

Project – Based Learning as a Strategy to Improve Structure and Language Features in Explanatory Text

Author:

Lailatul Qadriyah
Umarella¹
S Binnendyk²
Rosina F. J. Lekawael³

Affiliation:

Pattimura University,
Ambon, Indonesia^{1,2,3}

Corresponding email
ryeacallysta@gmail.com

Histori Naskah:

Submit: 2026-03-02
Accepted: 2026-03-14
Published: 2026-04-03



This is an Creative Commons License This work is licensed under a Creative Commons Attribution-NonCommercial 4.0 International License

Abstract:

Mastery of explanatory text writing requires students to organize ideas logically and to apply appropriate language features that reflect causal and sequential relationships. Nevertheless, many EFL students encounter difficulties in structuring explanatory texts and maintaining linguistic accuracy. Although Project-Based Learning (PjBL) has been widely reported to improve general writing performance, limited studies have specifically examined its impact on the generic structure and language features of explanatory texts at the senior high school level. This study aims to investigate the effectiveness of PjBL in improving students' mastery of explanatory text structure and language features. A pre-experimental one-group pretest–posttest design was employed involving 35 eleventh-grade students of SMA Negeri 5 Maluku Tengah. Data were collected through writing tests assessed using an analytic rubric focusing on general statements, explanation sequences, concluding statements, and relevant language features. The data were analyzed using descriptive statistics and a paired-sample t-test at a significance level of 0.05. The findings revealed a significant improvement in students' writing performance, indicated by an increase in the mean score from 64.31 to 73.63 and a rise in mastery achievement from 17% to 80%. The statistical result ($p < 0.05$) confirms that PjBL significantly enhances students' ability to organize explanatory text structure and apply appropriate linguistic features. These findings suggest that PjBL is an effective instructional strategy for strengthening genre-based writing competence in EFL senior high school contexts.

Keywords: EFL Context; Explanatory Text; Genre-Based Writing; Language Features; Project-Based Learning

Introduction

Explanatory text is a type of factual writing that aims to explain how or why a particular phenomenon occurs through logical, systematic, and cause-and-effect relationships. (Hitimala et al. 2024) state that an explanatory text contains explanations about phenomena or events, including natural and social phenomena that occur in everyday life. This type of text describes the processes involved and provides reasons for the occurrence of an event using clear and simple language. Generally, explanatory texts are structured through three main components: a general statement, a sequence of explanations, and an interpretation or conclusion. In the context of genre-based writing pedagogy, explanatory texts are categorized as academic genres that emphasize causal reasoning, systematic organization, and objective language use. (Hyland, 2021) explains that explanation texts require writers to present information in a clear and logical sequence supported by appropriate linguistic features that reflect scientific and factual discourse. Therefore, at the

senior high school level, students are expected not only to understand the phenomena being discussed but also to apply the correct generic structure and language features in their written explanations.

The generic structure of an explanatory text typically consists of three main stages: a general statement introducing the phenomenon, a sequence of explanations describing the process or causal relationships, and a concluding statement that reinforces understanding. According to (Hyland, 2021), explanation texts follow a systematic rhetorical pattern comprising: (1) a general statement introducing the phenomenon, (2) a sequence of explanations that present step-by-step processes or causal relationships, and (3) a concluding statement that consolidates the explanation. Linguistically, such texts commonly employ the simple present tense, passive constructions, technical or scientific vocabulary, causal and temporal conjunctions, and objective, impersonal language. However, previous studies often emphasize these structural and linguistic features primarily at a descriptive level without critically examining how students actually negotiate these conventions in authentic writing practices. Consequently, mastery of these elements cannot be viewed merely as a matter of form, but as a complex process requiring students to integrate linguistic knowledge with logical reasoning and disciplinary understanding.

Explanatory writing plays a significant role in senior high school education because it supports students' academic literacy across disciplines such as science, geography, and social studies. Although studies such as (Alfi and Syamsi, 2024) highlight that learning explanatory texts helps students understand real-world phenomena and express causal relationships systematically, their arguments tend to focus more on pedagogical benefits than on examining the challenges students face when constructing coherent explanations. Similarly, research by (Hitimala et al., 2024) emphasizes the importance of explanatory writing for communicating complex ideas clearly, yet limited attention has been given to how EFL learners struggle with organizing causal reasoning, selecting appropriate linguistic resources, and maintaining textual coherence. Therefore, a more critical perspective is needed to explore not only the pedagogical value of explanatory writing but also the specific difficulties encountered by students in producing academically acceptable explanatory texts. In the context of English as a Foreign Language (EFL), this issue becomes particularly important because explanatory writing requires the simultaneous development of grammatical accuracy, disciplinary vocabulary, and logical organization, all of which are essential components of academic writing proficiency.

