

To What Extent Can Problem-Based Learning Drive Students' Critical Writing Skills?

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Abstract

This study investigates the extent to which Problem-Based Learning (PBL) can enhance students' critical writing skills in an English as a Foreign Language (EFL) context. Eleven undergraduate students participated in the study and produced a critical writing assignment that served as the primary data source. Using a descriptive qualitative design, the analysis focused on examining how students formulated research problems, constructed thesis statements, and developed arguments, counter-arguments, evidence, and interpretations within their essays. Manual coding was applied to identify recurring patterns of critical thinking indicators, followed by content analysis to interpret the depth and coherence of students' written responses. The findings reveal that PBL provides a meaningful scaffold for strengthening higher-order thinking and guiding students to move beyond descriptive writing. Most students demonstrated improvement in identifying issues, articulating them as topic sentences, and developing logically connected discussions supported by reasoning and data. Although variations in writing quality were evident, the overall results indicate that PBL fosters critical engagement, enhances argumentative organisation, and supports learners' development of analytical perspectives in writing. These findings suggest that PBL is a promising pedagogical approach for cultivating students' critical writing competence and call for further research on integrating PBL-based critical thinking instruction in EFL writing classrooms.

Keywords: problem-based learning; critical thinking; critical writing; EFL writing skills

INTRODUCTION

Writing is widely recognised as one of the most cognitively demanding skills in second language learning, requiring not only linguistic accuracy but also the ability to organise ideas, construct arguments, and engage critically with content (Hyland, 2019; Weigle, 2022). In higher education, the expectation for students to demonstrate critical engagement through writing has grown significantly as universities increasingly emphasise analytical reasoning, problem solving, and the capacity to articulate evidence-based arguments (Wingate & Hakim, 2022). However, many EFL learners continue to struggle with

producing well-structured and critically informed texts, often remaining at the descriptive level rather than developing clear problem statements, arguments, and interpretations (Handayani, 2023). This gap highlights the need for instructional approaches that explicitly cultivate higher-order thinking within writing instruction. One approach that has gained increasing attention is Problem-Based Learning (PBL), which situates learning around real-world issues to stimulate inquiry, reasoning, and reflective decision-making, skills that align closely with the demands of critical writing (Hmelo-Silver, 2019; Thorndahl & Stentoft, 2020). Given that critical writing requires students to define problems, evaluate perspectives, and justify claims using logical reasoning, integrating PBL into writing instruction offers a promising pathway to enhance students' ability to construct thoughtful and analytically rigorous texts. Thus, investigating the role of PBL in driving EFL students' critical writing ability is both timely and pedagogically significant.

Building on the growing emphasis on integrating higher-order thinking into writing instruction, a substantial body of research has examined how pedagogical interventions can strengthen students' critical engagement in academic texts. Recent studies consistently report that EFL learners benefit from instructional models that foreground inquiry, problem exploration, and evidence-based reasoning, features central to critical writing development (Wingate & Hakim, 2022). Within this domain, Problem-Based Learning (PBL) has been widely explored for its capacity to promote analytical reasoning and learner autonomy. Empirical studies in higher education contexts show that PBL encourages students to identify problems, evaluate multiple perspectives, and construct argumentation with greater coherence and justification (Kardoyo et al., 2020; Liu & Pásztor, 2022). In EFL writing classrooms specifically, PBL has been shown to enhance students' ability to formulate thesis statements, synthesise information from various sources, and engage in reflective interpretation (Kumar & Refaei, 2017; Seibert, 2021). These findings align with broader evidence that PBL facilitates both cognitive engagement and deeper disciplinary thinking, thereby supporting students in shifting from descriptive narration toward more analytical and evaluative writing (Thorndahl & Stentoft, 2020).

Although previous studies consistently highlight the potential of Problem-Based Learning (PBL) to cultivate higher-order thinking and improve students' analytical engagement in writing, several gaps remain evident in the existing literature. First, much of the current research focuses on students' perceptions, classroom observations, or experimental outcomes, but only a limited number of studies analyse students' actual written products to examine how PBL influences the construction of research problems, thesis development, argumentation, and interpretation within authentic essays (Liu & Pásztor, 2022; Seibert, 2021). Second, many studies investigate PBL within broader language learning contexts, such as reading comprehension, speaking, or project-based work, rather than specifically situating PBL within the domain of critical writing, which requires more complex cognitive and rhetorical skills (Kardoyo et al., 2020). Third, existing studies often rely on large-scale quantitative designs that may overlook the nuanced shifts in students' reasoning, structure, and argumentative choices that emerge through close examination of their writing (Thorndahl & Stentoft, 2020). As a result, there is still limited empirical understanding of how PBL shapes students' critical writing processes and to what extent these processes manifest in tangible improvements in their written texts. These gaps highlight the need for research that closely analyses students' writing outcomes within a PBL

framework, thereby providing more fine-grained evidence of PBL's pedagogical impact, an issue addressed in the present study and elaborated in the next section.

