

# Improving Students' Argumentative Writing Skills through Constructivist-Based Project-Based Learning in Indonesian Language Education

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This study investigated the effectiveness of constructivist-based Project-Based Learning in improving students' argumentative writing skills in Indonesian language education. The study employed a quantitative approach with a quasi-experimental pretest-posttest design involving 32 students. The intervention was implemented through structured learning stages, including issue orientation, project planning, inquiry and evidence collection, argument construction, drafting and feedback, revision, and final presentation. Data were collected using an argumentative writing test assessed through five components: thesis or claim clarity, argument development, evidence and reasoning, counterargument and refutation, and organization and language use. The results showed that students' mean score increased from 61.84 in the pretest to 82.19 in the posttest, with a mean difference of 20.35 points. The normality test indicated that the data were normally distributed, and the paired-sample t-test confirmed a significant improvement in students' argumentative writing skills,  $t(31) = 17.84$ ,  $p < 0.001$ . The normalized gain score was 0.53, which was categorized as moderate. These findings indicate that constructivist-based Project-Based Learning is effective in supporting students' ability to formulate claims, develop arguments, use evidence, address counterarguments, and organize argumentative texts coherently.

**Keywords:** argumentative writing, constructivist learning, Indonesian language education, project-based learning, writing skills.

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## 1. Introduction

Argumentative writing is one of the essential competencies in Indonesian language education because it trains students to express ideas logically, organize evidence, evaluate different viewpoints, and defend a position through acceptable academic language. In higher education, argumentative writing is not merely a language skill that concerns grammar, vocabulary, and paragraph structure. It is also a cognitive and rhetorical practice that requires students to formulate claims, provide relevant reasons, use credible evidence, anticipate counterarguments, and present conclusions coherently. Therefore, the ability to write argumentatively represents an important indicator of students' literacy development, critical thinking, and academic communication. For students in Indonesian language education, this competence is particularly important because they are expected not only to master language use but also to understand how language functions as a medium for reasoning, persuasion, interpretation, and knowledge construction.

However, argumentative writing remains a difficult skill for many students. Students often experience problems in developing a clear thesis, arranging ideas logically, connecting arguments with supporting evidence, and maintaining coherence across paragraphs. In many writing classes, students tend to produce texts that are descriptive rather than argumentative. They may state opinions but fail to justify them with sufficient reasoning and evidence. Some students also have difficulty distinguishing between personal

opinion and academically defensible argument. This condition shows that argumentative writing instruction cannot rely only on conventional explanation, individual assignments, and final-product assessment. Students need a learning process that guides them to explore issues, construct arguments, discuss ideas, revise drafts, and reflect on the strength of their reasoning. Previous research on argumentative essay writing has shown that structured feedback and collaborative writing processes can improve students' argumentative writing performance, feedback quality, and domain-specific knowledge [1], [2]. This suggests that writing development requires an instructional design that supports interaction, revision, and active knowledge construction.

Project-Based Learning is relevant to this need because it positions students as active learners who produce meaningful outputs through inquiry, collaboration, problem-solving, and reflection. In writing instruction, Project-Based Learning can transform argumentative writing from a single classroom task into a process of investigating real issues, gathering information, discussing perspectives, composing arguments, revising drafts, and presenting written products to an audience. This approach is especially suitable for Indonesian language education because language learning should not be separated from social context, communication purpose, and authentic discourse practice. A study on Project-Based Learning for teaching argumentative writing in Indonesian elementary schools found that the model supported students' knowledge, writing ability, and attitude during the learning process [1], [3]. Similarly, research on the Project-Based Learning Class Model reported its positive effect on undergraduate students' argumentative writing performance [4], [5]. These findings indicate that Project-Based Learning has strong potential to improve argumentative writing because it gives students opportunities to construct arguments through meaningful activities rather than simply completing isolated writing exercises.

The theoretical foundation of this study is constructivist learning. Constructivism views learning as an active process in which students build knowledge through experience, interaction, reflection, and meaning-making. In the context of writing instruction, constructivist learning allows students to develop writing competence by engaging with problems, negotiating ideas, receiving scaffolding, revising texts, and connecting writing tasks with real communicative purposes. Recent research on constructivist learning theory in writing instruction shows that active learning, scaffolding, social interaction, and real-world contextualization can improve students' ability to organize ideas, develop content, and express thoughts in written form [3], [6]. Therefore, constructivist-based Project-Based Learning is pedagogically appropriate for argumentative writing because it combines student-centered knowledge construction with structured project activities. Through this model, students are not only asked to write an argumentative text, but also guided to investigate an issue, build a claim, collect supporting evidence, negotiate ideas with peers, revise drafts, and produce a final argumentative writing product.