Despite its importance, many studies indicate that EFL students still face considerable challenges in writing explanatory texts. Explanation texts are generally structured in the form of an introduction, a sequence of explanations, and a conclusion, and they contain specific linguistic characteristics that often make them difficult for EFL learners (Hitimala et al., 2024). Students frequently demonstrate limited understanding of the generic structure, which results in unclear general statements and poorly organized explanation sequences. (Shanaha et al., 2012) highlight that explanatory texts can be particularly challenging for learners due to their complex sentence structures and the use of technical vocabulary. In addition, students often experience difficulties in applying important language features such as tense consistency, causal conjunctions, and passive voice, which ultimately affects the clarity and coherence of their writing. Several factors influence students' low ability in writing explanatory texts, one of which is the teaching approach or learning model used when delivering the material (Bidzikrillah et al., (2023). These ongoing challenges indicate the need for instructional strategies that explicitly guide students in developing both structural organization and appropriate linguistic features in explanatory writing.

One instructional model that has the potential to address these challenges is Project-Based Learning (PjBL). Project-Based Learning is widely recognized as a student-centered instructional approach that promotes

active learning through meaningful and authentic tasks. (Subiantoro, 2025) states that Project-Based Learning (PjBL) is a learner-centered instructional model that emphasizes the systematic planning and implementation of project activities. Through PjBL, students engage in learning processes that involve planning, researching, collaborating, and producing a tangible product, allowing them to construct knowledge through real-world experiences. Recent studies also confirm that PjBL can improve students' writing performance by enhancing idea generation, organization, collaboration, and language accuracy (Andargie, Amogne, & Tefera, 2025). Through project-based activities, students are encouraged to use language meaningfully and purposefully rather than merely completing mechanical writing exercises.

Empirical evidence from recent EFL studies further demonstrates that Project-Based Learning positively influences students' writing skills in terms of organization, coherence, and language use. Research conducted in Indonesian EFL contexts indicates that PjBL significantly improves students' ability to organize ideas, apply appropriate language features, and produce more coherent written texts (Martha et al., 2024). In addition, PjBL supports the development of higher-order thinking skills, creativity, collaboration, and learner autonomy, which are essential competencies for effective writing instruction in the 21st century.

However, although many previous studies have examined the effectiveness of Project-Based Learning in improving students' general writing abilities, motivation, and engagement, limited research has specifically explored its impact on students' mastery of the generic structure and language features of explanatory texts, particularly at the senior high school level. Most existing studies focus primarily on overall writing achievement without providing detailed analysis of how students organize the structural components and apply the linguistic characteristics of specific genres. Therefore, this study aims to address this research gap by investigating the implementation of Project-Based Learning as an instructional strategy to improve students' ability to organize the generic structure and apply appropriate language features in explanatory text writing.

Research Question:

How does Project-Based Learning improve students' ability to organize the generic structure and apply appropriate language features in explanatory text writing?

Literatur Study

To support this research, several previous studies were reviewed as the theoretical and empirical foundation. Previous research consistently demonstrates that Project-Based Learning (PjBL) contributes positively to students' writing development in EFL contexts. For instance, research by Martha et al. (2024) in Indonesia found that PjBL significantly improved students' ability to organize ideas, develop coherent paragraphs, and apply appropriate linguistic features. Similarly, Andargie, Amogne, and Tefera (2025) reported that project-based activities enhanced learners' grammatical accuracy, idea development, and collaborative writing performance. Although these studies confirm the effectiveness of PjBL in improving overall writing achievement, they primarily evaluate writing performance in general terms and provide limited analysis of how students construct the structural components of specific genres. Consequently, while PjBL has been widely recognized as beneficial for writing development, its role in supporting students' mastery of genre-specific writing conventions remains insufficiently explored.

