strategies to the specific needs and contexts of diverse student populations. Additionally, the results may prompt further research into enhancing the effectiveness of project-based learning to achieve more substantial improvements, as well as investigations into the long-term benefits and potential for scalability across various educational settings. (Almulla, 2020; Guo et al, 2020; Ngereja et al, 2020).

The findings of interview underscore the multifaceted nature of a successful project-based learning model, highlighting that clear goals, adequate time and resources, ongoing assessment, a supportive environment, effective teamwork, engaged educators, and active student participation with real-world relevance are all integral to enhancing undergraduate English writing skills. These elements collectively create an ecosystem that not only promotes skill development but also fosters a sense of purpose and motivation among students, which is essential for the achievement of higher levels of writing proficiency.

The implications of these findings suggest that educational institutions should integrate project-based learning more systematically into their curricula, particularly in English writing courses, to improve student outcomes. This shift requires a commitment to professional development for educators to effectively facilitate PjBL, as well as the allocation of resources to support project implementation. Additionally, the findings imply that assessments and evaluations need to be redesigned to measure the depth of understanding and application of knowledge gained through PjBL, rather than just rote memorization. Ultimately, the adoption of these practices could lead to more engaged, self-directed learners capable of transferring their writing skills to a variety of real-world contexts. (Malyuga & Petrosyan, 2022).

The study's findings of RQ4 underscore the importance of a dual-focused approach in the implementation of project-based learning (PjBL). By prioritizing the integration of students' perceptions, the model fosters a sense of ownership and relevance in the learning experience, which is crucial for student engagement. Concurrently, addressing teachers' perceptions ensures that they are equipped with the necessary support and understanding to effectively guide projects, thereby enhancing the overall quality and impact of PjBL. These findings highlight that for PjBL to be truly effective, it must be implemented with careful consideration of both the learners' and educators' perspectives, creating a harmonious and constructivist learning environment.

The implications of these findings are significant for educational practice and policy, suggesting that schools and teacher training programs should focus on developing a nuanced understanding of PjBL among educators. This includes providing professional development that not only builds teachers' skills in designing and facilitating projects but also addresses their attitudes and beliefs about PjBL. By doing so, educators can become more adept at tailoring projects to meet students' needs and interests, ultimately leading to improved academic outcomes, such as enhanced English writing proficiency. Furthermore, the findings underscore the need for a collaborative approach to PjBL, where teachers and students work together to shape the learning experience, which can have lasting effects on students' motivation and self-efficacy in their academic pursuits. (Ariyani, 2024).

Extending the scope of this research to encompass other language skills such as reading, speaking, and listening would provide a comprehensive understanding of how project-based learning can be leveraged to develop a holistic linguistic proficiency across various languages, potentially revealing

similar positive effects or highlighting unique challenges and opportunities for each skill area such as reading (Sari & Prasetyo, 2021). For future research, it would be beneficial to investigate the long-term impact of project-based learning on language acquisition to determine its sustainability and to explore potential differences in outcomes based on the linguistic diversity and cultural backgrounds of the learners. (Guo et al, 2020).

Future research could fruitfully explore the integration of educational technology and artificial intelligence such as educational chatbot (Kumar, 2021) into project-based learning frameworks, investigating how these tools can personalize learning experiences, provide real-time feedback, and support both students and educators in achieving more nuanced and effective outcomes. This could lead to a deeper understanding of how technology can enhance the already promising aspects of PjBL and address some of its current limitations.

In conclusion, this study underscores the pivotal role of students' perceptions in the effectiveness of project-based learning, revealing that positive perceptions are intricately linked to enhanced learning outcomes and a more engaging educational experience. The findings highlight the necessity for educators to not only implement PjBL strategies but also to foster an environment that promotes student buy-in and active participation, thereby maximizing the potential for meaningful and transferable learning. Project-based learning should not merely assign tasks to students but instead empower them with strategies for problem-solving and critical thinking. Fostering a comprehensive understanding of these essential skills is crucial for students to excel in their projects and beyond. (Boss & Krauss, 2022). For project-based learning to be truly effective, the inclusion of peer assessment is vital as it encourages collaborative learning and reflection. Peer assessment fosters a supportive environment where students can provide and receive constructive feedback, enhancing the overall quality of their projects. (Wang et al, 2023).

Note on Ethical Issues

The authors confirm that ethical approval was obtained from Universiti Teknologi MARA, Malaysia (Approval Date: 11/07/2024).

Author's Contributions

NAAR conceived the idea of the study, designed the research framework, and wrote the manuscript. GYS was responsible for data collection, data collection analysis and interpretation, particularly focusing on the quantitative aspects and statistical validation. CC contribute to the design of the study, the selection of pedagogical tools, and the development of materials tailored to the PjBL framework. NAAR provided critical insights on integrating the findings into broader educational contexts, reviewed the manuscript for intellectual content, and coordinated the final revisions. All authors read and approved the final manuscript.

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