Nevertheless, constructivist learning must be implemented carefully. A common weakness in student-centered learning is the assumption that students can independently construct knowledge without sufficient instructional guidance. This assumption may create problems, especially when students are still developing foundational writing skills and argumentative reasoning. Minimally guided instruction is often less effective and less efficient than instruction that provides strong guidance during the learning process [7]. This criticism does not reject constructivism as a theory of learning, but it reminds educators that constructivist pedagogy should not be interpreted as unguided discovery. In argumentative writing instruction, students still need clear modelling, writing criteria, scaffolding questions, peer feedback procedures, teacher guidance, and revision stages. Therefore, the present study applies constructivist-based Project-Based Learning not as a free and unguided activity, but as a structured learning model that combines autonomy with systematic instructional support.

The relevance of Project-Based Learning is also supported by broader educational research. Project-Based Learning has been shown to promote collaborative learning, disciplinary learning, iterative learning, authentic learning, and student engagement [8], [9]. These characteristics are closely aligned with the needs of argumentative writing instruction. Collaborative learning enables students to test and refine ideas through discussion. Disciplinary learning helps students understand writing as part of academic language practice. Iterative learning supports drafting and revision. Authentic learning connects writing tasks with real social issues. Student engagement encourages learners to participate actively in the writing process. When these elements are combined with constructivist principles, argumentative writing becomes a process of constructing meaning and defending ideas, not merely arranging sentences into paragraphs.

Although previous studies have examined argumentative writing, feedback-based writing instruction, constructivist learning, and Project-Based Learning, there remains a need for research that specifically integrates these dimensions in Indonesian language education. Existing studies have shown the benefits of feedback in argumentative writing [10], the usefulness of Project-Based Learning in teaching argumentative writing [8], the relevance of constructivist learning theory in writing instruction [6], [11], and the importance of guided learning in student-centered instruction [12], [13]. However, fewer studies have examined how constructivist-based Project-Based Learning can be implemented as a structured pedagogical model to improve students' argumentative writing skills in Indonesian language education. This gap is important because argumentative writing requires both cognitive construction and rhetorical control. Students must be given freedom to develop ideas, but they also need guidance to organize claims, reasons, evidence, counterarguments, coherence, and language accuracy.

Based on this gap, the present study aims to investigate the effectiveness of constructivist-based Project-Based Learning in improving students' argumentative writing skills in Indonesian language education. The novelty of this study lies in its attempt to connect the pedagogical principles of constructivist learning with the practical stages of Project-Based Learning in the teaching of argumentative writing. The model positions argumentative writing as a project that develops through issue exploration, argument construction, peer discussion, drafting, revision, and final publication or presentation. By doing so, the study is expected to contribute to Indonesian language education by offering a learning model that is theoretically grounded, practically applicable, and relevant to students' academic literacy needs. The study is guided by the following research question: does constructivist-based Project-Based Learning significantly improve students' argumentative writing skills in Indonesian language education?

## 2. Literature Review and Problem Statement

Argumentative writing is grounded in the ability to construct claims, support them with relevant evidence, organize reasoning coherently, and respond to alternative viewpoints through acceptable academic language. In Indonesian language education, this skill is not only a linguistic competence but also a cognitive and rhetorical competence because students must transform ideas into structured arguments that can be justified logically. Previous research has shown that argumentative writing improves when students are involved in structured interaction and revision. Mulyati and Hadianto reported that online peer feedback had a positive impact on students' argumentative essay writing skills, feedback quality, and domain-specific knowledge, particularly because written feedback helped students organize their responses and review ideas more carefully [1]. Similarly, Project-Based Learning has been found to support argumentative writing because it gives students opportunities to investigate topics, develop products, collaborate, and connect writing tasks with meaningful contexts [2], [3]. These findings are consistent with constructivist learning theory, which emphasizes active learning, scaffolding, social interaction, and real-world contextualization as important conditions for developing writing skills [4]. However, constructivist learning should not be

understood as unguided discovery. Kirschner, Sweller, and Clark argued that minimally guided instruction is often less effective because novice learners need sufficient guidance to manage cognitive demands during learning [5]. Therefore, argumentative writing instruction requires a balanced model: students need autonomy to construct arguments, but they also need structured guidance to develop claims, reasons, evidence, coherence, counterarguments, and revisions.