In contrast, studies that specifically examine explanatory text writing highlight persistent difficulties among students in mastering both the structural organization and linguistic features of this genre. Hitimala et al. (2024) found that many high school students struggle to formulate clear general statements, develop

logically connected sequences of explanations, and use appropriate language features such as passive constructions and causal conjunctions. These findings suggest that students' challenges in explanatory writing are not merely linguistic but also organizational and conceptual, indicating the need for instructional approaches that explicitly support the development of genre awareness and structured reasoning.

From a theoretical perspective, the potential integration of Project-Based Learning with genre-based writing pedagogy provides a meaningful framework for addressing these challenges. Genre-based pedagogy emphasizes the explicit teaching of textual structures and linguistic features that characterize particular genres, enabling students to understand how texts are organized to achieve specific communicative purposes. At the same time, PjBL promotes active learning through inquiry, investigation, collaboration, and the production of authentic products. When applied to writing instruction, project activities can create meaningful contexts in which students explore phenomena, analyze causal relationships, and communicate their understanding through structured written explanations. In this sense, the inquiry-driven processes inherent in PjBL can complement the explicit structural focus of genre-based pedagogy by providing opportunities for students to apply genre conventions in authentic learning situations.

Taken together, previous studies suggest that while PjBL effectively enhances students' general writing performance and explanatory text research highlights students' difficulties in mastering genre-specific structures, limited research has attempted to integrate these two perspectives. In particular, there remains a lack of empirical studies investigating how Project-Based Learning can specifically support students in organizing the generic structure of explanatory texts within a genre-based writing framework. Therefore, this study aims to address this gap by examining how the implementation of Project-Based Learning can improve students' ability to organize the generic structure of explanatory texts systematically and effectively at the senior high school level.

Metode Penelitian

Research Design

This study employed a pre-experimental research design, specifically a one-group pretest–posttest design, to examine the effectiveness of Project-Based Learning (PjBL) in improving students' ability to organize the generic structure of explanatory text writing. In this design, a single group of students was measured before and after the implementation of the treatment, allowing the researcher to identify learning gains attributable to the instructional intervention (Creswell & Creswell, 2023; Aziz et al., 2022). Pre-experimental designs are commonly used in classroom-based educational research where random assignment and control groups are not feasible, yet meaningful instructional evaluation is required (Sugiyono, 2023; Andargie et al., 2025).

The use of a one-group pretest–posttest design is appropriate for measuring changes in students' writing performance following an instructional strategy, as it enables direct comparison of students' scores before and after the treatment (Fraenkel et al., 2023; Martha et al., 2024). Similar designs have been widely applied in educational effectiveness studies, particularly in research focusing on learning models such as Project-Based Learning, blended learning, online learning, and gamification (Aziz et al., 2022; Bidzibrillah et al., 2023; Martha et al., 2024).

Participants

The participants of this study were **35 students of class XI F5 at SMA Negeri 5 Maluku Tengah**. This class was selected using **total sampling**, as all students in the class participated in the study. The participants were considered appropriate for this research because they had previously learned explanation texts but still demonstrated difficulties in organizing the generic structure and applying appropriate language features in their writing. Using an intact classroom as the research sample is consistent with pre-experimental and school-based research practices, where ecological validity and instructional feasibility are prioritized (Aziz et al., 2022; Creswell & Creswell, 2023).

Research Instruments

The main instrument used in this study was a **writing test**, administered as a **pretest and posttest**. Students were asked to write an explanatory text based on a given phenomenon, and their writing was assessed using an **analytic scoring rubric** focusing on the **generic structure of explanatory text**, including (1) general statement, (2) explanation sequence, and (3) concluding statement. Analytic rubrics are widely recommended in writing assessment because they provide detailed information about specific aspects of students' writing performance (Hyland, 2021; Fraenkel et al., 2023).

The scoring rubric was adapted from previous studies on explanatory writing and genre-based assessment, ensuring content validity and alignment with the instructional objectives (Shanahan et al., 2012; Hitimala et al., 2024). Each component of the generic structure was scored on a scale ranging from poor to excellent performance, allowing for a maximum total score of 40. Similar rubric-based scoring systems have been applied in recent EFL writing studies to ensure reliability and objectivity in writing assessment (Martha et al., 2024; Andargie et al., 2025).

