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PjBL in Academic Writing Instruction in Higher Education: Challenges, Strategies, and Synthesis of Empirical Findings

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ABSTRACT

Academic writing is a fundamental competency for university students as it serves as the main medium for logical, critical, and ethical communication of scientific ideas. However, many students still struggle with technical, structural, and motivational aspects of academic writing, indicating the need for innovative learning models that promote autonomy, collaboration, and reflection. Although project-based learning (PjBL) has been widely applied in language education, research on its effectiveness and implementation challenges in Indonesian academic writing remains limited. This study aims to analyze the application of PjBL in academic writing instruction and identify factors influencing its effectiveness. Using a narrative review guided by the population–exposure–outcome (PEO) framework, this study synthesizes ten empirical and theoretical articles published between 2020 and 2025 from Scopus, ERIC, and Google Scholar. The findings show that PjBL consistently enhances students' academic writing skills through authentic, collaborative, and reflective learning that strengthens critical thinking, motivation, and digital literacy. However, challenges persist in pedagogical practices, psychological readiness, and institutional support. This study highlights the need for systematic instructional design, continuous scaffolding, and academic technology training for both lecturers and students to optimize PjBL implementation in Indonesian higher education.

Keywords: *Project-Based Learning; Academic Writing; Higher Education*

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INTRODUCTION

Academic writing skills are fundamental competencies that students must master because they serve as a medium for logical, critical, and evidence-based scientific communication. The writing process requires clarity, coherence, accurate citations, and the ability to construct arguments systematically through the stages of planning, drafting, feedback, and revision. Teaching approaches that integrate curriculum support and peer or directed feedback have been proven effective in improving the quality of student writing (Wingate, 2018; Huisman et al., 2018; Rybicki, 2024). This ability also reflects mastery of the material, critical thinking capacity, and effective scientific communication skills (Bailey, 2022), making academic writing an important prerequisite for student success and professional development.

However, various studies indicate that students still face technical, structural, and motivational challenges in academic writing. Empirical studies on Indonesian university students report recurring difficulties related to developing critical thinking, avoiding plagiarism, and managing sentence structure, which are often exacerbated by limited practice and insufficient academic writing support (Muflihun & Tohamba, 2021). These challenges may also be influenced by students' digital readiness, as digital literacy, together with higher-order thinking skills has been shown to contribute to academic essay-writing performance (Haliq et al., 2025). Psychological and behavioral factors further complicate writing processes, since writing anxiety and academic procrastination can impede thesis-writing progress, with time management frequently emerging as a weak component of self-regulation (Pravita & Kuswandono, 2022). Overall, these findings indicate that academic writing barriers are multidimensional and require instructional approaches that address technical, cognitive, and motivational aspects in an integrated manner.

Project-based Learning (PjBL) is one learning model that is relevant for overcoming challenges in developing academic writing skills. This model provides a learning framework that includes driving questions, sustained inquiry, and public products (Mergendoller, 2012), which enable students to experience an authentic writing process oriented towards problem solving. In the context of scientific writing, driving questions can serve as problem formulations that guide the flow of argumentation, while public products are realized in the form of scientific articles that require students to produce accountable academic work. PjBL also encourages active involvement and collaboration among students in the learning process. This is demonstrated by findings that this model improves cooperation, communication, and student participation in higher education (Guo et al., 2020). In addition, PjBL facilitates the development of social metacognitive regulation through a process of monitoring and joint decision-making in groups (Lobczowski et al., 2021). With these characteristics, PjBL has the potential to support the development of academic writing skills in a more contextual and collaborative manner.

Although the effectiveness of PjBL has been widely proven in language and science learning, its application in Indonesian language courses in higher education shows different learning

characteristics. This course emphasizes scientific writing practice as a core competency, but research on the implementation of PjBL in this context is still fragmented and scattered across various studies without comprehensive synthesis. Most previous reviews have focused more on PjBL in foreign language learning or other fields, while the context of Indonesian language learning in higher education has not received adequate academic attention. The absence of such a synthesis creates a research gap regarding how PjBL is implemented, the types of projects used, their level of effectiveness, and the unique supporting and inhibiting factors in this context. Filling this gap is important to provide an empirical basis for designing and implementing PjBL optimally.

Based on this background, this study was designed to answer the following questions: "How can the implementation of PjBL in higher education improve students' academic writing skills, and what factors influence its effectiveness, challenges, and implementation strategies?" This article uses a narrative review method to map empirical findings and produce a synthesis that can be used as a reference in the development of project-based learning in Indonesian language courses.