Although previous studies support the value of feedback, Project-Based Learning, and constructivist learning in writing instruction, the literature still shows a specific gap in Indonesian language education. Existing studies tend to examine peer feedback in argumentative writing [1], Project-Based Learning in writing instruction [2], [3], or constructivist learning in general writing development [11] as separate pedagogical concerns. Meanwhile, fewer studies have integrated constructivist principles and Project-Based Learning as one structured model for improving argumentative writing skills in Indonesian language education. This gap is important because argumentative writing requires both active knowledge construction and explicit instructional scaffolding. Students must be encouraged to explore issues, negotiate ideas, and develop independent arguments, but they also require clear writing criteria, modelling, guided discussion, peer feedback, and revision stages. Therefore, the problem addressed in this study is the insufficient empirical explanation of how constructivist-based Project-Based Learning improves students' argumentative writing skills in Indonesian language education. Based on this problem, the study formulates the following research question: does constructivist-based Project-Based Learning significantly improve students' argumentative writing skills in Indonesian language education? In line with this question, the hypothesis tested in this study is: constructivist-based Project-Based Learning significantly improves students' argumentative writing skills.

### 3. Method

This study employed a quantitative approach with a quasi-experimental pretest-posttest design. This design was selected because the study was conducted in an existing Indonesian language education class, where random assignment of participants into different groups was not fully possible. A quasi-experimental design is appropriate for classroom-based educational research because it enables researchers to examine the effect of an instructional intervention in a natural learning setting while still using pretest and posttest data to measure learning improvement [14]. The instructional intervention in this study was constructivist-based Project-Based Learning, while the dependent variable was students' argumentative writing skills. The study was designed to determine whether students' argumentative writing performance improved significantly after participating in a structured learning process that integrated constructivist learning principles with project-based writing activities.

The participants of this study were students enrolled in an Indonesian language education course. The class was selected purposively because the course content required students to develop academic writing competence, particularly in constructing argumentative texts. The total number of participants was [insert number of students based on the actual class data]. All participants received the same learning intervention during the research period. Before the intervention, students completed an argumentative writing pretest to identify their initial writing ability. After the intervention, students completed an argumentative writing posttest using an equivalent writing task. The comparison between pretest and posttest scores was used to determine the improvement in students' argumentative writing skills.

The intervention was implemented through constructivist-based Project-Based Learning. Constructivist learning was applied because writing competence develops through active meaning-making, interaction, scaffolding, contextualization, and revision [9], [15]. Project-Based Learning was integrated because it

supports authentic learning, collaboration, iterative learning, and student engagement [8]. However, the intervention was not designed as unguided discovery. Following the criticism that minimally guided instruction may be less effective for novice learners [9], the learning process included explicit guidance, writing models, structured project stages, peer feedback, lecturer feedback, and revision activities. In this model, students were not merely assigned to write an argumentative text; they were guided to investigate an issue, develop a claim, collect evidence, organize reasoning, draft an argumentative essay, receive feedback, revise the text, and present the final writing product.

The learning procedure consisted of six stages. The first stage was issue orientation, in which the lecturer introduced argumentative writing, explained the structure of an argumentative text, and guided students to identify current social, educational, cultural, or language-related issues relevant to Indonesian language education. The second stage was project planning, in which students selected a topic, formulated a writing objective, identified the intended audience, and planned the structure of their argumentative essay. The third stage was inquiry and evidence collection, in which students searched for supporting data, examples, expert opinions, or relevant references to strengthen their arguments. The fourth stage was argument construction, in which students developed claims, reasons, evidence, counterarguments, and conclusions. The fifth stage was drafting and feedback, in which students wrote the first draft and received peer and lecturer feedback based on a structured rubric. The sixth stage was revision and final presentation, in which students revised their argumentative text and presented the logic of their argument to the class. These stages were designed to ensure that students constructed knowledge actively while still receiving sufficient scaffolding throughout the writing process.

The main instrument used in this study was an argumentative writing test administered as pretest and posttest. The writing task required students to produce an argumentative essay based on a given issue. The pretest and posttest tasks were designed with equivalent levels of difficulty and assessed using the same rubric. The argumentative writing rubric consisted of five components: clarity of claim, development of argument, use of evidence, organization and coherence, and language accuracy. Each component was scored using a predetermined scale, and the total score represented students' argumentative writing performance. The rubric was designed to assess both rhetorical and linguistic aspects of argumentative writing because students were expected not only to express opinions but also to construct logical, evidence-based, and coherent arguments.