Data Collection Procedure

Data collection was conducted in three stages: **pretest, treatment, and posttest**. First, students completed a pretest to measure their initial ability in organizing the generic structure of explanatory texts. Next, the treatment was implemented through **Project-Based Learning**, where students worked collaboratively on explanatory text projects, following structured steps such as topic selection, information gathering, drafting, revising, and presenting their work. PjBL was chosen because it encourages active learning, collaboration, and meaningful language use, which are essential for developing writing skills (Subiantoro, 2025; Andargie et al., 2025).

After the completion of the project, students were given a posttest with a writing task of similar difficulty to the pretest. The use of equivalent pretest and posttest tasks is recommended to accurately measure learning gains resulting from the instructional intervention (Fraenkel et al., 2023; Aziz et al., 2022).

Data Analysis

The data were analyzed using a **paired-sample t-test** to determine whether there was a statistically significant difference between students' pretest and posttest scores. The paired-sample t-test is appropriate when comparing two related sets of scores obtained from the same participants before and after a treatment (Field, 2022; Creswell & Creswell, 2023). This statistical technique has been widely used in pre-experimental educational research to measure instructional effectiveness (Aziz et al., 2022; Martha et al., 2024).

The level of significance was set at $\alpha = 0.05$. If the obtained p-value was less than 0.05, it indicated that Project-Based Learning had a significant effect on students' ability to organize the generic structure of

explanatory text writing. The use of quantitative statistical analysis strengthened the validity of the findings and allowed for objective evaluation of learning improvement (Field, 2022; Sugiyono, 2023).

Result

The results of this study indicate that the implementation of Project-Based Learning (PjBL) significantly improved students' ability to organize the generic structure of explanatory texts. In pre-experimental research, improvement is identified by comparing students' performance before and after treatment within the same group, as explained by Creswell and Creswell (2018) and Ary et al. (2014). Similar procedures have been applied in EFL writing studies investigating the effectiveness of PjBL (Martha et al., 2024; Andargie et al., 2025).

Descriptive statistics of students' pretest and posttest scores are presented in Table 1.

Table 1. Descriptive Statistics of Pretest and Posttest Scores (n = 35)

Test	N	Minimum	Maximum	Mean	Std. Deviation
Pretest	35	50	81	64.31	7.73
Posttest	35	68	86	73.63	4.57

As shown in Table 1, the mean score increased from 64.31 in the pretest to 73.63 in the posttest, indicating a mean difference of 9.32 points. The decrease in standard deviation from 7.73 to 4.57 suggests improved consistency in students' writing performance after the PjBL intervention. According to Field (2018), a meaningful increase in mean scores accompanied by reduced score dispersion indicates stronger instructional impact. Pallant (2020) further explains that such changes in descriptive statistics support the presence of learning improvement prior to inferential testing.

The improvement is further reflected in students' mastery achievement, as shown in Table 2.

Table 2. Mastery Achievement (KKTP \geq 71)

Test	Students' Achieving Mastery	Percentage
Pretest	6	17%
Posttest	28	80%

Table 2 shows that only 17% of students achieved the minimum mastery criterion in the pretest, whereas 80% reached it in the posttest. This substantial increase suggests that the PjBL activities facilitated students' understanding of explanatory text structure and language features. Martha et al. (2024) report that PjBL enhances students' ability to organize texts coherently through collaborative and contextualized writing tasks. Similarly, Andargie et al. (2025) found that project-based instruction improves students' structural organization and writing clarity in EFL contexts.

To determine whether the improvement was statistically significant, a paired-sample t-test was conducted. The result is presented in Table 3.

Table 3. Paired-Sample t-Test Result

Variable Comparison	Mean Difference	t-value	Sig. (2-tailed)
Pretest – Posttest	-9.32	-8.47	0.000

Table 3 indicates a significance value of 0.000 ($p < 0.05$), confirming a statistically significant difference between students' pretest and posttest scores. According to Field (2018), a p-value below 0.05 indicates that the observed difference is unlikely to occur by chance. Creswell and Creswell (2018) state that a significant paired-sample t-test result in a one-group pretest–posttest design demonstrates the effectiveness of the instructional treatment. Similar statistical procedures were applied in previous PjBL studies, which also reported significant improvement in students' writing performance (Martha et al., 2024; Bidzikrillah et al., 2023).

Overall, the statistical findings provide empirical evidence that Project-Based Learning significantly improved students' ability to organize the generic structure of explanatory text writing.

