

# The Effect of Project-Based Learning (PBL) on the Ability to Write Argumentative Texts in Grade XI Students at SMK Koperasi Pontianak

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## Abstract

The ability to write argumentative texts is one of the important competencies that students must master in learning the Indonesian language. Through this skill, students are expected to be able to convey opinions, compose logical arguments, and develop a critical attitude towards various social phenomena in their surroundings. Even so, many students still experience difficulties in organizing coherent writing structures, selecting appropriate supporting data, and concluding ideas convincingly. This situation demands innovative learning models that can develop students' critical thinking skills as well as collaborative skills. The purpose of this study is to analyze the effect of implementing the Project Based Learning model on the ability to write argumentative texts of eleventh grade students at Koperasi Pontianak Vocational School. The method used is an experiment with a One Group Pretest-Posttest design. The research sample consists of 28 students selected through simple random sampling technique. The instrument is in the form of argumentative text writing tests given before and after the treatment. The results of the study show an increase in the average score from 53.11 (poor category) in the pretest to 83.57 (good category) in the posttest, with an increase difference of 30.46 points. Thus, PjBL model not only improves learning outcomes quantitatively, but also has a positive impact on students' engagement in the learning process. As such, students become more active in discussions, more critical in organizing arguments, and more skilled in developing logical and convincing written ideas.

**Keywords:** Project Based Learning, Argumentative Text, Writing Skills.

## 1. Introduction

Writing argumentative texts is considered a crucial skill in the learning process of the Indonesian language, especially at the Vocational High School (SMK) level. This skill requires not only mastery of text structure and language rules, but also the ability to think critically and compose logical, relevant, and persuasive arguments. Unfortunately, various studies have shown that students still face difficulties in writing argumentative texts. Research conducted at SMK Negeri 1 Nawangan, for example, revealed that many students' essays lack an introduction or conclusion, and the content written does not align with the title or support the argumentative function of the text (Asmarani & Markhamah, 2018). Similar findings have also been reported by other studies that affirm the low ability of high school students in Indonesia to construct arguments supported by data or valid reasoning (Nakrowi et al., 2024).

This situation is closely related to the dominance of conventional learning models that are still teacher-centered and lack space for student exploration. Such a learning pattern limits



writing activities to mere routines without involving critical thinking, collaboration, or contextual learning experiences. As a result, students tend to be passive and struggle to develop good argumentative writing skills. For this reason, an alternative learning model is needed that can place students as active subjects, provide opportunities for experimentation, collaboration, and produce tangible products from their learning processes.

One potential model that can address this need is Project Based Learning (PjBL). This model encourages students to engage directly in real projects, work collaboratively in groups, design products, and present their learning outcomes. This process not only enhances motivation, but also nurtures responsibility, creativity, and critical thinking skills in students. Several previous studies have shown the effectiveness of PjBL in improving non-argumentative text writing skills, such as expository and biographical texts, as well as fostering student interest in learning (Lumbanraja et al., 2025; Sholih & Aeni, 2019).

However, there are several research gaps and underlying factors that drive this study. First, research directly linking the use of PjBL with the development of argumentative writing skills in vocational high schools is still very limited, especially in local contexts such as SMK Koperasi Pontianak. Second, empirical data on the specific difficulties experienced by vocational high school students in Pontianak in writing argumentative texts is still scarce, making this research essential to provide field evidence. Third, factors that support or hinder the implementation of PjBL in vocational high schools, such as teacher readiness, facilities, student motivation, and feedback mechanisms, have not been deeply studied. Fourth, there is still limited research directly comparing the effectiveness of PjBL with conventional teaching methods in the context of argumentative writing, thus the advantages and limitations of PjBL are not fully mapped out.

Based on the aforementioned background, this research was conducted to examine the impact of implementing the Project Based Learning model on the ability of eleventh grade students at SMK Koperasi Pontianak to write argumentative texts. The research findings are expected to make a significant contribution to the development of Indonesian language learning strategies at the vocational school level, while also enriching the study on the effectiveness of PjBL in the context of argumentative text writing, which has been rarely explored in depth in the local environment.

## 2. Methods

The community service activity was carried out at SMK Koperasi Pontianak with 28 students from the eleventh grade majoring in Indonesian Language as the primary partners, accompanied by an Indonesian Language subject teacher. The implementation method followed the principle of participatory mentoring, emphasizing the active involvement of both teachers and students in every stage.