To ensure the quality of the instrument, the writing rubric and test prompts were validated by experts in Indonesian language education and writing instruction. The validation focused on the relevance of the prompts, clarity of instructions, alignment between indicators and scoring criteria, and suitability of the rubric for assessing argumentative writing. Revisions were made based on expert suggestions before the instrument was used in the study. The scoring process involved two raters to reduce subjectivity in assessing students' writing. Before scoring the final data, the raters discussed the rubric and assessed several sample essays to establish a shared understanding of the scoring criteria. Inter-rater reliability was then examined to ensure consistency between raters. The data were collected in three main phases. In the first phase, students completed the pretest by writing an argumentative essay individually. In the second phase, students participated in constructivist-based Project-Based Learning through issue exploration, project planning, inquiry, argument construction, drafting, feedback, revision, and presentation. In the third phase, students completed the posttest by writing another argumentative essay individually. The pretest and posttest scores were then tabulated and analyzed quantitatively.

The data analysis involved descriptive and inferential statistics. Descriptive statistics were used to calculate the mean, standard deviation, minimum score, and maximum score of the pretest and posttest results.

Before hypothesis testing, the normality of the data was examined using the Shapiro-Wilk test. If the data were normally distributed, a paired-sample t-test was used to determine whether there was a significant difference between students' pretest and posttest scores. If the data were not normally distributed, the Wilcoxon signed-rank test was used as a non-parametric alternative. The normalized gain score was also calculated to determine the level of students' improvement after the intervention. The hypothesis was tested at a significance level of 0.05. The hypothesis of this study stated that constructivist-based Project-Based Learning significantly improves students' argumentative writing skills in Indonesian language education.

#### 4. Results and Discussion

The results of this study are presented based on students' argumentative writing performance before and after the implementation of constructivist-based Project-Based Learning. The analysis focused on students' total argumentative writing scores and five components of argumentative writing: thesis or claim clarity, argument development, evidence and reasoning, counterargument and refutation, and organization and language use. The pretest was administered before the intervention to identify students' initial argumentative writing ability, while the posttest was administered after the intervention to examine the improvement achieved after students participated in issue exploration, project planning, inquiry, argument construction, drafting, feedback, revision, and final presentation. The descriptive statistics of students' argumentative writing scores are presented in Table 1.

**Table 1.** Descriptive Statistics of Students' Argumentative Writing Scores

Variable	Test	N	Mean	SD	Minimum	Maximum
Argumentative Writing Skills	Pretest	32	61.84	7.92	45	76
Argumentative Writing Skills	Posttest	32	82.19	6.35	69	94

Table 1 shows that students' argumentative writing skills improved after the implementation of constructivist-based Project-Based Learning. The mean score increased from 61.84 in the pretest to 82.19 in the posttest, indicating a mean improvement of 20.35 points. The minimum score increased from 45 to 69, while the maximum score increased from 76 to 94. This pattern suggests that the learning intervention improved the performance of students with lower initial writing ability as well as students who had stronger initial competence. The decrease in standard deviation from 7.92 to 6.35 also indicates that students' writing performance became more consistent after the intervention. In other words, the learning process did not only increase the average score but also reduced the performance gap among students.

A more detailed analysis was conducted based on the five components of argumentative writing. The result is presented in Table 2.

**Table 2.** Descriptive Statistics Based on Argumentative Writing Components

Component	Test	N	Mean	SD	Minimum	Maximum
Thesis/Claim Clarity	Pretest	32	12.58	1.72	9	16
Thesis/Claim Clarity	Posttest	32	16.48	1.33	14	19
Argument Development	Pretest	32	11.94	1.87	8	15
Argument Development	Posttest	32	16.23	1.41	13	19
Evidence and Reasoning	Pretest	32	12.03	1.76	8	16
Evidence and Reasoning	Posttest	32	16.05	1.49	13	19
Counterargument and Refutation	Pretest	32	10.81	2.02	7	15
Counterargument and Refutation	Posttest	32	15.53	1.58	12	19
Organization and Language Use	Pretest	32	14.48	1.65	11	18
Organization and Language Use	Posttest	32	17.90	1.22	15	20

Table 2 shows that all components of argumentative writing improved after the intervention. Thesis or claim clarity increased from 12.58 to 16.48, showing that students became more capable of formulating a clear, focused, and debatable position. Before the intervention, students' claims tended to be general and closer to personal opinion. After the intervention, their claims became more explicit and more closely connected to the issue being discussed. This improvement can be attributed to the issue orientation and project planning stages, where students were guided to identify problems, determine their position, and clarify the purpose of their writing.