Discussion

The findings of this study indicate that the implementation of Project-Based Learning (PjBL) contributed to a significant improvement in students' ability to organize the generic structure of explanatory texts. The increase of 9.32 points in the mean score suggests that students developed a stronger understanding of how explanatory texts should be structured, particularly in organizing the general statement, explanation sequence, and concluding section. Rather than merely reflecting a numerical improvement, this result indicates a qualitative shift in students' ability to construct explanations through clearer logical sequencing and more systematic organization of ideas.

The effectiveness of PjBL in improving students' structural organization can be understood through several pedagogical mechanisms embedded in the learning process. First, project activities encourage inquiry-based learning, where students investigate real-world phenomena and explore causal relationships before presenting them in written form. This investigative stage mirrors the epistemic process required in explanatory writing, where understanding a phenomenon precedes the construction of its explanation. By engaging in inquiry, students develop a deeper conceptual understanding of the phenomena they describe, which subsequently supports the logical sequencing of explanations in their texts.

Second, PjBL facilitates scaffolded knowledge construction through collaboration and discussion. During the project process, students worked in groups to explore topics, identify causes and processes, and negotiate how information should be organized in their written explanations. Through peer interaction, students were able to clarify misunderstandings, compare different ways of structuring ideas, and gradually internalize the expected structure of explanatory texts. This collaborative process supports the development of genre awareness because students actively discuss how information should be organized to make their explanations clearer and more logical.

Third, the iterative writing process embedded in project activities also contributes to improved text structure. Unlike traditional writing tasks that often involve a single drafting stage, PjBL encourages students to plan, draft, review, and revise their written products. These recursive stages allow students to reorganize their explanations, refine the sequence of ideas, and improve the coherence of their texts over time. As argued by (Brown and Abeywickrama, 2019), writing development becomes more effective when learners engage in recursive writing processes that include feedback and revision.

From a genre-based writing perspective, these pedagogical mechanisms support students' understanding of the rhetorical structure and communicative purpose of explanatory texts. According to (Hyland, 2021), effective genre instruction requires students to recognize how texts are organized to achieve particular communicative goals. In explanatory texts, writers must guide readers through a logical progression of causes, processes, and outcomes. The inquiry, collaboration, and iterative writing processes inherent in

PjBL provide authentic contexts in which students practice constructing these structural relationships while explaining real phenomena.

The findings of this study also support previous research highlighting the positive influence of Project-Based Learning on students' writing development. (Martha et al., 2024) reported that PjBL improves students' ability to organize ideas and produce more coherent texts in EFL contexts. Similarly, (Andargie et al., 2025) found that project-based instruction enhances idea generation and textual organization through collaborative inquiry and authentic writing tasks. The findings of the present study extend these previous studies by demonstrating that PjBL not only improves general writing performance but also contributes specifically to students' mastery of the generic structure of explanatory texts.

Another important finding is the substantial increase in the proportion of students achieving mastery, which rose from 17% in the pretest to 80% in the posttest. This improvement suggests that the benefits of PjBL were experienced by students with varying levels of writing proficiency. One explanation may lie in the differentiated learning opportunities created through collaboration and project tasks, which allow students to learn from both teacher guidance and peer interaction. As noted by (Thomas, 2000) and (Boss, 2015), project-based learning promotes deeper conceptual understanding through sustained inquiry and authentic problem-solving activities.

Furthermore, the reduction in the standard deviation in the posttest scores suggests that students' writing performance became more consistent after the implementation of PjBL. This indicates that the instructional approach benefited not only high-achieving students but also those who initially had lower writing abilities. The combination of inquiry activities, collaborative learning, and iterative writing stages may have created a supportive learning environment that helped students gradually internalize the structural conventions of explanatory texts.

However, it is important to acknowledge that the observed improvement cannot be attributed solely to the implementation of Project-Based Learning. Increased exposure to explanatory texts, teacher scaffolding during project activities, and peer feedback during collaborative work may also have contributed to students' improvement. These interacting factors suggest that the effectiveness of PjBL depends not only on the instructional model itself but also on how the learning environment supports inquiry, guidance, and collaborative knowledge construction.

Overall, the findings provide both empirical and pedagogical evidence that Project-Based Learning can effectively support students' ability to organize the generic structure of explanatory texts in EFL classrooms. By integrating inquiry-driven investigation, collaborative knowledge construction, and iterative writing processes, PjBL creates a learning environment that helps students understand how explanatory texts are structured and how ideas should be logically organized to explain phenomena systematically.

