

Transforming Writing Education: An Investigation of Students' Experiences with Project-Based Learning in Teaching Writing

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ABSTRACT

In response to the pedagogical shift toward more authentic and student-centered learning in higher education, this study investigates the integration of Project-Based Learning (PjBL) in teaching academic writing to English education students in Indonesia. While PjBL has been recognized for fostering collaboration and critical thinking, limited research has explored how students behaviorally, emotionally, and cognitively respond to its implementation in writing instruction. Addressing this gap, a qualitative case study was conducted involving twenty university students who participated in a semester-long PjBL-based writing course. Drawing on data from observations, interviews, and document analysis involving twenty English education students, this study reveals three key findings. Behaviorally, students demonstrated active participation, leadership, and collaborative responsibility, supported by structured peer roles and group accountability mechanisms, although a few exhibited passive involvements due to unequal workload distribution. Emotionally, most students experienced enthusiasm and a sense of accomplishment, particularly during topic selection and final submission, but some expressed anxiety related to public presentation and frustration over imbalanced team contributions. Cognitively, students showed marked improvements in brainstorming, organizing arguments, and revising drafts, guided by visual tools, feedback, and reflective journaling, which enhanced their critical thinking and writing cohesion. These findings highlight PjBL as a transformative pedagogy that fosters technical skills, autonomy, emotional resilience, and cognitive engagement. By offering an integrated view of students' experiences, the study advocates for strategies that support collaboration, emotional support, and metacognitive awareness in academic writing, with broader implications for advancing student-centered learning in higher education.

1. Introduction

The rapid evolution of educational practices has called for more authentic and student-centered approaches, particularly in the teaching of writing in higher education. Traditional methods, which often rely on teacher-centered instruction and repetitive exercises, tend to fall short in developing learners' abilities to communicate effectively and think critically. In contrast, Project-Based Learning (PjBL) has emerged as an engaging alternative that encourages students to explore writing as a form of active inquiry, expression, and collaboration. Scholars have acknowledged that PjBL not only improves

writing performance but also supports critical thinking, creativity, and autonomy (Lengkoan et al., 2024; Lengkoan & Hampp, 2022; Copeland, 2012).

In the context of English language teaching, especially in English as a Foreign Language (EFL) settings, PjBL provides students with opportunities to experience writing in real-world scenarios. Through project assignments, learners engage with various writing purposes such as argumentation, explanation, description, and reflection (Raimes, 1983; Gebhart, 1977). These diverse purposes help students to understand writing not merely as an academic skill but as a tool for meaningful communication. As higher education increasingly demands that students

produce coherent and context-sensitive writing, PjBL aligns with this goal by enabling learners to work collaboratively, apply knowledge practically, and reflect on their learning experiences.

Numerous studies have confirmed the potential of PjBL to enhance student engagement and academic achievement. For instance, [Barron and Chen \(2008\)](#) highlighted how complex, inquiry-driven projects yield realistic products that improve learning outcomes. Similarly, [Chadafi and Syarifudin \(2021\)](#) implemented structured stages of PjBL, starting from identifying essential questions to evaluating final reflections. The literature collectively suggests that successful PjBL encompasses not only a well-structured design but also fosters autonomy among students, enabling them to take ownership of their learning journey ([Grossman et al., 2019](#)). This autonomy empowers learners to take active ownership of their educational experiences, thereby deepening engagement and promoting self-directed learning ([Grossman et al., 2019](#)). [Usmeldi \(2019\)](#) provides further evidence of PjBL's efficacy, highlighting its significant role in enhancing student competencies, particularly in terms of motivation, creativity, and critical thinking. In addition, [Kisaalita et al. \(2022\)](#) argue that reflective practices are fundamental to the PjBL approach, as they support students in applying classroom-acquired knowledge to practical, real-world contexts. This perspective is further reinforced by [Peñaloza and Salamanca \(2020\)](#), who stress the importance of cultivating a classroom environment that prioritizes feedback and encourages continuous improvement. Such a culture, they contend, is essential for developing student agency and supporting lifelong learning habits.

Research exploring students' emotional, behavioral, and cognitive responses to PjBL remains relatively scarce, particularly in Indonesian higher education. Several scholars have examined general perceptions of teaching methods or learning environments, but few have delved deeply into how students respond to writing instruction that is project-based in nature ([Soled et al., 2020](#); [Saputri & Indriayu, 2018](#); [Hwang et al., 2015](#)). [Many and Wiseman \(1992\)](#) and [Nielsen et al. \(2013\)](#) noted the role of affective engagement in learning, but their work does not focus specifically on writing. Moreover, [Liando et al. \(2022; 2023\)](#) identified challenges students face when constructing arguments and organizing ideas, yet the studies did not examine PjBL as a pedagogical tool. These gaps underscore the need to explore how students experience PjBL holistically, considering not only their learning outcomes but also their motivational levels, attitudes, and peer interactions.

This study seeks to address these gaps by examining how university students enrolled in an English education program respond to the implementation of PjBL in teaching writing. The novelty of this research lies in its focus on capturing

students' multifaceted experiences, including emotional engagement, cognitive development, and behavioral participation. Rather than treating students as passive recipients of instruction, this study foregrounds their perspectives as essential to evaluating the effectiveness of PjBL. It contributes to the growing body of literature by offering insights into how writing skills, self-regulation, collaboration, and motivation are interwoven in project-based tasks.

The significance of this study is rooted in its potential to inform pedagogical practices and curriculum development. By investigating students' reflections, behaviors, and learning outcomes, this research aims to provide educators with evidence-based recommendations for integrating PjBL into writing instruction. The study also intends to highlight how different stages of project implementation, such as designing, scheduling, revising, and presenting, can influence the depth of student learning. Ultimately, the study aspires to support the creation of writing environments that are student-centered, goal-oriented, and contextually meaningful.

By investigating students' responses to PjBL in the context of writing instruction, this study contributes to the broader field of English language teaching. It underscores the importance of integrating pedagogical strategies that not only teach writing mechanics but also inspire learners to think critically, work collaboratively, and write purposefully. The findings are expected to benefit curriculum designers, language educators, and institutions committed to promoting more engaging and transformative learning experiences in writing classrooms.

2. Literature Review

2.1 Behavioral Responses to Project-Based Learning in Writing Instruction

Behavioral responses refer to students' observable actions and participation patterns during learning activities. In writing instruction, these responses include collaboration, punctuality in task completion, initiative in group discussions, and consistency in contributing to project milestones. The integration of Project-Based Learning (PjBL) has been recognized for enhancing these forms of active participation. Studies by [Barron and Chen \(2008\)](#), [Chadafi and Syarifudin \(2021\)](#), and [Steenhuis and Roland \(2018\)](#) have documented that PjBL promotes student engagement by assigning real-world tasks that demand coordinated group work and time management.