METHOD

This study uses a narrative review approach based on Snyder's (2019) guidelines. Relevant modifications were made by limiting the publication range (2020–2025), using three independent databases (Scopus, ERIC, and Google Scholar), and applying title, abstract, and full-text selection. The keywords used included "project-based learning," "PjBL," "academic writing," and "writing skills" in Indonesian and English. A double selection process was carried out by two researchers to minimize bias.

The sources in this study are scientific articles that discuss the implementation of Project-Based Learning (PjBL) in developing academic writing skills in higher education. The selection of articles uses the PEO (population–exposure–outcome) framework, with the following components: (1) population: university students; (2) exposure: implementation of PjBL; and (3) outcome: academic writing skills. The articles included must have been published between 2020 and 2025, be available in full text, be written in Indonesian or English, and be relevant to the research focus. Articles in the form of abstracts, incomplete proceedings, or those not relevant to the theme were excluded.

A total of 10 articles met the criteria and were analyzed using narrative synthesis following the principles described by Snyder (2019). The analysis focused on: (1) the form of PjBL implementation in academic writing learning, (2) the effectiveness of PjBL on academic writing skills, and (3) the challenges and strategies for its implementation. The findings were then combined to produce a theoretical synthesis and practical implications that can be used in Indonesian language learning in higher education.

RESULTS AND DISCUSSION

A total of ten articles were identified through the process of identification, screening, and inclusion of articles based on the PEO criteria as described in the methods section. The dominance of publications in the 2023–2024 range (60%) indicates that

studies on Project-Based Learning (PjBL) in academic writing is a relatively new and evolving research topic, especially with the increasing demands of 21st-century competencies and the need for digital-based learning.

Table 1. Distribution of Articles by Publication Year

No.	Year	Number of Articles	Percentage
1	2020-2022	-	
3.	2023-2024	6	60%
4.	2025	4	40%

The sources of the articles are from national and international journals, with the proportions shown in the following table.

Table 2. Article Sources

No.	Article Source	Number	Example Journal
1	National Journal	7	Journal of Education Method and Learning Strategy
2.	International Journal	3	Social Sciences & Humanities Open

The articles were obtained from searches on three main databases, namely Scopus, ERIC, and Google Scholar. In general, all articles contribute to the understanding of PjBL implementation in academic writing, but with varying focuses and methodological approaches. The synthesis of the core findings from the ten articles can be summarized into three major patterns:

1. PjBL has been shown to improve students' academic writing skills through authentic learning experiences. Number of studies, such as those conducted by Lustyantie et al. (2023), Paris et al. (2024), and Yulandari et al. (2024), show that real projects in the form of scientific article writing help students understand the structure of writing, develop arguments, and strengthen paragraph coherence.
2. The success of PjBL is greatly influenced by psychological and collaborative aspects. Studies by Taiebine et al. (2025) and Novalia et al. (2025) confirm that intensive collaboration, peer support, and increased self-efficacy play an important role in the writing process. Interactions between students provide space to exchange ideas, overcome obstacles such as writer's block, and increase motivation and confidence.
3. The integration of technology and digital literacy is a determining factor in the Indonesian context. Research by Adrizal et al. (2024) and Hudaa et al. (2025) shows that the use of digital tools such as Mendeley helps with citation and reference management, but students' limited ICT skills are often an obstacle. This condition indicates that technological support needs to be improved so that PjBL implementation can run optimally.

Unlike some international studies that emphasize the socio-emotional aspects of scientific writing, several studies in

Indonesia show that the main challenges lie in students' basic academic literacy and technical skills. This indicates that the local context has more complex dynamics related to technological readiness and scientific writing experience. This initial synthesis forms the basis for a more in-depth analysis in the following subchapters on the implementation, challenges, and problem-solving strategies identified in the ten articles.

Implementation of PjBL in Improving Academic Writing Skills.

A synthesis of the ten articles shows that Project-Based Learning (PjBL) consistently contributes to improving students' academic writing skills. These improvements are seen in the aspects of writing structure, coherence of ideas, argumentation, as well as increased motivation and learning autonomy. This general finding shows that PjBL is effective because it integrates authentic learning experiences, collaboration, and reflective processes relevant to scientific writing practices. Furthermore, in its implementation, there are PjBL mechanisms for improving students' academic writing skills, which are described as follows.