In light of these theoretical and empirical gaps, the present study aims to investigate the extent to which Problem-Based Learning (PBL) can drive students' critical writing skills by closely examining their written products within an inquiry-oriented instructional context. The study focuses on how PBL supports students in identifying issues, formulating thesis statements, constructing arguments, integrating evidence, and demonstrating analytical reasoning in their essays. By directing attention to these rhetorical and cognitive indicators, the research seeks to generate a more fine-grained understanding of how PBL functions as a mechanism for fostering critical engagement in academic writing. Accordingly, the study is guided by the following question: To what extent can Problem-Based Learning drive students' critical writing skills in an EFL context? Through this focus, the study aims to provide empirical evidence that can inform the design of more effective critical writing instruction and contribute to ongoing discussions about the role of inquiry-based pedagogy in enhancing EFL students' academic writing competence.

METHOD

Research Design

This study employed a descriptive qualitative research design to explore how Problem-Based Learning (PBL) supports the development of students' critical writing skills. A qualitative approach was deemed appropriate because the aim was to examine the nature and quality of students' written products rather than to quantify learning outcomes. Descriptive qualitative design allows researchers to capture meaning, interpret patterns, and analyse how students construct arguments within authentic writing tasks (Yin, 2018). This design aligns with understanding PBL as an instructional process that shapes learners' reasoning, problem formulation, and argumentative structures. Qualitative inquiry is also commonly used to investigate writing performance when researchers want to highlight nuance, context, and cognitive processes embedded in texts (Hyland, 2016).

Context and Participants

The study was conducted in an undergraduate English Education programme at a public Indonesian university. Eleven second-year EFL students participated voluntarily as part of their academic writing course. Participants were selected using convenience sampling, a strategy widely accepted in classroom-based research when intact groups are naturally available (Patton, 2015; Dörnyei & Csizér, 2012). All participants had completed introductory writing courses but had limited experience with inquiry-based or PBL-oriented writing instruction. Their background made them suitable for examining how PBL shapes early-stage critical writing practices.

Data Sources and Instruments

The primary data consisted of students' critical essays written after completing a structured PBL cycle. These essays were chosen as the main data source because written products provide rich insights into learners' reasoning, argument quality, and ability to synthesise evidence (Hyland & Shaw, 2016). An analytical rubric, adapted from established indicators of critical writing such as issue identification, thesis clarity, reasoning, evidence use, counter-argumentation, and interpretation, served as the coding heuristic during

analysis. Analytic frameworks for critical writing have been used extensively in applied linguistics research to examine higher-order thinking in student texts ([Wingate & Hakim, 2022](#)). No surveys or interviews were used, as the study focused on observable manifestations of PBL in student writing.

Data Collection Procedures

Data were collected after the students completed a full PBL cycle that included: (1) problem exploration, (2) collaborative discussion, (3) independent inquiry, (4) synthesis of information, and (5) formulation of a written response. This sequence follows widely recognised PBL models in language and higher education ([Hmelo-Silver, 2004](#); [Savery, 2015](#)). Students were then assigned an individual critical writing task aligned with the issues discussed during the PBL cycle. Completed essays were submitted electronically and compiled for analysis. Students were informed that their essays would be used for research purposes and that participation would not affect their grades. This procedure helped maintain authenticity, reduce performance pressure, and ensure naturalistic data.

Data Analysis

Data were analysed using qualitative content analysis to identify how students' essays demonstrated critical writing features developed through the PBL process. The analysis followed a reflexive thematic approach, which is widely used in contemporary qualitative writing research because it enables systematic interpretation while acknowledging the researcher's active role in meaning-making ([Braun & Clarke, 2022](#); [Byrne, 2022](#)). The analytic procedures included iterative familiarisation with the essays, line-by-line coding guided by established indicators of critical writing, grouping codes into conceptual categories, reviewing cross-textual patterns, and refining themes that captured students' reasoning, argumentation, and problem engagement. Manual coding was intentionally employed to sustain proximity to the linguistic and rhetorical choices within the texts, an approach recommended for analysing student writing where nuance and authorial intent are central ([Miles et al., 2020](#); [Schreier, 2012](#)).