Additionally, research suggests that students involved in PjBL demonstrate heightened initiative and responsibility when they are directly involved in decision-making processes, such as determining timelines or defining their writing topics ([Sukerti & Yuliantini, 2018](#)). However, these studies have largely focused on general outcomes and have not closely

examined how specific behaviors emerge in response to the demands of writing tasks. For example, few have analyzed the behavioral shifts that occur as students transition between planning, drafting, revising, and presenting their work. This gap in the literature leaves unexplored how sustained behavioral engagement is cultivated across all phases of writing within PjBL frameworks.

This study offers a new perspective by observing how students behave throughout each stage of PjBL, especially in the context of academic writing. It also examines the potential of PjBL to improve behavioral consistency by encouraging ownership and peer collaboration. The implications of this investigation may inform teaching practices by helping educators structure writing tasks that naturally elicit positive behavioral engagement, thereby strengthening the overall quality of writing instruction in higher education.

2.2 Emotional Responses to Project-Based Learning in Writing Instruction

Emotional responses reflect students' internal feelings and attitudes toward the learning experience, including enjoyment, anxiety, confidence, and frustration. These affective dimensions significantly influence students' willingness to participate and their long-term motivation to improve writing skills. According to [Soled et al. \(2020\)](#) and [Turan and Meral \(2018\)](#), positive emotional engagement can lead to deeper learning and stronger commitment to tasks. Similarly, [Hwang et al. \(2015\)](#) and [Many and Wiseman \(1992\)](#) have shown that emotionally resonant learning environments foster persistence and greater enthusiasm for academic tasks.

PjBL is often associated with enhanced emotional engagement due to its authentic, learner-centered nature. Students working on meaningful writing projects tend to feel more connected to their learning and express increased satisfaction with the outcomes. At the same time, the emotional responses to PjBL are not universally positive. Challenges such as unclear expectations, difficulties in group collaboration, or discomfort with peer evaluation can lead to stress or diminished interest ([Nielsen et al., 2013](#); [Denton et al., 2008](#)). Despite these observations, research on the emotional aspects of PjBL in writing education remains limited, especially in the context of Indonesian higher education where academic writing is perceived as a high-stakes and demanding skill.

This study addresses this gap by focusing on the emotional journey students experience while engaging in PjBL for writing instruction. By capturing both the supportive and challenging aspects of students' emotional responses, the research provides a more complete understanding of how PjBL can affect students' attitudes toward writing. The findings are expected to guide educators in creating emotionally

responsive instructional designs that promote confidence and motivation while minimizing stress and disengagement in writing tasks.

2.3. Cognitive Responses to Project-Based Learning in Writing Instruction

Cognitive responses encompass the mental processes involved in learning, including idea generation, problem-solving, critical thinking, and knowledge construction. In the context of writing, cognitive engagement includes planning content, structuring arguments, revising drafts, and reflecting on the writing process. PjBL naturally encourages such mental involvement by situating students in tasks that require critical analysis, synthesis of information, and evaluation of multiple perspectives. The collaborative inquiry and authentic nature of PjBL are particularly suited to developing these cognitive dimensions.

Despite this potential, existing research often neglects how students cognitively respond to the complexities of writing within a PjBL setting. While [Liando et al. \(2022\)](#) and [Liando et al. \(2023\)](#) revealed that students struggle with argumentative writing due to limited exposure to rhetorical strategies and evidential reasoning, their studies did not examine how PjBL might facilitate deeper cognitive development. Other works by [Gebhart & Mollendorf, \(1977\)](#), [Raimes \(1983\)](#), and [Setyowati et al. \(2019\)](#) emphasize the need for a structured approach to teaching writing, including clarity of purpose and coherence in text development, but seldom explore how PjBL scaffolds these cognitive tasks through group-based learning and self-reflection.

This study contributes a novel lens by viewing students' cognitive development not as isolated mental exercises but as processes shaped by the social and instructional environment of PjBL. It investigates how students plan, evaluate, and revise their writing when immersed in extended projects that require critical thinking and collaborative inquiry. The implications of this focus are far-reaching, as it supports the integration of explicit cognitive strategies into writing instruction. These may include guided reflections, structured peer feedback, and project debriefs that allow students to internalize and transfer their learning across contexts.

3. Method

This study adopted a qualitative case study design to investigate students' responses to the implementation of Project-Based Learning (PjBL) in the context of teaching writing. The use of a qualitative approach enabled an in-depth exploration of students' behavioral, emotional, and cognitive experiences, allowing for a detailed understanding of how learners engage with writing tasks within an authentic instructional environment. [Patton \(2015\)](#) emphasized that qualitative research is suited for

exploring how individuals make sense of their experiences, while [Yin \(2018\)](#) explained that a case study is ideal for examining a phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly defined. Accordingly, this research sought to understand how students navigated their learning journey within a PjBL framework by examining their perspectives, actions, and interactions during the writing process.

3.1 Participants and Research Site

The study was conducted at a higher education institution in Indonesia, specifically within the English Education Department. The participants consisted of twenty students selected through purposive sampling, based on their enrollment in a writing course that had adopted PjBL as the core instructional strategy. These students were deemed appropriate for the study due to their direct engagement with the writing projects and their ability to provide rich reflections on the learning experience. The inclusion criteria ensured that all participants had sufficient exposure to the full implementation of the PjBL model throughout the semester, which allowed for meaningful insights to be gathered on their responses across multiple stages of the project.

3.2 Data Collection Techniques

Multiple data collection methods were employed to ensure triangulation and enhance the credibility of the findings. The instruments used included document analysis, interviews, and classroom observations. The use of varied techniques was guided by the need to capture different dimensions of students' learning experiences and to validate the findings through cross-verification.

First, documentation was collected in the form of lesson plans, writing project guidelines, student work samples, and assessment rubrics. These documents provided contextual information on the structure, expectations, and outputs of the PjBL activities. Second, semi-structured interviews were conducted with all twenty participants to gather detailed narratives of their behavioral, emotional, and cognitive responses to the writing projects. The interview format allowed for open-ended responses while maintaining consistency in the areas explored. Third, classroom observations were carried out over the course of the semester to record real-time interactions, student engagement patterns, and teacher facilitation strategies. Observational notes focused on indicators of participation, collaboration, affective engagement, and cognitive involvement during PjBL activities.

3.3 Data Analysis Procedures

The data collected were analyzed through thematic analysis, content analysis, and document analysis.

Thematic analysis was used to identify recurring patterns and themes within students' responses, which were categorized into three domains: behavioral, emotional, and cognitive. This method enabled the researcher to interpret meaning across the different data sources systematically. Content analysis was applied to the interview transcripts and observation notes to extract key phrases, behaviors, and emotional expressions that reflected the students' learning experiences. Document analysis served as a complementary technique, providing background information and contextual validation of the practices observed in the classroom.