### 1. Activity Location and Subject

- a) Location: SMK Koperasi Pontianak.
- b) Subjects: 28 students of grade XI who were selected by simple random sampling technique. The Indonesian teacher acted as a companion as well as a facilitator for the implementation of PjBL.

### 2. Preparation Stage

- a) Coordination with the school: The service team coordinated with the principal and teachers regarding the objectives, schedule, and form of the activities.

- b) Needs analysis: Initial identification is conducted on the challenges faced by students in writing argumentative texts, based on input from teachers and preliminary observations.
  - c) Tools Preparation: Prepare lesson plans, PjBL modules, and evaluation instruments for argumentative writing skills
3. Activity Implementation Stage
- a) Socialization and Training: Teachers and students were introduced to the concept of Project Based Learning (PjBL), its implementation principles, and its benefits for improving writing skills.
  - b) PjBL Implementation:
    - a. Students are divided into small groups to work on an argumentative text writing project based on real issues in the school/environment.
    - b. The service team assisted each group in the process of gathering information, discussing, organizing arguments, and writing draft texts.
  - c) Presentation and Reflection: Each group presented their argumentative texts. The presentation is accompanied by feedback from the teacher, peers, and the service team.
4. Evaluation Stage
- a) Quantitative evaluation:
 

Students' writing ability was measured through argumentative text writing tests before and after the activity (pretest-posttest). The assessment instruments were tested for reliability and data analysis prerequisites before use.

    - a. The reliability test showed a Cronbach's Alpha value of 0.714 from 15 assessment items. This value is categorized as reliable because it exceeds the 0.70 threshold.
    - b. Normality test with Shapiro-Wilk showed that the pretest data was normally distributed (sig. 0.165), while the posttest data was not normal (sig. 0.007). However, because the research design uses paired groups (paired samples), the analysis can still be done.
    - c. The homogeneity test resulted in a significance value of 0.041, which means that the variance of the data is not homogeneous. However, this is not an issue as the main analysis only compares two conditions within the same group.
    - d. Data analysis was conducted with Paired Sample t-test to determine the difference in students' writing ability before and after the application of PjBL.
  - b) Qualitative evaluation:
 

In addition to the test, the service team also conducted classroom observations to see student activeness and short interviews with teachers and students to explore experiences, challenges, and benefits of the activities.
5. Follow-up Stage
- a) The service team handed over the guidelines for implementing PjBL to partner teachers so that they could be used independently in routine learning.
  - b) Schools are encouraged to make PjBL as one of the sustainable learning strategies in improving students' writing skills.

### 3. Results and Discussion

#### 3.1. Research Results

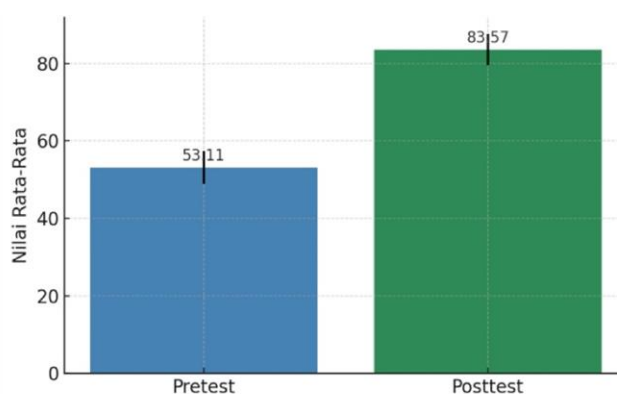
The research results show a significant improvement in students' argumentative text writing skills after implementing the Project Based Learning (PjBL) model. This improvement was proven through comparison of pretest and posttest scores and inferential statistical analysis results.