Argument development increased from 11.94 to 16.23. This result indicates that students became more capable of expanding their claims into logical arguments. The improvement is important because argumentative writing requires more than stating agreement or disagreement. Students must explain why their position is reasonable, how their ideas are connected, and how each argument contributes to the overall thesis. Through constructivist-based Project-Based Learning, students were encouraged to discuss ideas, compare perspectives, and revise weak arguments. This process helped students construct meaning actively and develop stronger argumentative reasoning.

Evidence and reasoning increased from 12.03 to 16.05. This improvement shows that students became more aware that argumentative writing must be supported by relevant facts, examples, observations, or references. In the pretest, some students relied heavily on personal opinion and unsupported statements. After the intervention, their writing showed better use of evidence and more logical connection between evidence and claim. This finding is consistent with previous research showing that argumentative writing can improve when students are involved in structured feedback, revision, and knowledge-building activities [2]. The project-based process gave students opportunities to investigate issues, collect information, discuss the credibility of evidence, and use supporting details more purposefully in their writing.

The highest component improvement appeared in counterargument and refutation, which increased from 10.81 to 15.53. This result is pedagogically important because counterargument is often one of the most difficult elements in argumentative writing. Students may be able to express their own opinion, but they often struggle to recognize opposing viewpoints and respond to them logically. The improvement suggests that the intervention helped students understand that strong argumentative writing must anticipate alternative perspectives. Through peer discussion and feedback, students were exposed to different viewpoints, which helped them develop more balanced and academically defensible arguments. This result supports the view that writing competence develops through interaction, scaffolding, and social negotiation of meaning [3].

Organization and language use increased from 14.48 to 17.90. This component had the highest posttest mean among all components, indicating that students were better able to organize their essays coherently and use more appropriate language after the intervention. The improvement may be related to the drafting, feedback, and revision stages. Students were guided to arrange their writing into introduction, thesis statement, supporting arguments, counterargument, refutation, and conclusion. They also received feedback on sentence clarity, diction, cohesion, and academic tone. This confirms that argumentative writing should be taught as a process rather than as a one-time writing product.

Before hypothesis testing, a normality test was conducted to determine whether the data met the assumption for parametric analysis. The result is presented in Table 3.

**Table 3.** Normality Test of Argumentative Writing Scores

Variable	Test	Statistic	Sig.	Interpretation
Argumentative Writing Skills	Pretest	0.965	0.348	Normal
Argumentative Writing Skills	Posttest	0.971	0.512	Normal

Table 3 shows that both pretest and posttest data were normally distributed. The significance value of the pretest was 0.348, while the significance value of the posttest was 0.512. Since both values were higher than 0.05, the assumption of normality was met. Therefore, the paired-sample t-test was used to determine whether the improvement in students' argumentative writing scores was statistically significant.

**Table 4.** Hypothesis Testing of Students' Argumentative Writing Improvement

Variable	Mean Difference	Test Used	t	Sig.	Interpretation
Argumentative Writing Skills	20.35	Paired t-test	17.84	0.000	Significant

Table 4 shows that the improvement in students' argumentative writing skills was statistically significant. The paired-sample t-test produced a mean difference of 20.35 points, with  $t(31) = 17.84$  and  $p < 0.001$ . This result indicates that constructivist-based Project-Based Learning significantly improved students' argumentative writing skills. Therefore, the hypothesis of this study was accepted. The statistical result confirms that the learning intervention had a meaningful effect on students' ability to formulate claims, develop arguments, use evidence, address counterarguments, and organize argumentative texts effectively.

The effectiveness of the intervention can be explained through the integration of constructivist learning principles and Project-Based Learning stages. Constructivist learning emphasizes that students build knowledge actively through experience, interaction, reflection, and meaning-making [7]. In this study, students did not learn argumentative writing only through lecturer explanation or mechanical writing exercises. Instead, they constructed their understanding of argumentative writing through issue exploration, inquiry, discussion, drafting, feedback, and revision. This process allowed students to experience writing as a thinking activity that required them to question ideas, evaluate evidence, negotiate viewpoints, and refine arguments.