To enhance trustworthiness, the analysis incorporated peer debriefing with an experienced writing instructor who reviewed coding decisions and provided interpretive feedback, contributing to analytic credibility and consistency. Considerations of credibility, dependability, and confirmability followed contemporary qualitative quality frameworks that extend Lincoln and Guba's foundational criteria and emphasise transparency and reflexivity in interpretive research ([Nowell et al., 2017](#); [Levitt, 2021](#)).

Ethical Considerations

Ethical protocols were observed by informing students of the study's purpose, ensuring their participation was voluntary, and giving them the right to withdraw at any time. All essays were anonymised and assigned pseudonyms before analysis. The study adhered to institutional research ethics guidelines for work involving human participants.

FINDINGS

The analysis of students' written work generated three major themes that describe their emerging critical writing skills within the Problem-Based Learning (PBL) context. These themes relate to (1) students' ability to identify and formulate a research problem, (2)

their capacity to construct arguments and use supporting evidence, and (3) their ability to demonstrate critical reflection by articulating implications.

Identifying and Formulating a Research Problem

Students' introductory sections revealed varying levels of ability in identifying and framing a research problem. While all students selected a topic related to classroom or societal issues, the precision and analytical framing differed considerably. Some students presented broad or descriptive issues, whereas others formulated clearer, more focused problem statements that provided a stronger foundation for subsequent argument development. To illustrate this range, Table 1 presents the distribution of students' problem-formulation features.

Table 1. Students' Problem Identification and Formulation

Student Topic Identified		Clarity of Problem Formulation	Analytical Orientation	Representative Excerpt
R1	Gadget use in learning	Broad and unfocused	Absent	"There are good and bad influences of gadgets on children..."
R2	Knowledge acquisition	General idea; lacks specificity	Minimal	"Knowledge is very important in people's lives..."
R3	Digitalisation of learning	Moderately clear; contextual	Present	"Gadget use is changing handwriting into typewriting..."
R4	Gadget addiction	Clear but descriptive	Weak	"Children are very addicted to gadgets..."
R5	Cocomelon phenomenon	Two-sided issue; analytically promising	Present	"Weighing the advantages and disadvantages..."
R7	Independent learning routines	Very general	Absent	"Learning cannot be separated from education..."
R10	Gadget effects	Categorised problem framing	Present	"The effect of gadgets... should be divided into positive and negative..."

As shown in Table 1, student performance ranges from very general descriptive statements (e.g., R1, R2, R7) to more structured and analytically oriented formulations (e.g., R3, R5, R10). Students with clearer problem framings tended to categorise, contextualise, or contrast aspects of the issue, demonstrating an emerging understanding of how to orient readers to the central focus of the essay. In contrast, students who presented overly general statements showed difficulty establishing a clear problem space, which limited the direction of their subsequent arguments. Overall, the findings indicate uneven readiness in producing introductory problem statements, with some students showing beginning analytical awareness while others remained at a descriptive level.

Theme 2: Constructing Arguments and Integrating Evidence

The second theme concerns students' ability to articulate justified arguments supported by examples or evidence. While all students expressed a stance on their chosen

issues, their essays varied substantially in the presence and clarity of supporting reasons. Evidence integration was particularly limited, with most students drawing on personal experience or general observations rather than substantive supporting details. Table 2 provides an overview of the argumentative features identified across students' texts.

Table 2. Argumentation and Evidence Integration

Student	Argument Orientation	Justification Provided	Evidence Integration	Analytical Depth	Representative Excerpt
R1	General stance	Minimal	None	Low	"Gadgets have good and bad influences..."
R3	Clear stance	Present	Anecdotal	Medium	"Gadgets change handwriting into typewriting..."
R4	Implied stance	Weak	None	Low	"Children are very addicted to gadgets..."
R5	Balanced stance	Present	General examples	Medium	"It has both advantages and disadvantages..."
R8	Strong stance	Clear reasons	Emerging evidence	Medium-High	"Teachers should give clear instructions..."
R10	Organised stance	Some reasoning	Minimal	Medium	"The effects can be divided into positive and negative..."
R11	Assertive stance	Some reasoning	None	Medium	"Parents should limit gadget use..."

As indicated in Table 2, students demonstrated varying degrees of argumentative development. Several students relied on assertions without elaboration (e.g., R1, R4), while others demonstrated early signs of argumentative reasoning by providing explanations or categorisations (e.g., R3, R5, R10). A few students, such as R8, provided clearer justification supported by simple examples, reflecting more advanced performance within the group. However, consistent across nearly all essays was the limited use of supporting evidence, suggesting that students were still learning how to substantiate claims beyond personal experience. These findings highlight the emerging, yet still incomplete, nature of students' argument construction skills.