**Table 1. Statistical Comparison of Pretest and Posttest Argumentative Text Writing Skills**

| Description        | Pretest | Posttest |
|--------------------|---------|----------|
| Number of Students | 28      | 28       |
| Total Score        | 1,487   | 2,340    |
| Average Score      | 53.11   | 83.57    |
| Highest Score      | 63      | 91       |
| Lowest Score       | 46      | 76       |
| Standard Deviation | 4.202   | 4.013    |
| Skill Category     | Poor    | Good     |

Source: processed data, 2024

Based on the data presented in Table 1, there is a noticeable increase in the proficiency of students in writing argumentative texts following the implementation of Project Based Learning (PjBL). The average score of students increased by 30.46 points, from 53.11 in the pretest categorized as "poor" to 83.57 in the posttest categorized as "good". This improvement not only reflects quantitative enhancement but also signifies an enhancement in the quality of students' writing, including coherence, structuring of arguments, and the ability to communicate ideas effectively. Furthermore, the relatively consistent distribution of scores, as indicated by the decrease in standard deviation from 4.202 in the pretest to 4.013 in the posttest, suggests that the improvement in writing skills was experienced evenly by most students. Consequently, it can be inferred that the implementation of the PjBL model has a positive impact on enhancing argumentative writing skills, as it encourages students to be more active, engaged, and systematic in composing texts.



**Figure 1. Graph of Average Score Improvement from Pretest to Posttest**

Figure 1 illustrate the graph of the increase in average scores from pretest to posttest, reinforces the success of implementing Project Based Learning (PjBL) in improving students' skills in writing argumentative texts. It is evident that students' average scores increased significantly by 30.46 points, from the "poor" category in the pretest to the "good" category in

the posttest. The visualization of this graph provides a clearer picture of the changes in student learning outcomes, where the substantial difference between the two test results signifies a significant impact from the use of the PjBL model. This improvement not only demonstrates the students' success in composing more systematic texts, but also reflects their ability to communicate ideas in a more structured, coherent, and persuasive manner. Thus, this graph strengthens the finding that PjBL can encourage active student engagement in the learning process and have a positive impact on the quality of their argumentative writing.

### 3.2. Inferential Statistical Tests

To strengthen the above findings, a series of statistical tests were conducted using SPSS, including normality tests, homogeneity tests, and t-tests.

**Table 2. Shapiro-Wilk Normality Test Results**

| Data     | Statistic | df | Sig.  | Description |
|----------|-----------|----|-------|-------------|
| Pretest  | 0.949     | 28 | 0.183 | Normal      |
| Posttest | 0.971     | 28 | 0.621 | Normal      |

The results of the normality test using Shapiro-Wilk on Table 2 indicate that the pretest data has a significance value of 0.183 and the posttest data has a value of 0.621. Both values are greater than the significance level of 0.05, therefore it can be concluded that the data is normally distributed. This condition is vital as it satisfies one of the fundamental assumptions in parametric statistical analysis, particularly for the paired sample t-test utilized in this study.

**Table 3. Levene's Test Homogeneity Results**

| Variable | F     | Sig.  | Description |
|----------|-------|-------|-------------|
| Pretest  | 0.840 | 0.626 | Homogeneous |

The homogeneity test using Levene's Test in Table 3 indicates a significance value of 0.626, which is greater than the significance level of 0.05. This suggests that the pretest data has homogeneous variances. Homogeneity of variances is a crucial requirement for proceeding with the paired sample t-test analysis, as it ensures that the score differences obtained are not due to imbalances in data distribution among groups. As such, the homogeneity test results strengthen the validity of the inferential analysis conducted, while also providing strong evidence that the improvement in students' argumentative text writing skills is indeed linked to the implementation of the Project Based Learning (PjBL) model, rather than unbalanced data distribution factors.

**Table 4. Hypothesis Test Results (Paired Sample T-Test)**

| Statistic                               | Value  |
|-----------------------------------------|--------|
| Average Difference                      | 30.464 |
| Standard Deviation of Difference        | 6.658  |
| Standard Error Mean                     | 1.258  |
| t value                                 | 24.211 |
| Degrees of Freedom (df)                 | 27     |
| Sig. (2-tailed)                         | 0.000  |
| t table ( $\alpha = 0.05$ ; $df = 27$ ) | 1.703  |

The hypothesis test using paired sample t-test in Table 4 indicates that the t value of 24.211 is significantly higher than the t table value of 1.703 at a 5% significance level. Furthermore, the significance value (p-value) of 0.000 is smaller than  $\alpha = 0.05$ , leading to the

rejection of the null hypothesis ( $H_0$ ) and acceptance of the alternative hypothesis ( $H_a$ ). Therefore, it can be concluded that there is a significant impact of implementing Project Based Learning (PjBL) on students' argumentative text writing skills. The average difference of 30.464 points between the pretest and posttest results confirms that the PjBL model effectively enhances students' ability to construct arguments that are more structured, logical, and communicative. Statistically, this finding strengthens the empirical evidence that project-based learning not only provides a more meaningful learning experience but also has a tangible impact on improving students' writing skills in accordance with the demands of 21st-century education.

