

## Effectiveness of the Project-Based Learning Model on High School Students' Argumentative Essay Writing Skills

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### Abstract

*This study aims to examine the effectiveness of the Project-Based Learning (PjBL) model in improving the argumentative essay writing skills of senior high school (SMA) students. Argumentative essay writing is a critical competency in Indonesian language learning, involving the ability to think critically, construct logical arguments, and systematically communicate ideas. The research method used was a quasi-experimental design with a pretest-posttest control group. The research subjects consisted of two 11th-grade classes in a public high school, assigned as the experimental and control groups. The instrument used was an argumentative essay assessment rubric including indicators of structure, cohesion-coherence, argumentation, and language use. The results showed a significant difference in the average essay writing scores between the experimental and control groups after the treatment. The PjBL model proved effective in enhancing students' argumentative writing skills through active involvement, collaborative work, and the completion of real-world project-based tasks. These findings recommend the implementation of the PjBL model in writing instruction as an innovative alternative relevant to 21st-century learning needs.*

**Keywords:** Project-Based Learning, argumentative essay writing, writing skills, Indonesian language learning, high school

## INTRODUCTION

Argumentative essay writing is a high-level thinking skill essential in 21st-century education. It requires not only linguistic competence but also the ability to think critically, logically, and systematically when presenting ideas and defending arguments with evidence. Unfortunately, various studies indicate that Indonesian high school students still struggle with argumentative writing, especially in terms of structure, cohesion, coherence, and depth of arguments (Sundari & Febriyanti, 2021). This issue is critical as weak writing skills affect overall literacy, including students' academic and communication abilities.

One key factor contributing to poor argumentative writing skills is the continued use of conventional teaching methods that fail to encourage active engagement and reflective thinking. In this context, the Project-Based Learning (PjBL) model offers a potentially more effective alternative. PjBL emphasizes student engagement in solving real-life, meaningful projects, encouraging critical, collaborative, and

reflective thinking (Thomas, 2000; Bell, 2010). With this approach, students don't just write mechanically—they understand the context and rationale behind the arguments they construct.

Several previous studies have explored the application of PjBL in Indonesian language and writing instruction. For instance, Suardana et al. (2019) found that PjBL improved narrative writing skills. However, few studies have specifically examined the effectiveness of PjBL on argumentative essay writing skills, which have distinct characteristics requiring a different approach. Moreover, limited research has been conducted in Indonesian high school contexts under the new curriculum, which emphasizes literacy and critical thinking skills.

This study is important as it seeks to address the gap in argumentative writing instruction by systematically utilizing the PjBL model. Through project-based learning oriented toward solving real problems, students are expected to develop deeper critical and argumentative thinking skills. This study also contributes both theoretically and practically: theoretically, it enriches research on the effectiveness of PjBL in developing argumentative writing; practically, it serves as a reference for teachers to design more contextual and meaningful writing instruction aligned with the Merdeka Belajar curriculum.

Thus, this study not only addresses the issue of low argumentative writing skills among high school students but also contributes to the development of more innovative, participatory, and 21st-century-oriented Indonesian language teaching strategies.

## **METHOD**

This research employed a quantitative approach with a quasi-experimental design. This design allows for controlled measurement of the influence of the Project-Based Learning (PjBL) model on argumentative essay writing skills, even without full randomization of subjects (Fraenkel, Wallen, & Hyun, 2012; Sugiyono, 2018). The design used was the Nonequivalent Control Group Design, comparing an experimental group receiving the PjBL treatment and a control group taught with conventional methods.

### **Research Subjects**

The subjects were 11th-grade students at a public high school in Bojonegoro, selected purposively based on the following criteria: (1) the school implements the Merdeka Curriculum; (2) the Indonesian language teacher agrees to apply the PjBL model; and (3) two parallel classes with relatively equal academic abilities. Class XI IPA 1 was designated as the experimental group, and XI IPA 2 as the control group, each with 32 students (Arikunto, 2010).

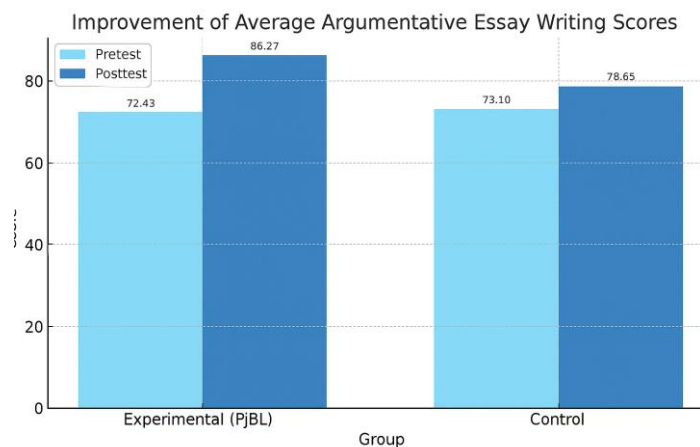
### Data Collection Techniques

Data were collected using argumentative essay writing tests administered before and after treatment (pre-test and post-test). The test was designed based on indicators of argumentative writing skills including: (1) essay structure (thesis, argumentation, restatement), (2) paragraph cohesion and coherence, (3) strength of arguments and use of supporting data, and (4) accuracy of language use (Nurgiyantoro, 2010; Weigle, 2002). Content validity was ensured through expert consultation, and reliability was tested using interrater reliability between two independent raters (Creswell, 2014).