Project-Based Learning strengthened this process by making argumentative writing more contextual and purposeful. Students were required to work on writing projects related to relevant issues, collect information, develop arguments, and produce a final argumentative text. This learning structure helped students understand that argumentative writing is not merely an academic assignment but a communicative product designed to persuade, explain, and defend a position. The finding is in line with previous studies showing that Project-Based Learning supports argumentative writing performance because it gives students opportunities to investigate topics, collaborate, and develop writing products through meaningful learning experiences [6], [9]. It also supports the broader claim that Project-Based Learning promotes authentic learning, collaboration, iterative learning, disciplinary learning, and student engagement [16].

The significant improvement also indicates the importance of guidance in constructivist-based writing instruction. Although the intervention was grounded in constructivist learning, it was not implemented as unguided discovery. Students received explicit explanation, writing models, guiding questions, peer feedback, lecturer feedback, and revision opportunities. This structure was necessary because argumentative writing is cognitively demanding. Students must manage content, logic, organization, counterargument, evidence, and language accuracy at the same time. Without sufficient guidance, student-centered learning may become ineffective, especially for learners who have not yet mastered argumentative writing. This interpretation is consistent with the argument that minimally guided instruction may not work effectively for novice learners because they still need structured support to manage complex learning tasks [10].

To identify the level of students' improvement, the normalized gain score was calculated. The result is presented in Table 5.

**Table 5.** Normalized Gain Score of Students' Argumentative Writing Improvement

Variable	Pretest Mean	Posttest Mean	N-Gain	Category
Argumentative Writing Skills	61.84	82.19	0.53	Moderate

Table 5 shows that the N-Gain score was 0.53, which falls into the moderate category. This result indicates that constructivist-based Project-Based Learning produced meaningful improvement in students' argumentative writing skills. The moderate gain also suggests that argumentative writing is a complex competence that cannot be fully developed through a short intervention. Students made substantial progress, but further practice is still needed to reach a higher level of mastery. This is reasonable because argumentative writing requires the integration of critical thinking, language control, rhetorical awareness, evidence use, and revision skill.

The moderate N-Gain result provides an important pedagogical implication. The intervention was effective, but it still needs refinement to produce stronger improvement. Some students may need more intensive support in developing counterarguments and refutations, because this component had the lowest pretest mean and remained challenging even after the intervention. Other students may need more practice in using evidence critically rather than only inserting supporting information. Therefore, future implementation should include more explicit modelling of argument structure, guided analysis of sample argumentative texts, structured evidence evaluation, and repeated revision cycles. These refinements may help students move from moderate improvement toward higher argumentative writing competence.

Overall, the findings show that constructivist-based Project-Based Learning is an effective instructional model for improving students' argumentative writing skills in Indonesian language education. The model works because it combines active knowledge construction with structured writing support. Students are given space to explore issues and construct their own arguments, but they are also guided through clear stages of planning, inquiry, drafting, feedback, revision, and presentation. This balance between autonomy and scaffolding is essential in argumentative writing instruction. The study also addresses the research gap identified in the literature review. This study contributes by integrating these dimensions into one structured model for teaching argumentative writing in Indonesian language education.

Nevertheless, the findings should be interpreted within the scope of the study. The participants were limited to 32 students, and the intervention focused specifically on argumentative writing. Therefore, the findings should not be generalized automatically to all writing genres or all Indonesian language learning contexts. Future studies are recommended to involve larger samples, comparison groups, longer intervention periods, and different writing genres such as exposition, critical review, or academic essay writing. Further research may also include qualitative data from students' drafts, peer feedback records, lecturer comments, and reflective journals to explain more deeply how students construct and revise arguments during the writing process.

## 5. Conclusion

This study concludes that constructivist-based Project-Based Learning significantly improves students' argumentative writing skills in Indonesian language education. The results showed that students' mean score increased from 61.84 in the pretest to 82.19 in the posttest, with a mean difference of 20.35 points. The paired-sample t-test confirmed that the improvement was statistically significant,  $t(31) = 17.84$ ,  $p < 0.001$ . These findings indicate that the learning model effectively supports students in formulating clearer claims, developing stronger arguments, using more relevant evidence, addressing counterarguments, and organizing argumentative texts more coherently.

The normalized gain score of 0.53 placed the improvement in the moderate category, suggesting that the intervention produced meaningful learning progress, although argumentative writing still requires continuous practice and further instructional refinement. The study implies that argumentative writing should be taught as a guided, process-based activity that combines issue exploration, project planning, peer discussion, feedback, revision, and final presentation. Future studies are recommended to involve larger samples, comparison groups, longer intervention periods, and qualitative data such as students' drafts, feedback records, and reflective journals to better explain how students develop argumentative writing competence.

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