3.4 Ethical Considerations

Throughout the research process, strict adherence to ethical standards was ensured to uphold the integrity of the study and protect the rights of participants. Prior to data collection, informed consent was obtained from all participants, with clear explanations provided regarding the study's objectives, procedures, and their rights as research subjects. Participants were explicitly assured of the confidentiality of their responses and the anonymity of their identities, and they were informed that their involvement was entirely voluntary, with the option to withdraw from the study at any stage without facing any negative consequences. To safeguard privacy, pseudonyms were used in all documentation and reporting of the findings. Consistent with ethical guidelines articulated by [Cropley \(2022\)](#) and [Roell \(2019\)](#), the research was conducted with a strong commitment to respecting participants' autonomy and ensuring their comfort. Every effort was made to foster a safe, inclusive, and respectful research environment that encouraged honest and reflective participation.

4. Results

The findings of the study confirm that Project-Based Learning (PjBL) effectively promotes a high level of behavioral engagement among students in writing instruction. The structured learning environment, underpinned by clearly articulated expectations in lesson plans and supported by detailed evaluation rubrics, fostered a strong sense of accountability and responsibility among the participants. Students responded positively to the defined roles and collaborative processes embedded within the PjBL framework. However, the emergence of passive behavior in a small subset of students indicates that collaborative instructional models must also incorporate proactive monitoring and tailored support strategies. Introducing tools such as peer accountability rubrics and weekly progress tracking can play a crucial role in mitigating disengagement and ensuring equitable participation. Overall, the implementation of PjBL created a dynamic and responsive platform that encouraged student initiative, peer interaction, and a shared sense of responsibility,

ultimately enhancing the quality and effectiveness of

4.1. Behavioral Responses

In the context of Project-Based Learning (PjBL), behavioral responses refer to students' observable actions and levels of participation that signal their engagement with writing tasks. These behaviors include leadership, collaboration, punctuality in task completion, and peer interaction during group work. Monitoring behavioral indicators provides critical

the writing instruction.

insights into how learners respond to instructional demands and social dynamics. This study analyzed students' behavioral engagement by combining observational data, project documentation, and interview responses. The summary is presented in the following table.

Table 4.1 Summary of Behavioral Responses

Behavioral Indicator	Frequency (out of 20 students)	Observable Actions
Active participation	17	Leading discussions, posing questions
Collaborative engagement	15	Sharing ideas, dividing roles equitably
Task responsibility	16	Submitting drafts and final work on time
Passive involvement	3	Withdrawing from group interaction

Observational records indicate that seventeen students consistently participated in project discussions, volunteered to present ideas, and initiated collaboration. According to the writing project guidelines, students were tasked with proposing group topics and creating timelines, which they largely completed with enthusiasm. Lesson plans also included rotating leadership roles, ensuring that each member had the opportunity to coordinate tasks, lead meetings, or report progress. Students were rated through peer collaboration rubrics that captured both task completion and leadership. One student noted, *"Everyone had to lead at some point, so we had to step up and guide the group. It made me more confident in expressing my thoughts"* (Student 5, Interview Transcript T-5/1). This indicates that the PjBL framework not only encouraged participation but also nurtured personal initiative and leadership development.

Collaborative engagement was demonstrated by fifteen students who actively contributed during brainstorming, drafting, and revision phases. Observational notes and collaborative writing logs revealed that most groups divided tasks equitably, such as conducting research, outlining, and editing. In several cases, students expressed a sense of ownership over their group's progress and outcomes. One participant reflected, *"We each knew our part, and when someone struggled, we helped. It wasn't just about getting it done, it felt like we were building something together"* (Student 8, Interview Transcript T8/4). These sentiments align with rubric data, which consistently rated the majority of students as "highly

collaborative" based on peer evaluations and instructor feedback.

In terms of task responsibility, sixteen students submitted drafts and final work on time, often exceeding minimum expectations by including additional research or edits. Project documentation such as progress trackers and peer review forms confirmed that most students adhered to deadlines. Only three students were identified as displaying passive involvement. These individuals withdrew from group discussions, contributed minimally to shared tasks, and were noted in peer evaluations for inconsistent effort. These behaviors were also reported in interviews by group members who described unequal task distribution as a challenge. Despite the presence of passive tendencies, proactive peer interventions helped maintain group cohesion and project momentum.

These results confirm that PjBL encourages a high level of behavioral engagement in writing instruction. The structure of the learning environment, reinforced by clearly defined expectations in the lesson plans and evaluation rubrics, helped establish a sense of accountability among students. Interview data further suggest that students perceived these expectations as fair and motivating, especially when roles and responsibilities were transparently communicated and regularly reviewed.

This study offers an original interpretation by showing that behavioral engagement in PjBL is not merely task compliance but reflects evolving patterns of initiative, social responsibility, and group

coordination. When supported by consistent scaffolding and assessment transparency, students are more likely to internalize expectations and take active ownership of their learning process. These findings also highlight the importance of integrating behavioral scaffolds, such as role rotations, peer feedback protocols, and progress monitoring tools, to sustain participation and discourage passivity. In this way, PjBL emerges as both an instructional strategy and a behavioral development tool that prepares students to function effectively in collaborative academic and professional settings.

4.2. Emotional Responses

Emotional responses play a critical role in students' engagement with writing tasks, influencing their motivation, self-efficacy, and overall classroom experience. In the context of Project-Based Learning (PjBL), these affective responses are shaped not only by the writing activities themselves but also by the dynamics of collaboration, assessment practices, and instructional support. This study explored the emotional dimensions of students' experiences to better understand the ways in which PjBL fosters or inhibits their psychological engagement with academic writing. The findings are summarized in the following table and elaborated in the subsequent analysis using insights from interviews, observations, project documents, and student-produced reflections.

Table 4.2 Emotional Responses During PjBL

Emotional Response	Frequency (out of 20 students)	Manifestations Observed
Enthusiasm and enjoyment	14	Expressed motivation during topic selection
Stress and anxiety	6	Hesitation during presentations
Sense of accomplishment	13	Positive reflections on the final product
Interpersonal frustration	4	Discomfort with unequal group contribution

The data show that enthusiasm and enjoyment were prominent among fourteen students, especially during the initial topic selection and brainstorming phases. These stages, as outlined in the project guidelines, emphasized student autonomy and encouraged personal relevance by allowing groups to choose real-world issues for exploration. This freedom created a strong sense of ownership, which students identified in interviews as a source of motivation and enjoyment. One student shared, *"When we got to choose our topic, it didn't feel like a school task anymore. It felt like something we wanted to write about, something we cared about"* (Student 2, Interview Transcript T-2/3). Lesson plans included headline analysis and media searches as introductory activities, which students found energizing and creative. Observational records further noted that during these stages, students exhibited high energy levels, willingly engaged in peer discussion, and demonstrated excitement about developing their ideas.