Theme 3: Demonstrating Critical Reflection and Drawing Implications

The final theme concerns students' ability to conclude their essays with reflective insights or practical implications. Reflection depth varied substantially, with only a small number of students offering specific or actionable suggestions. Most students provided general or repetitive closing statements that did not extend the discussion meaningfully. Table 3 summarises the distribution of reflective and implication-making features.

Table 3. Critical Reflection and Implication-Making

Student	Presence of Reflection	Implication/Recommendation	Reflective Depth	Representative Excerpt
R1	Minimal	None	Low	"Gadgets have good and bad effects..."

Student	Presence of Reflection	Implication/ Recommendation	Reflective Depth	Representative Excerpt
R3	Present	General suggestion	Medium	"Students should use gadgets wisely..."
R4	Minimal	None	Low	"Children are addicted to gadgets..."
R5	Present	Balanced implication	Medium	"We should consider both advantages and disadvantages..."
R7	Absent	None	Low	"Learning cannot be separated from education..."
R8	Clear reflection	Concrete recommendation	Medium-High	"Teachers should guide students to use technology properly..."
R10	Present	General implication	Medium	"We must know the positive and negative effects..."
R11	Present	Simple recommendation	Medium	"Parents should limit gadget use..."

As shown in Table 3, reflective performance ranged from minimal to moderately developed. Students such as R8 demonstrated the strongest reflective thinking, offering specific and actionable recommendations. Others provided general statements that acknowledged the importance of the issue but lacked deeper evaluative insight. Several students repeated earlier points or offered overly broad statements, suggesting limited awareness of how to conclude an argumentative essay effectively. These findings show that while students understood the expectation to provide concluding reflections, many had not yet developed the rhetorical strategies required to articulate implications at a more advanced level.

DISCUSSION

The findings of this study demonstrate that Problem-Based Learning (PBL) plays a meaningful, though uneven, role in fostering students' emerging critical writing skills. The data reveal that PBL helped students begin to articulate a research problem, construct arguments, and offer reflective implications. However, the degree of sophistication across these dimensions varied considerably, suggesting that while PBL can create productive conditions for critical writing, students require sustained instructional support to fully internalise the analytical processes expected in academic writing.

Identifying and Formulating a Research Problem

The first theme showed notable disparities in students' ability to select and formulate a researchable problem. Students positioned at the lower end of performance (e.g., R1, R2, R7) produced broad or descriptive statements that lacked analytical orientation, a pattern consistent with earlier research indicating that novice writers often struggle to distinguish between a topic and a problem (Wingate, 2012; Chason et al., 2017). In contrast, higher-performing students (e.g., R3, R5, R10) demonstrated greater precision by contextualising the issue, categorising problem dimensions, or signalling a clear direction for discussion. Such findings resonate with Nosich's (2022) argument that critical writing begins with the

ability to formulate a significant question or problem because this initial framing shapes the logic and coherence of the entire composition.

In the context of PBL, the students' variability reflects different levels of cognitive engagement with the problem-framing stages emphasised in PBL cycles, specifically, exploring the issue, identifying knowledge gaps, and defining the problem (Hmelo-Silver & Barrows, 2006). Students who adhered more closely to these steps produced clearer problem statements, suggesting that PBL's problem-orientation supported early analytical behaviours. However, those who resorted to descriptive statements may not yet have internalised the epistemic function of problem formulation. This aligns with Liu and Pásztor's (2022) meta-analysis showing that PBL can enhance higher-order thinking, but its impact depends heavily on students' prior knowledge and metacognitive readiness.

Constructing Arguments and Integrating Evidence

The second theme showed that students were able to express opinions but struggled to substantiate them with robust reasoning or evidence. Most arguments relied on personal observations or general statements, a pattern widely documented in research on EFL learners' academic writing (Grabe & Zhang, 2013; Liu & Stapleton, 2014). Although some students demonstrated initial attempts at analytical categorisation (e.g., dividing effects into positive and negative), the lack of textual evidence or elaborated reasoning indicates limited control of argumentative conventions.

This outcome can be partly attributed to the early stage of PBL implementation. According to Kumar and Refaei (2017), PBL has the potential to deepen argumentation by prompting learners to investigate evidence, examine perspectives, and justify solutions. However, students require explicit modelling and guided practice to translate problem exploration into analytically grounded written arguments. The present study suggests that while students participated in problem-exploration activities, many had not yet developed the rhetorical strategies to embed evidence effectively within academic prose. This reaffirms findings by Shum et al. (2016), who argue that argumentation requires iterative scaffolding in both cognitive and linguistic domains. Nevertheless, some students did show emerging analytical awareness, particularly R5, R8, and R10, by offering balanced views, providing illustrative examples, or structuring arguments around identifiable categories. These instances support the claim that PBL can stimulate comparative and evaluative reasoning (Thorndahl & Stentoft, 2020), even among novice writers. The challenge lies not in students' lack of opinions but in their still-developing ability to justify them through systematic reasoning, evidence selection, and elaboration.