1. *Authentic learning* is the main mechanism that strengthens writing skills. Through real projects such as writing scientific articles, students understand the writing process thoroughly and learn to apply theory in a practical context. This activity helps them develop writing organization and argument consistency (Lustyantie et al., 2023).
2. *Collaboration and peer feedback* play an important role in improving writing quality. Group discussions, peer evaluations, and revision activities encourage students to identify weaknesses and improve the structure of their writing. A collaborative environment also strengthens self-efficacy and fosters metacognitive awareness in the writing process (Novalia et al., 2025; Taiebine et al., 2025).
3. PjBL supports the development *of critical thinking and analytical skills* because students are required to evaluate sources, develop arguments, and present ideas systematically. The process of problem solving through projects makes students more skilled at processing information and expressing ideas academically (Paris et al., 2024).
4. *The integration of technology,* such as the use of citation applications, adds value to the writing process. Although students' digital literacy varies, technology has been proven to assist in literature searches and reference management in writing projects (Adrizal et al., 2024; Hudaa et al., 2025).

In addition, PjBL has *motivational and psychological* impacts, including reducing writing anxiety and increasing self-confidence. Students are more diligent and engaged because the projects they work on are relevant and oriented towards real products.

On the other hand, the synthesis shows a striking difference between international research and research in Indonesia. International studies place more

emphasis on socio-emotional factors as drivers of PjBL success, including student motivation, collaboration, and confidence (Taiebine et al., 2025; Novalia et al., 2025). In contrast, research in Indonesia tends to focus on technical barriers such as digital literacy, the use of reference applications, and limitations in ICT integration (Adrizal et al., 2024; Hudaa et al., 2025). Differences are also seen in the aspect of learning independence: some studies report an increase in autonomy, but other studies show a strong dependence on lecturer guidance, indicating variations in readiness for independent learning (Lustyantie et al., 2023; Tressyalina et al., 2023). Furthermore, the effectiveness of PjBL differs according to the nature of the learning process. Face-to-face PjBL is more effective in building structural understanding, while online PjBL is effective when supported by strong instructional design such as backward course design (Tressyalina et al., 2023; Efendi, 2023).

Challenges in Implementing PjBL

Although effective, the implementation of PjBL faces challenges in several aspects. Pedagogically, students often find it difficult to understand the project flow, manage ideas, and maintain the cohesion and coherence of their writing (Lustyantie et al., 2023; Paris et al., 2024). Psychologically, anxiety, self-doubt, and time management become obstacles that reduce learning autonomy (Novalia et al., 2025). Technological challenges are also common, especially those related to digital literacy, the use of citation applications, and access to academic sources (Adrizal et al., 2024; Hudaa et al., 2025). Institutional barriers include limited facilities, lecturer teaching loads, and a lack of collaborative support. In addition, students still face obstacles in academic structure, language style, and limited scientific writing experience (Efendi, 2023; Tressyalina et al., 2023).

Table 3. Main Challenges in Implementing PjBL in Academic Writing

Aspect	Description
Pedagogical & Cognitive	Instructor consistency, lack of guidance, cohesion/coherence, task complexity, understanding of PjBL stages
Psychological & Motivation	Anxiety, self-doubt, time management, lack of autonomy
Technology & Digital Literacy	Integration of Mendeley/Word, source searching, low digital literacy, access gap
Institutional & Resources	Faculty teaching load, limited funding, lack of collaboration, inadequate infrastructure
Specific Academic Writing	Academic style, topic selection, reference format, understanding structure, authentic experience

Problem-Solving Strategies

Effective PjBL implementation requires complementary pedagogical strategies, technological support, and institutional reinforcement. On the pedagogical side, structured learning through Backward Design, clear instructions, and scaffolding from the outset has been proven to be helpful in enabling students to understand the project flow and improve their readiness for academic writing (Tressyalina et al., 2023;

Efendi, 2023). The development of independence is strengthened through training in source searching, time management, and reflective activities such as *peer review,* which help students improve self-regulation and the quality of their writing revisions (Novalia et al., 2025; Taiebine et al., 2025).

Technological support is also important, especially ICT training and the provision of access to reference applications, databases, and digital facilities. Differences in infrastructure availability are a determining factor in the success of implementation (Adrizal et al., 2024; Hudaa et al., 2025). At the institutional level, a culture of collaboration, mentorship programs, and adequate resource allocation help ensure the sustainability of PjBL. Technical guidance on article structure, template use, and publication simulations are key to strengthening students' academic writing skills (Efendi, 2023).