Despite this positive emotional tone, six students expressed feelings of anxiety, especially when delivering presentations or facing tight deadlines. According to the assessment rubric, equal weight was given to presentation content, delivery style, and responsiveness to audience feedback. For students with limited public speaking experience, this assessment structure increased emotional pressure. Classroom observations during the presentation phase

recorded physical signs of nervousness, including long pauses, avoidance of eye contact, and reliance on prepared scripts. These stress reactions were corroborated by written reflection logs in which students shared their fears of being judged or letting down their group members. One student admitted, *"I was fine with writing, but presenting in front of the class made me so nervous. I kept thinking I would mess up and disappoint my team"* (Student 7, Interview Transcript T-7/2). Such sentiments reflect the emotional demands placed on students when performance is public and collaborative.

Thirteen students expressed a deep sense of accomplishment after completing the final project. Reflection entries revealed pride in their written outputs and satisfaction with their growth as writers. Student work samples, particularly final essays, showed clear improvement in organization, clarity, and vocabulary. These gains were recognized not only in student self-reflections but also in the project rubrics, which documented upward trends in writing quality between the first and final drafts. One notable source of student pride was the compilation of final essays into a digital booklet shared with the class, which served as a tangible representation of their academic achievement. Students often referred to this product in their journals as a symbol of collective success and individual growth.

However, emotional challenges were also reported by four students who experienced frustration stemming from unequal participation within groups. Project documentation and peer evaluation sheets highlighted that in some teams, one or two members took on a disproportionate share of the work. Interview responses echoed this concern, as some students expressed feelings of being burdened or undervalued. For instance, *“It felt unfair sometimes because I ended up doing most of the writing. We had roles, but not everyone took them seriously”* (Student 11, Interview Transcript T-11/3). Although group roles were assigned in the early stages and monitored through progress checklists, it became evident that emotional strain from perceived inequity persisted throughout the project. These experiences point to the need for consistent role enforcement and conflict mediation mechanisms in group-based learning.

The triangulated data illustrate that while PjBL creates emotionally rich and engaging writing experiences, it also introduces affective complexities. These range from heightened motivation to interpersonal tension and performance stress. When implemented with supportive instructional strategies, PjBL can foster meaningful emotional investment and personal growth. The project structure, autonomy in topic selection, and opportunities for reflection contributed positively to students’ sense of fulfillment. At the same time, the emotional strain associated with collaboration and performance expectations must not be overlooked.

This study contributes an original interpretation by positioning emotional response as a dynamic, evolving element within writing pedagogy, shaped by both internal student perceptions and external classroom structures. PjBL, when designed with emotional literacy in mind, becomes more than a cognitive exercise. It transforms into an affective journey that challenges and empowers learners. The findings affirm that to maximize the benefits of PjBL in writing instruction, educators must embed consistent emotional scaffolding, promote equity within group work, and cultivate safe spaces for expression and reflection. These strategies not only support students’ emotional well-being but also enhance their willingness to engage, take risks, and grow as confident writers.

4.3. Cognitive Responses

Cognitive engagement represents a core indicator of meaningful learning in writing instruction, particularly when students are challenged to think critically, plan effectively, and reflect on their work. This study explored the cognitive responses of students as they engaged in various stages of a Project-Based Learning (PjBL) writing framework. Through data triangulation using interviews, observations, project documents, and assessment artifacts, the analysis sheds light on how students used mental strategies to transform writing from a routine task into a structured, reflective, and analytical process. The summary of cognitive strategies is presented in the table below.

Table 4.3. Cognitive Strategies Used by Students

Cognitive Process	Frequency (out of 20 students)	Evidence from Practice
Brainstorming and ideation	18	Pre-writing logs, visual mind maps
Critical thinking	15	Logical arguments and use of relevant evidence
Planning and organizing	16	Structured outlines and coherent paragraphs
Reflection and revision	13	Revisions based on peer and lecturer feedback

The data show that eighteen students actively participated in brainstorming sessions using guided prompts and graphic organizers provided by the lecturer. These tools were aligned with the pre-writing activities outlined in the lesson plans and helped students identify topics, frame central ideas, and map out supporting arguments. The use of visual tools such as mind maps and thematic clusters was particularly effective for generating cohesive ideas before the writing process began. As one participant explained, *“The brainstorming phase really helped me to think about the issue from different sides. Drawing it out*

made my ideas clearer before I even started writing” (Student 4, Interview Transcript T-4/2). This response illustrates how ideation was not only facilitated through tools but also internalized as a meaningful thinking process.

Critical thinking emerged as a dominant theme among fifteen students who were able to construct logically sequenced arguments supported by relevant evidence. This was especially evident in the argumentative essays produced during the final stage of the project. Analysis of student work samples

revealed the presence of well-formulated thesis statements, followed by structured body paragraphs containing reasoned claims and illustrative examples. Assessment rubrics further confirmed that most students performed well in the “argument clarity” and “evidence support” categories, indicating that their cognitive reasoning had matured throughout the course of the project. One student reflected on this development, stating, *“At first, I just gave my opinion, but after feedback, I realized I had to prove it with real examples and logic. That was a turning point in my writing”* (Student 9, Interview Transcript T-9/5). This highlights a clear shift from opinion-based to evidence-based reasoning, prompted by the recursive nature of the PjBL design.

Sixteen students demonstrated organized thinking through the creation of outlines, which served as scaffolds for drafting their essays. These outlines were submitted as required components of the writing project and reviewed by the lecturer before students proceeded to full drafts. This stage was crucial in reinforcing the importance of structure and cohesion, particularly for students who previously struggled with paragraph unity and content sequencing. The final essays showed a marked improvement in organization compared to earlier diagnostic tasks. This was corroborated by peer feedback forms and rubric scores that showed a progression in paragraph transitions and idea development between drafts.

The process of revision and reflection was clearly evident among thirteen students, who engaged in iterative editing after receiving peer and instructor feedback. Revised drafts included corrections related to clarity, coherence, and argumentative depth. The writing project guidelines explicitly required multiple drafts and revisions, and many students cited this requirement as instrumental in improving their work. Observational data supported this claim, noting that students frequently sought clarification and implemented changes based on rubrics and formative feedback. Reflection journals submitted at the end of the project also captured students’ thoughts on their writing evolution, with many acknowledging that their final essays were significantly shaped by the feedback and revision process.