Demonstrating Critical Reflection and Implication-Making

The third theme revealed that students' reflective concluding sections varied from minimal restatements to moderately developed implications. Only a minority of students demonstrated the rhetorical maturity needed to articulate actionable or evaluative insights, echoing earlier studies showing that students often struggle with reflection and synthesis in argumentative genres (Woodhouse & Wood, 2022; Gedde-Dahl et al., 2022). This is unsurprising, as critical reflection requires learners to move beyond reporting to evaluating, integrating, and projecting discursive moves that typically develop later in academic writing proficiency.

Within the PBL framework, reflective writing should ideally emerge from cycles of inquiry, hypothesis testing, discussion, and evaluation (Moallem, 2019). Students who engaged more deeply with these processes tended to produce stronger reflective statements, suggesting that the iterative decision-making embedded in PBL may help cultivate reflective dispositions. However, most students' reflections remained generalised, indicating a need for more explicit instructional support in making implications visible, concrete, and analytically connected to prior arguments. The findings thus align with research showing that critical reflection develops when learners are guided to examine the consequences of their reasoning and articulate how their analysis informs broader conclusions (Abdelrahim, 2023; Ahmed, 2023). In the present study, only a few students demonstrated this capacity, suggesting that PBL alone is not sufficient; rather, PBL must be paired with explicit rhetorical instruction and modelling of reflective thinking.

Taken collectively, the findings affirm that PBL can initiate foundational elements of critical writing, problem identification, argument construction, and reflective thinking, but students' performances remain uneven and emergent. This supports the claim by Marashi and Akbar-Hosseini (2017) that critical writing is an accumulative cognitive practice requiring iterative feedback, explicit instruction, and sustained engagement with complex problems. PBL creates the conditions for inquiry, but these conditions must be reinforced with writing-specific scaffolds such as modelling, guided analysis, and explicit teaching of argumentative and reflective structures. The study also offers insight into a broader pedagogical implication: students' critical writing skills depend not only on their cognitive engagement with problems but also on their linguistic resources, genre awareness, and metacognitive regulation. As argued by Sholihah and Lastariwati (2020), problem-based instruction enhances critical and problem-solving skills only when accompanied by explicit attention to textual organisation and reasoning patterns. Without such support, students may recognise problems and express opinions but remain unable to articulate analysis in academically rigorous ways.

Thus, the study contributes to growing evidence that PBL has considerable potential to improve critical writing in EFL contexts (Jumariati & Sulisty, 2017; Kök & Duman, 2023), but its success depends on structured implementation, sustained practice, and complementary instruction in academic writing conventions. For PBL to fully actualise its benefits, students must be taught not only how to engage with problems but also how to translate analytical thinking into coherent, evidence-based written discourse.

CONCLUSION

This study examined how Problem-Based Learning (PBL) facilitates the development of students' critical writing skills, focusing on their ability to formulate research problems, construct arguments, and articulate reflective implications. The findings indicate that PBL effectively activates foundational cognitive processes necessary for critical writing by immersing students in real issues that require inquiry, categorisation, and evaluation. Students demonstrated emerging competencies in identifying researchable issues and organising ideas, suggesting that PBL can stimulate early analytical engagement. However, the performances varied considerably, particularly in the sophistication of argumentation and the ability to construct evidence-based reasoning. These disparities highlight that while PBL creates supportive conditions for critical engagement, novice writers still require

systematic scaffolding in academic writing conventions, explicit modelling, and sustained opportunities for practice.

The study affirms that PBL holds significant potential as a pedagogical approach for strengthening critical writing in EFL contexts, yet it cannot operate as a stand-alone solution. Its effectiveness depends on thoughtful integration with explicit instruction in argument structure, evidence use, reflective reasoning, and genre awareness. Instructional designs that intentionally combine PBL with guided writing support are therefore essential for enabling students to translate problem-oriented thinking into coherent, academically rigorous written discourse. The findings underscore the need for further research on long-term PBL implementation and on instructional strategies that optimise the development of critical writing, particularly in settings where students may have limited prior exposure to analytical writing tasks. Strengthening this pedagogical synergy has the potential to enhance not only students' writing performance but also their broader analytical and reflective capacities as emerging academic thinkers.

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