Table 4. Problem-Solving Strategies

Aspect	Description
Pedagogical & Design	Structured instruction, Backward Design, scaffolding
Independence	Resource search, time management, peer review, self-regulation
Technology	ICT training, access to devices & databases, integration of digital applications
Institutional	Mentorship, collaboration, resource support
Writing Skills	Structured guidance, templates, publication simulations

PjBL Implementation Framework in Academic Writing Learning

Academic Writing Learning requires an approach that can integrate concept mastery, research skill development, and the production of authentic work in accordance with scientific standards. Project-Based Learning (PjBL) has emerged as a relevant strategic framework to meet this challenge, as it places students as active participants in writing projects based on real-world problems. The following table outlines the key elements in the context of academic writing learning, complete with concrete strategies that teachers can adopt and their practical impacts. From systematic planning that leads to the production of scientific articles to holistic evaluation that assesses the writing process and results, this framework connects each stage of learning with authentic writing experiences. Through the integration of technology, team collaboration, and publication simulations, PjBL builds students' writing competencies and prepares them to face professional demands in academia and industry.

Table 5. Implementation Strategies

Key Elements	Implementation Strategies by Educators	Practical Impact
Systematic Planning	1) Essential questions as a guide, 2) Backward Course Design, 3) Development of evaluation stages	Integrating learning objectives, activities, and assessments into a coherent flow.
Transformative Role	1) Instructors as facilitators, coordinators, and consultants, 2) Scaffolding, 3) Facilitating reflection at the end of the project	Combining instructional guidance with the development of student autonomy.

Collaboration & Technology	1) Forming groups for problem-solving, 2) Integrating *e-learning* & digital tools (Mendeley, MS Word) 3) Using platforms for real-time interaction	Integrating teamwork, technology utilization, and resource access within the learning ecosystem.
Authenticity & Relevance	1) Focus on producing tangible work (scientific articles, proposals), 2) Simulate publication to journals/external audiences, 4) Collaborate with practitioners/researchers	Connecting learning with real-world contexts and professional needs.
Holistic Evaluation	1) Continuous progress monitoring, 2) Assessment of process & results (not just exams) 3) Questionnaires & guided reflection	Integrating formative, summative, and student self-development assessments.
Institutional Support	1) ICT training for faculty and students, 2) Provision of infrastructure (collaboration spaces, databases), 3) Allocation of resources (time, funding)	Coordinating technical, administrative, and resource support for the sustainability of PjBL.

By implementing this framework in an integrated manner, educators can optimize the function of PjBL to enhance academic writing skills while developing 21st-century skills such as collaboration, problem-solving, and independent learning.

Limitations and Recommendations for Further Research

This study has several limitations that need to be considered. First, the use of a narrative review approach makes the process of selecting and interpreting findings more susceptible to subjectivity than a systematic review with a more rigorous protocol. Second, the number of articles analyzed is relatively limited and most come from similar geographical contexts and disciplines, so the results cannot be generalized broadly. Third, variations in methodological quality among articles may affect the depth of the synthesis of findings.

For further research, studies combining a systematic review or meta-analysis approach are needed to produce more measurable findings. Empirical research on the effectiveness of PjBL in a digital and interdisciplinary context is also important to broaden understanding of the implementation of this model. In addition, longitudinal studies on the development of students' academic writing skills in PjBL can provide deeper insights into the long-term impact of project-based learning.

CONCLUSION

The main issue raised in this study stems from the challenges that hinder students' academic writing skills in higher education. This is influenced by technical language barriers, limited learning strategies, and a lack of motivation and digital literacy. This condition calls for an innovative learning model that can integrate cognitive, affective, and social aspects in the academic writing process. A review of ten empirical and theoretical articles shows that project-based learning *(*PjBL) consistently has a positive impact on improving students' academic writing skills. PjBL is effective because it promotes authentic, collaborative, and reflective learning that fosters independent learning, critical thinking, and the ability to adapt to academic technology. In addition, the implementation of PjBL has also been proven to strengthen student motivation and

confidence through meaningful learning experiences oriented toward real products.

The implications of these findings suggest that PjBL is worth adopting as a strategic approach to academic writing in Indonesian higher education. Optimal implementation requires systematic instructional design, scaffolding (gradual instructional support), academic technology training for lecturers and students, and ongoing institutional support. Although the results show strong effectiveness, this study has limitations because it only uses a descriptive narrative review approach without meta-quantitative analysis. Therefore, further research needs to be conducted using a systematic review or meta-analysis approach to measure the magnitude of the PjBL effect more objectively and compare its implementation variations across various disciplines. Overall, this study confirms that Project-Based Learning plays a role as a pedagogical strategy and transformational paradigm capable of fostering an independent, collaborative, and reflective academic generation. This model offers a new direction for writing instruction in higher education that is more contextual, participatory, and oriented toward the development of 21st-century competencies.

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