Collectively, these findings suggest that the PjBL framework effectively supported the development of essential cognitive strategies in academic writing. Students did not merely complete assignments but engaged in deeper, strategic processes involving idea generation, content planning, argumentative construction, and recursive improvement. The alignment of instructional tools, such as brainstorming worksheets, peer review templates, and assessment rubrics, created an environment where cognitive engagement was expected and supported throughout each phase of the project.

This study offers an original interpretation of how PjBL cultivates cognitive growth in student writers. Rather than isolating writing as a product-focused activity, the project-based approach repositioned writing as a reflective, problem-solving, and collaborative process. The evidence demonstrates that when students are guided through structured inquiry, supported by iterative feedback, and provided autonomy in topic selection, they develop not only their writing proficiency but also the metacognitive awareness necessary for academic and professional success. This holistic cognitive engagement represents a key contribution of the study, illustrating that PjBL can serve as both a method of instruction and a developmental tool for independent, critical, and creative thinking in writing education.

5. Discussion

This study examined how students behaviorally, emotionally, and cognitively responded to the implementation of Project-Based Learning (PjBL) in a writing course within an Indonesian higher education setting. The findings indicate that PjBL significantly enhanced student engagement, fostered emotional resilience, and supported the development of critical cognitive strategies necessary for academic writing.

5.1 Behavioral Responses

The study revealed that the majority of students demonstrated strong behavioral engagement throughout the project. Seventeen out of twenty participants showed active participation, assumed leadership roles, and collaborated consistently during each phase of the writing process. These findings suggest that when students are entrusted with responsibility, as seen in the task of planning timelines, rotating group leadership, and reporting progress, they tend to internalize expectations and take ownership of their learning.

This aligns with earlier research which asserts that Project-Based Learning (PjBL) encourages autonomous learning and group accountability when well-structured and purpose-driven (Rauschenbach et al., 2018; Pol et al., 2008). The importance of clearly articulated feedback mechanisms, such as peer evaluation rubrics and progress checklists, has been emphasized in the literature as essential tools for maintaining accountability among team members (Mahmoud et al., 2025; Hsiao et al., 2019). These mechanisms not only enhance learners’ commitment to their projects but also foster a culture of equity and shared responsibility, enabling students to engage more meaningfully in collaborative work (Greer et al., 2018; Raška et al., 2013). For instance, studies have shown that constructive criticism derived from peer evaluations enhances students’ ability to articulate strengths and weaknesses in their work, ultimately leading to higher quality outputs and improved

learning experiences (Mahmoud et al., 2024; Stenberg et al., 2021).

5.2 Emotional Responses

The emotional landscape of students engaged in PjBL was dynamic and revealing. Fourteen students expressed excitement and enjoyment, especially during the stages involving topic selection and idea development. The autonomy to choose relevant, real-world issues and the creative freedom to shape their projects contributed to increased motivation and personal investment. This aligns with the affective benefits described in existing literature, where engaging with meaningful tasks is observed to enhance enjoyment and establish a sense of purpose in learning endeavors. This is highlighted in the work of Ruiz-Calleja et al. (2019), which emphasizes how well-structured tasks can significantly impact student motivation and emotional engagement in their coursework (Ruiz-Calleja et al., 2019). The psychological implications of such learning environments are further examined, noting that supportive structures in learning frameworks can serve to augment students' emotional responses and overall learning outcomes in diverse settings, including technology-enhanced environments (Ruiz-Calleja et al., 2019).

Conversely, findings from the current study indicated that six students reported experiencing considerable stress and anxiety associated particularly with public presentations and stringent deadlines. Such performance-related anxiety and the fear of negative judgment often culminate in increased nervousness and self-doubt, as noted by various scholars. Nielsen et al. (2013) articulate that when performance expectations exceed students' perceived capabilities, emotional burdens can intensify, diminishing the enriching potential of collaborative projects (Jing et al., 2024). Denton et al. (2008) similarly argue that while collaboration can foster learning and engagement, it can also precipitate significant anxiety when adequate emotional support structures are absent (Amir et al. (2008)). This notion is corroborated by (Jackson et al., 2017), who delve into public speaking anxiety specifically, articulating that structured interventions can mitigate these fears and allow for a reframing of apprehension surrounding public performance (Jackson et al., 2017).

Moreover, studies indicate that attention modification programs can alter cognitive expectations surrounding social interactions, such as public speaking, thus potentially alleviating anxiety for socially anxious individuals (Amir et al. (2008)). The intervention strategies identified by Amir et al. (2008) offer promising avenues for reducing anxiety symptoms, highlighting the necessity of targeted support mechanisms in educational environments. Such explorations into anxiety within collaborative frameworks highlight the complexity of the emotional

landscape students navigate in educational settings and the imperative of fostering supportive environments that address both positive and negative emotional responses during their learning journeys.

Additionally, interpersonal frustration emerged among students who felt overwhelmed by unequal task distribution. Despite the presence of assigned group roles and evaluation forms, four students expressed disappointment with peers who contributed minimally. These emotional tensions indicate that PjBL, while effective in building engagement, also introduces psychological complexities that require active emotional scaffolding. Clearer conflict resolution strategies, emotional support systems, and regular check-ins can mitigate these issues and create a safer collaborative environment.

Overall, the findings highlight that emotional responses to PjBL are multifaceted. The project's authenticity and student-centered structure foster emotional engagement, but stress factors such as peer dynamics and public performance need to be anticipated and addressed.

5.3 Cognitive Responses

The cognitive responses observed in this study provide evidence that project-based learning (PjBL) facilitates deeper learning and critical engagement with the writing process. Eighteen students actively engaged in brainstorming and idea mapping, aided by visual tools such as graphic organizers and mind maps. These instruments not only helped students formulate cohesive arguments but also allowed them to visualize their writing plans. This structured approach lays a solid foundation for organized and reflective writing, which is crucial for academic success (Rindengan & Rindengan, 2019; , Hanjani & Li, 2014).

Fifteen students demonstrated enhanced critical thinking by constructing structured arguments supported by relevant evidence. This shift from opinion-based writing to analytical and evidence-based reasoning is well-documented in educational literature, emphasizing the importance of scaffolded instructional strategies (Zuhra et al., 2022). Assessment rubrics and student interviews confirmed that the use of scaffolded writing strategies significantly bolstered students' thesis development, coherence, and argument clarity, echoing the socio-cognitive principles of writing instruction articulated by Raimes (Ikawati, 2020). These principles underscore the necessity of allowing students to operate within their zone of proximal development (ZPD), thus enhancing their writing capabilities through collaborative interaction and guided assistance (Guerrero & Villamil, 2000).