### Data Analysis Procedure

Pre-test and post-test results were analyzed quantitatively using t-tests (independent and paired samples) with SPSS. The analysis tested the significance of learning outcomes before and after treatment and compared the effectiveness between the experimental and control groups (Sugiyono, 2018). Prior to the t-tests, normality and homogeneity assumptions were tested. The results determined whether the PjBL model significantly influenced the improvement of students' argumentative writing skills. The PjBL approach is widely supported in the literature as a contextual learning strategy that fosters active involvement and 21st-century skills development, including critical and argumentative thinking (Bell, 2010; Thomas, 2000).

Figure 1. Graph of Average Improvement in Argumentative Essay Writing Scores



## RESULTS AND DISCUSSION

## Research Findings

This study aimed to examine the effectiveness of the Project-Based Learning (PjBL) model in improving high school students' argumentative essay writing skills. Data collection was conducted using pre-tests and post-tests on two groups: the experimental group (using PjBL) and the control group (using conventional instruction).

**Table 1. Comparison of Pretest and Posttest Mean Scores**

Group	N	Pretest (M±SD)	Posttest (M±SD)	Δ Score	p-value
Experimental	30	72.43 ± 5.78	86.27 ± 4.91	13.84	0.000**
Control	30	73.10 ± 6.02	78.65 ± 5.54	5.55	0.017*

*Note:*

\*) Significant at  $\alpha = 0.05$

\*\*) Highly significant at  $\alpha = 0.01$

The table shows both groups improved, but the experimental group's increase ( $\Delta = 13.84$ ) was significantly greater than that of the control group ( $\Delta = 5.55$ ). T-test results showed statistically significant differences, particularly in the experimental group ( $p < 0.01$ ), indicating that the PjBL model significantly impacted students' argumentative writing skills.

## Discussion

This study reinforces the effectiveness of Project-Based Learning (PjBL) as a teaching strategy capable of developing students' critical and argumentative thinking skills. The significant improvement observed in the experimental group indicates that an approach requiring active student engagement through real-life projects can encourage them to write with more logical structure, data-based reasoning, and strong argumentative flow.

These findings are consistent with previous research by Astuti (2022), which stated that PjBL encourages students to write more reflectively and systematically, as project-based learning provides richer contextual learning experiences. Furthermore, according to Bruning et al. (2011), writing skills improve significantly when students engage in collaborative activities and real-world problem-solving, as facilitated by the PjBL model.

From the perspective of constructivist learning theory (Vygotsky, 1978), project-based learning allows for the formation of social scaffolding in constructing meaning and ideas throughout the writing process—through group discussions and repeated revisions. This element is often absent in conventional lecture-based instruction, which tends to be more passive.

Moreover, the analysis of student essays from the experimental group reveals significant development in the aspects of argumentative structure, use of supporting evidence, and paragraph cohesion. These findings indicate that the PjBL approach not only improves scores quantitatively but also enhances the substantive quality of students' writing.

From a theoretical standpoint, this research supports the process-based writing model and strengthens the integrative concept between project-based learning and critical literacy skills. The findings open opportunities for modifying argumentative writing approaches by incorporating project elements as a stimulus for deeper thinking.

The practical implications of this research are highly relevant for Indonesian language teachers. The PjBL model can be adapted into curriculum and lesson plans (RPP) while aligning with local contexts and learning objectives. Institutionally, this approach may support students' literacy competency achievements in response to 21st-century literacy challenges.

## **CONCLUSION**

These findings reinforce the effectiveness of Project-Based Learning as a strategy for developing critical and argumentative thinking. The significant improvement in the experimental group shows that active engagement through real-world projects encouraged students to write with stronger structure, evidence-based content, and coherent argumentation.

This aligns with Astuti (2022), who found that PjBL encouraged more reflective and systematic student writing due to the richer contextual experiences. Furthermore, Bruning et al. (2011) emphasized that writing skills significantly improve when students engage in collaborative, real-world problem-solving tasks as enabled by PjBL.

From a constructivist learning theory perspective (Vygotsky, 1978), project-based learning enables social scaffolding in building meaning and ideas during writing processes, through group

discussions and iterative revisions. This is absent in more passive, lecture-based conventional teaching.

In-depth analysis of the experimental group's essays showed significant improvements in structure, supporting evidence, and paragraph cohesion. These findings indicate that PjBL not only improves scores but also substantively enhances writing quality.

Theoretically, the study supports process-based writing and the integration of project-based learning with critical literacy skills. It opens opportunities to modify argumentative writing approaches by incorporating real-world projects as cognitive triggers.

Practically, these findings are valuable for Indonesian language teachers. The PjBL model can be adapted into lesson plans and curricula, adjusted to local contexts and learning outcomes. Institutionally, this approach can support students' literacy skill development to meet 21st-century challenges.

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