### 3.3. Discussion

The improvement in students' ability from an average score of 53.11 in the initial test to 83.57 in the final test indicates that the implementation of Project Based Learning (PjBL) not only impacts the skills of writing argumentative texts, but also has the capability to enhance critical thinking and written expression. In contrast to conventional approaches centered around the teacher, the PjBL model positions students as active participants in the learning process. Through completing real projects, group collaboration, data exploration, and written idea reporting, students are trained to be more responsible, independent, and courageous in presenting opinions in a coherent and substantive manner. These outcome align with the view of Rusmono (2017), who emphasize that both physical and mental engagement in learning activities are closely correlated with achieving optimal results.

The findings are strongly supported by various previous studies. Gao et al. (2024) reported that the implementation of Project Based Learning (PjBL) on students resulted in a significant improvement in the quality of argumentative writing, particularly in the aspects of idea development, text organization, and more systematic use of evidence. This indicates that PjBL not only enhances linguistic skills but also encourages students to think critically and present arguments in a more structured manner. Similar findings have been put forth by Arochman et al. (2024) in the context of English as a foreign language (EFL) learners. Their research affirms that PjBL is effective in enhancing the quality of writing by emphasizing collaborative problem-solving, the use of group discussion strategies, and the production of more coherent and cohesive texts.

Previous meta-analysis (Cahyono et al., 2024) provides consistent evidence that the effectiveness of PjBL tends to increase with the duration of the intervention. The study asserts that long-term interventions allow students to engage in a more complete writing cycle, including planning, drafting, feedback, revision, and reflection. This cycle has been shown to play a crucial role in internalizing writing strategies and strengthening argumentative abilities sustainably. Therefore, the results of this study, which show an average score increase of 30.46 points from pretest to posttest, can be explained as a consequence of implementing a project-based learning cycle that allows for active engagement, individual responsibility, and group collaboration.

In addition to contributing to the cognitive aspect, PjBL also has a positive impact on students' affective aspect. According to Marshall & Wilson (2025), the integration of PjBL with mind mapping strategies not only enhances the structure of writing, but also increases students' interest in writing. From a pedagogical mechanism perspective, the effectiveness of PjBL in improving argumentative writing skills can be understood through several key factors. Firstly, authentic project tasks encourage students to explore ideas more deeply and use evidence accurately to support arguments. Secondly, collaboration in small groups trains students to articulate opinions, listen to other perspectives, and negotiate arguments, which directly impacts the quality of writing. Thirdly, the iterative revision process supported by

teacher and peer feedback allows for refinement of texts in terms of content, organization, and language. Fourthly, the role of the teacher as a facilitator providing scaffolding is crucial for the effectiveness of implementation, as also highlighted by Duke et al. (2021), emphasizing the importance of teacher guidance in directing students' exploration through authentic and challenging projects.

The findings of this study are aligned with previous empirical research and strengthen the argument that PjBL is an effective pedagogical approach in enhancing argumentative writing skills. This model not only emphasizes the cognitive aspect of improving critical thinking skills but also the affective aspect through increased motivation, participation, and students' sense of responsibility towards the learning process. All of this evidence indicates that PjBL is relevant to be implemented in the context of 21st-century learning that demands collaboration, problem-solving, and effective communication.

## 4. Conclusion

This research shed light that the implementation of Project Based Learning (PjBL) has a significant impact on students' skills in writing argumentative texts. This is evident from the increase in students' average scores from 53.11 in the pretest to 83.57 in the posttest, with a difference of 30.46 points. The results of the paired sample t-test, which indicate a t value of 24.211 greater than the t table of 1.703 with a significance value of  $0.000 < 0.05$ , further affirm that PjBL is effective in enhancing students' ability to compose coherent, logical, and persuasive argumentative texts. The implications of these findings confirm that PjBL is relevant to be applied in writing instruction to support the mastery of 21st-century skills, such as critical thinking, communication, and collaboration. Teachers are advised to consider PjBL as an alternative learning strategy that fosters active student participation, while schools are expected to support its implementation with adequate facilities and policies. For future research, it is recommended to test other language skills as well as with a larger sample size so that the results can be more comprehensively generalized.

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