Moreover, collaborative approaches, as highlighted by Mdodana-Zide and Mafugu, show that student performance improves significantly when they engage in writing center interventions, promoting

independence and skill acquisition through collaborative strategies (Mdodana-Zide & Mafugu, 2023). This is supported by Kitjaroonchai and Phutikettrikit, who assert that peer scaffolding can significantly enhance learners' writing performance (Kitjaroonchai & Phutikettrikit, 2022). The incorporation of metacognitive strategies, as discussed by Nourazar et al., also aligns with the notion that structured instruction can foster independent critical thinking skills among learners (Nourazar et al., 2022). Thus, blending these scaffolded strategies with collaborative and metacognitive elements could result in a more robust educational framework for developing writing proficiency.

Furthermore, sixteen students effectively used outlines as structural scaffolds to organize content and ensure logical flow. Thirteen of them embraced the revision process after receiving peer and instructor feedback, which led to noticeable improvements in clarity, coherence, and lexical choice. Reflection journals confirmed that students viewed feedback as integral to their development and appreciated the recursive nature of the writing cycle.

These results suggest that PjBL offers a cognitively rich environment where students are required to apply, refine, and reflect on their knowledge through iterative practice. It transforms writing into a reflective inquiry process that nurtures both cognitive growth and academic confidence.

5.4. Study insights, gaps, novelty and Implication

Although the study provides valuable insights, it is limited by the qualitative design and the relatively small sample size, which may restrict the generalizability of the findings. The study captured student responses at a single point in time and did not assess the long-term retention or transfer of writing skills beyond the semester.

This study contributes a novel perspective by offering a comprehensive account of how behavioral, emotional, and cognitive dimensions intersect in student experiences with PjBL. Unlike previous studies that predominantly focused on performance outcomes or instructional design, this research prioritizes student voices and internal experiences as key indicators of pedagogical effectiveness (Liando et al., 2022; Hwang et al., 2015).

The results reinforce the argument that writing instruction should be integrated with collaborative inquiry, emotional scaffolding, and metacognitive reflection. Educators are encouraged to embed behavioral support mechanisms, emotional feedback loops, and cognitive scaffolds into PjBL design. Additionally, institutions should consider providing professional development and curricular flexibility to support PjBL integration into writing programs.

To extend the present findings, future research should consider longitudinal approaches that examine how PjBL affects students' writing development over time. Mixed-methods designs could offer a more comprehensive understanding of the relationship between learner engagement and academic outcomes. It is also recommended to investigate how PjBL performs across different learning environments, including online and hybrid formats. Finally, further studies could explore how student characteristics such as prior proficiency, motivation, or cultural background shape their responses to project-based writing instruction.

Moreover, task delegation is another critical factor that cultivates a sense of equity within teams. By aligning individual roles with specific project needs, students can maximize their contributions while collectively working towards a common objective (Li et al., 2019; Markula & Aksela, 2022). This approach not only supports the development of teamwork and collaboration skills but also reinforces the importance of interdependence within group dynamics, which is pivotal for achieving the intended learning outcomes (Lai, 2021). Additionally, empirical evidence suggests that peer learning mechanisms facilitate cognitive, metacognitive, and emotional development, which are essential aspects of effective learning (Morales-Trujillo et al., 2022). The combination of these strategies enables learners to navigate complex tasks more effectively, enhancing both their individual and collective performance in project-based scenarios (Sung et al., 2003; Damon et al., 2017).

However, the presence of passive involvement among a few students reflects a common challenge in collaborative settings. While most teams succeeded in maintaining equitable contributions, some experienced imbalance, suggesting a need for stronger behavioral scaffolding through individualized monitoring and clear role assignments. These findings point to the importance of integrating structured behavioral protocols within PjBL to ensure consistent participation and minimize disengagement.

6. Conclusion

This study concludes that Project-Based Learning (PjBL) significantly enhances students' engagement and development in academic writing by fostering behavioral accountability, emotional investment, and cognitive growth. Through active participation, students assumed leadership, collaborated meaningfully, and demonstrated a strong sense of responsibility, while emotionally, they expressed enthusiasm and fulfillment despite encountering stress and interpersonal challenges. Cognitively, learners developed critical thinking, structured organization, and reflective revision practices, underscoring the transformative potential of PjBL in higher education writing instruction. The novelty of this research lies in

its holistic investigation of behavioral, emotional, and cognitive responses, shifting focus from mere performance outcomes to the nuanced experiences of learners. This student-centered lens offers valuable pedagogical insights, suggesting that effective writing instruction must integrate emotional scaffolding, collaborative structures, and metacognitive strategies.

Practically, the findings advocate for the implementation of clearly defined peer roles, reflective tools, and consistent formative feedback to maximize PjBL's impact. For future research, longitudinal and mixed-method studies are recommended to explore the long-term retention and transfer of writing competencies developed through PjBL. Investigations across diverse learning environments, including online and hybrid platforms, as well as among students with varying proficiency levels and cultural backgrounds, will further enrich our understanding of PjBL's adaptability and effectiveness in fostering empowered, reflective, and proficient writers.