Conclusion

This study demonstrates that the implementation of Project-Based Learning (PjBL) can support students' ability to organize the generic structure of explanatory texts in EFL classrooms. Through inquiry, collaboration, and authentic writing tasks, project-based activities provide meaningful learning experiences that help students construct explanations in a more logical and systematic manner.

From a theoretical perspective, the findings contribute to the development of genre-based writing pedagogy by showing that student-centered learning environments can facilitate students' understanding of genre

structures through active knowledge construction. As noted by Ken Hyland, effective genre learning occurs when students understand how texts are organized to achieve specific communicative purposes. In this study, project-based inquiry provided opportunities for students to apply these organizational principles in meaningful contexts.

However, this study has several limitations. The use of a one-group pretest–posttest design limits stronger causal conclusions, and the study focuses mainly on the generic structure of explanatory texts. Future research is recommended to employ more rigorous experimental designs and to explore how Project-Based Learning influences other aspects of writing development, such as linguistic features and critical reasoning.

References

- Alfi, I., & Syamsi, K. (2024). Teaching explanatory texts to enhance students' understanding of real-world phenomena. *Journal of Language and Education Research*, 8(1), 45–58.
- Andargie, M., Tadesse, T., & Desta, S. (2025). The effect of project-based learning on EFL writing performance in senior high school. *Journal of English Language Teaching and Applied Linguistics – ELTAL*, 10(1), 23–34.
- Ary, D., Jacobs, L. C., Irvine, C. K. S., & Walker, D. (2014). *Introduction to research in education* (9th ed.). Cengage Learning.
- Asri, J. P., & Lestari, P. N. (2025). Analysis of paired-sample test results in educational pre-experimental writing research. *Journal of Educational Measurement and Assessment*, 11(2), 78–89.
- Bidzikrillah, M., Rahmawati, D., & Kurniawan, A. (2023). The effectiveness of genre-based instruction in improving students' explanatory writing skills. *Journal of English Language Teaching and Education*, 10(2), 112–125.
- Boss, S. (2015). *Implementing project-based learning: Strategies for effective classroom practice*. Solution Tree Press.
- Brown, H. D., & Abeywickrama, P. (2019). *Language assessment: Principles and classroom practices* (3rd ed.). Pearson Education.
- Cahyono, B. Y., Rachmawati, D. L., & Anugerahwati, L. (2024). Implementation of project-based learning to improve students' writing achievement. *Journal of Writing Research*, 6(1), 21–35.
- Cohen, L., Manion, L., & Morrison, K. (2018). *Research methods in education* (8th ed.). Routledge.
- Creswell, J. W., & Creswell, J. D. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). SAGE Publications.
- Field, A. (2018). *Discovering statistics using IBM SPSS statistics* (5th ed.). SAGE Publications.
- Fraenkel, J. R., Wallen, N. E., & Hyun, H. H. (2012). *How to design and evaluate research in education* (8th ed.). McGraw-Hill.
- Hitimala, R., Santosa, M. H., & Pratiwi, N. P. A. (2024). Enhancing students' explanatory text writing through genre-based instruction in EFL classrooms. *International Journal of Language Education*, 8(1), 77–89.
- Hyland, K. (2021). *Second language writing* (3rd ed.). Cambridge University Press.

- Martha, R., Sari, N., & Pratama, A. (2024). Project-based learning in EFL writing classrooms: Improving organization and coherence of explanatory texts. *Journal of English Education and Teaching*, 8(2), 201–215.
- Pallant, J. (2020). *SPSS survival manual: A step by step guide to data analysis using IBM SPSS* (7th ed.). McGraw-Hill Education.
- Rahmawati, S., Nuraini, D., & Pratama, A. (2025). Enhancing writing skills through project-based learning: A quasi-experimental study. *Edukasi Ana Journal*, 8(1), 77–90.
- Saskia, D., Haryanto, A., & Kusuma, Y. (2025). The use of interactive media to improve students' achievement: A pre-experimental study. *Educational Innovation Journal*, 5(1), 101–115.
- Sugiyono. (2019). *Metode penelitian kuantitatif, kualitatif, dan R&D*. Alfabeta.
- Thomas, J. W. (2000). *A review of research on project-based learning*. Autodesk Foundation.
- Weigle, S. C. (2002). *Assessing writing*. Cambridge University Press.