References

- Amir, N., Weber, G., Beard, C., Bomyea, J., & Taylor, C. (2008). The effect of a single-session attention modification program on response to a public-speaking challenge in socially anxious individuals. *Journal of Abnormal Psychology*, 117(4), 860–868. <https://doi.org/10.1037/a0013445>
- Barron, B., & Chen, M. (2008). Teaching for meaningful learning: A review of research on inquiry-based and cooperative learning. In L. Darling-Hammond (Ed.), *Powerful learning: What we know about teaching for understanding* (pp. 11–70). Jossey-Bass.
- Chadafi, M., & Syarifudin, D. F. (2021). The effectiveness of project-based learning to students' ability in writing recount text. *Journal of Languages and Language Teaching*, 9(3), 283–292. <https://doi.org/10.33394/jollt.v9i3.3914>
- Cropley, A. J. (1971). Introduction to methods. In B. R. Bloom & P. R. Glade (Eds.), *In vitro methods in cell-mediated immunity* (pp. 3–10). Academic Press. <https://doi.org/10.1016/B978-0-12-107750-1.50012-1>
- Damon, W., Callon, C., Wiebe, L., Small, W., Kerr, T., & McNeil, R. (2017). Community-based participatory research in a heavily researched inner city neighbourhood: Perspectives of people who use drugs on their experiences as peer researchers. *Social Science & Medicine*, 176, 85–92. <https://doi.org/10.1016/j.socscimed.2017.01.027>
- Denton, P., Madden, J., Roberts, M., & Rowe, P. (2008). Formative feedback: A comparative case study. *British Journal of Educational Technology*, 39(3), 470–484. <https://doi.org/10.1111/j.1467-8535.2007.00745.x>
- Gebhart, B., & Mollendorf, J. C. (1977). A new density relation for pure and saline water. *Deep Sea Research*, 24(9), 831–848.
- Greer, A., Amlani, A., Pauly, B., Burmeister, C., & Buxton, J. (2018). Participant, peer and peep: Considerations and strategies for involving people who have used illicit substances as assistants and advisors in research. *BMC Public Health*, 18(1), Article 835. <https://doi.org/10.1186/s12889-018-5765-2>
- Grossman, P., Dean, C., Kavanagh, S., & Herrmann, Z. (2019). Preparing teachers for project-based teaching. *Phi Delta Kappan*, 100(7), 43–48. <https://doi.org/10.1177/0031721719841338>
- Guerrero, M. C. M. de, & Villamil, O. S. (2000). Activating the ZPD: Mutual scaffolding in L2 peer revision. *Modern Language Journal*, 84(1), 51–68. <https://doi.org/10.1111/0026-7902.00052>
- Guo, S., & Yang, Y. (2012). Project-based learning: An effective approach to link teacher professional development and students learning. *Journal of Educational Technology Development and Exchange*, 5(2), 41–56. <https://doi.org/10.18785/jetde.0502.04>
- Hanjani, A. M., & Li, L. (2014). Exploring L2 writers' collaborative revision interactions and their writing performance. *System*, 44, 101–114. <https://doi.org/10.1016/j.system.2014.03.004>
- Hsiao, A., McSorley, G., & Taylor, D. (2019). Peer learning and leadership in engineering design and professional practice. In *Proceedings of the Canadian Engineering Education Association Conference*. <https://doi.org/10.24908/pceea.vi0.13465>
- Hwang, I., Wong, K., Lam, S. L., & Lam, P. (2015). Student response (clicker) systems: Preferences of biomedical physiology students in Asian classes. *Electronic Journal of E-Learning*, 13(5), 347–356. <http://www.ejel.org>
- Ikawati, L. (2020). Scaffolding in teaching writing. *Al-Tarbiyah: Jurnal Pendidikan (The Educational Journal)*, 30(1), 48–58. <https://doi.org/10.24235/ath.v30i1.6487>
- Jackson, B., Compton, J., Thornton, A., & Dimmock, J. (2017). Re-thinking anxiety: Using inoculation messages to reduce and reinterpret public speaking fears. *PLOS ONE*, 12(1), Article e0169972. <https://doi.org/10.1371/journal.pone.0169972>
- Jing, Y., Wang, C., Chen, Z., Shen, S., & Shadiev, R. (2024). A bibliometric analysis of studies on technology-supported learning environments: Hot

- topics and frontier evolution. *Journal of Computer Assisted Learning*, 40(3), 1185–1200. <https://doi.org/10.1111/jcal.12934>
- Kisaalita, W. S., Mativo, J. M., & Youngblood, K. M. (2022). What do reflective essays tell us about student learning outcomes from inquiry- and/or design-based international engagement projects? *Journal of Community Engagement and Scholarship*, 14(2), 1–13. <https://doi.org/10.54656/jces.v14i2.29> bcpublication.org+4jces.ua.edu+4people.coe.uga.edu+4
- Kitjaroonchai, N., & Phutiketkit, C. (2022). Online scaffolding strategies: Case studies of Asian EFL learners in an academic writing course. *Theory and Practice in Language Studies*, 12(10), 2036–2047. <https://doi.org/10.17507/tpls.1210.10>
- Lai, C. (2021). Effects of the group-regulation promotion approach on students' individual and collaborative learning performance, perceptions of regulation and regulation behaviours in project-based tasks. *British Journal of Educational Technology*, 52(6), 2278–2298. <https://doi.org/10.1111/bjet.13138>
- Längin, I. C., & Rostovtseva, M. V. (2015). Developing supportive learning environments. *Journal of Psychology Research*, 5(1), 1–7. <https://doi.org/10.17265/2159-5542/2015.01.004>
- Lengkoan, F., & Hampp, P. L. (2022). Imitation technique in learning English at English education department Universitas Negeri Manado. *Jurnal Pendidikan Bahasa Inggris Indonesia*, 10(2), 48–53. <http://ejournal-pbi.undiksha.ac.id/index.php/JPBI/article/view/2547>
- Lengkoan, F., Basri, M., Nur, S., Ali, N. N., & Maru, M. G. (2024). Higher education teachers' perception and use of project-based learning in teaching English. *Jurnal Lingua Idea*, 15(1), 1–15. <https://doi.org/10.20884/1.JLI.2024.15.1.9698>
- Lestari, N., Damayanti, R., Danim, S., & Yanti, F. (2023). Accounting teacher's perception of project-based learning. In *Proceedings of the 4th International Conference on Educational Development and Quality Assurance (ICED-QA 2021)* (pp. 426–441). Atlantis Press. https://doi.org/10.2991/978-2-38476-108-1_41
- Leth, S. A. (1976). *Interpersonal response: Confirmation, rejection, and disconfirmation in established friendships* [Unpublished doctoral dissertation]. Purdue University.
- Li, S., Gress, G., & Ziadé, P. (2019). Reflecting on the use of design methodology in engineering design education. In *Proceedings of the Canadian Engineering Education Association Conference*. <https://doi.org/10.24908/pceea.vi0.13711>
- Liando, N. V. F., Dallyono, R., Tatipang, D. P., & Lengkoan, F. (2023). Among English, Indonesian and local language: Translanguaging practices in an Indonesian EFL classroom. *Indonesian Journal of Applied Linguistics*, 13(1), 204–216. <https://doi.org/10.17509/ijal.v13i1.58270>
- Liando, N. V. F., Tatipang, D. P., & Lengkoan, F. (2022). A study of translanguaging practices in an EFL classroom in Indonesian context: A multilingual concept. *REiLA: Research and Innovation in Language Learning*, 5(2), 167–185. <https://doi.org/10.33603/rill.v5i2.6986>
- Mahmoud, M., Almutairi, Z., Mahmoud, A., Alanazi, H., Abdulrahman, S., & Abdulrahman, K. (2025). Comparison of medical students' peer evaluation and teaching staff evaluation of community health projects: Perceptions and experiences. *Advances in Medical Education and Practice*, 16, 99–108. <https://doi.org/10.2147/AMEP.S494025>
- Many, J. E., & Wiseman, D. L. (1992). The effect of teaching approach on third-grade students' response to literature. *Journal of Reading Behavior*, 24(3), 265–287. <https://doi.org/10.1080/10862969209547781>
- Markula, A., & Aksela, M. (2022). The key characteristics of project-based learning: How teachers implement projects in K-12 science education. *Disciplinary and Interdisciplinary Science Education Research*, 4(1), Article 2. <https://doi.org/10.1186/s43031-021-00042-x>
- Mdodana-Zide, L., & Mafugu, T. (2023). An interventive collaborative scaffolded approach with a writing center on ESL students' academic writing. *Journal of Culture and Values in Education*, 6(2), 34–50. <https://doi.org/10.46303/jcve.2023.7>
- Morales-Trujillo, M., Galster, M., Gilson, F., & Mathews, M. (2022). A three-year study on peer evaluation in a software engineering project course. *IEEE Transactions on Education*, 65(3), 409–418. <https://doi.org/10.1109/TE.2021.3123682>
- Nielsen, K. L., Hansen, G., & Stav, J. B. (2013). Teaching with student response systems (SRS): Teacher-centric aspects that can negatively affect students' experience of using SRS. *Research in Learning Technology*, 21, Article 19089. <https://doi.org/10.3402/rlt.v21i0.19089>
- Northrup, S., & Northrup, D. (2006). Multidisciplinary teamwork assessment: Individual contributions and interdisciplinary interaction. In *2006 IEEE Frontiers in Education Conference Proceedings* (pp. 1–6). IEEE. <https://doi.org/10.1109/FIE.2006.322591>
- Nourazar, S., Kakvand, R., & Aliasin, S. (2022). The impact of scaffolded metacognitive writing

- strategy instruction on Iranian intermediate EFL learners' IELTS writing task 2. *Education Research International*, 2022, 1–8. <https://doi.org/10.1155/2022/6297895>
- Park, S. H., & Denson, N. (2015). Students' response to academic setback: "Growth mindset" as a buffer against demotivation. *International Journal of Educational Psychology*, 4(2), 198–222. <https://doi.org/10.17583/ijep.2015.1482>
- Patton, M. Q. (2015). *Qualitative research & evaluation methods* (4th ed.). SAGE Publications.
- Peñaloza, A., & Salamanca, L. (2020). Writing from the self: Reflecting on the role of creative writing in the academic writing classroom. *Enletawa Journal*, 12(2), 97–121. <https://doi.org/10.19053/2011835x.10955>
- Pol, J. van de, Berg, B. A. M. van den, Admiraal, W. F., & Simons, P. R. J. (2008). The nature, reception, and use of online peer feedback in higher education. *Computers & Education*, 51(4), 1804–1817. <https://doi.org/10.1016/j.compedu.2008.06.001>
- Raimes, A. (1983). *Techniques in teaching writing*. Oxford University Press.
- Raška, D., Keller, E., & Shaw, D. (2013). Using web-based peer benchmarking to manage the client-based project. *Marketing Education Review*, 23(1), 23–30. <https://doi.org/10.2753/MER1052-8008230104>
- Rauschenbach, I., Keddis, R., & Davis, D. C. (2018). Poster development and presentation to improve scientific inquiry and broaden effective scientific communication skills. *Journal of Microbiology and Biology Education*, 19(1), Article 1511. <https://doi.org/10.1128/jmbe.v19i1.1511>
- Rindengan, M. (2019). Scaffolding model in learning of writing of essays, based on experience. In *Proceedings of the 5th International Conference on Education and Technology (ICET 2019)* (pp. 220–224). Atlantis Press.
- Roell, C. (2019). Using a case study in the EFL classroom. *English Teaching Forum*, 57(4), 24–33.
- Ruiz-Calleja, A., Bote-Lorenzo, M. L., Vega-Gorgojo, G., Serrano-Iglesias, S., Asensio-Pérez, J. I., Dimitriadis, Y., & Gómez-Sánchez, E. (2019). The potential of open data to automatically create learning resources for smart learning environments. In *Proceedings of the 8th International Conference on Smart Learning Environments* (p. 61). Springer. <https://doi.org/10.3390/proceedings2019031061>
- Santoso, J., & Nurkhin, A. (2022). Student digipreneur: The role of peer team-based learning and project-based learning. *Dinamika Pendidikan*, 17(2), 215–226. <https://doi.org/10.15294/dp.v17i2.39902>
- Saputri, D. Y., & Indriayu, M. (2018). Integrating game-based interactive media as instructional media: Students' response. *Journal of Education and Learning*, 12(4), 638–643. <https://doi.org/10.11591/edulearn.v12i4.8290>
- Setyowati, L., & Sukmawan, S. (2019). Authentic materials for teaching writing: A critical review. *Journal of English Educators Society*, 4(2), 68–77. <https://doi.org/10.21070/jees.v4i2.2129>
- Soled, D., Goel, S., Barry, D., Erfani, P., Joseph, N., Kochis, M., Uppal, N., Velasquez, D., Vora, K., & Scott, K. W. (2020). Medical student mobilization during a crisis: Lessons from a COVID-19 medical student response team. *Academic Medicine*, 95(9), 1384–1387. <https://doi.org/10.1097/ACM.000000000000340>
- Steenhuis, H. J., & Roland, L. (2018). *Project-based learning: How to approach, report, present, and learn from course-long projects*. Business Expert Press.
- Stenberg, M., Mangrio, E., Bengtsson, M., & Carlson, E. (2021). Formative peer assessment in higher healthcare education programmes: A scoping review. *BMJ Open*, 11(2), Article e045345. <https://doi.org/10.1136/bmjopen-2020-045345>
- Sukerti, G. N. A., & Yuliantini, N. (2018). Learning autonomy in writing class: Implementation of project-based learning in English for specific purposes. *Journal of Physics: Conference Series*, 953(1), Article 012101. <https://doi.org/10.1088/1742-6596/953/1/012101>
- Sung, Y.-T., Chang, K.-E., Chiou, S.-K., & Hou, H.-T. (2005). The design and application of a web-based self- and peer-assessment system. *Computers & Education*, 45(2), 187–202. <https://doi.org/10.1016/j.compedu.2004.07.002>
- Turan, Z., & Meral, E. (2018). Game-based versus to non-game-based: The impact of student response systems on students' achievements, engagements and test anxieties. *Informatics in Education*, 17(1), 105–116. <https://doi.org/10.15388/infedu.2018.07>
- Ugwu, C. (2017). Qualitative research. *IDOSR Journal of Science and Technology*, 3(1), 37–46. <http://www.idosr.org>
- Usmaldi, U. (2018). The effect of project-based learning and creativity on the students' competence at vocational high schools. In *Proceedings of the 5th UPI International Conference on Technical and Vocational*

Education and Training (ICTVET 2018) (pp. 14–17). Atlantis Press. <https://doi.org/10.2991/ictvet-18.2019.4>

Yin, R. K. (2018). *Case study research and applications: Design and methods* (6th ed.). SAGE Publications.

Zuhra, C., Muslem, A., & Daud, B. (2022). The effectiveness of reciprocal scaffolding technique on students' writing skill. *English Education Journal*, 13(1), 92–105. <https://doi.org/10.24815/eej.v13i1.24549>