



Interactive dynamic literacy in the EFL classroom: Students' perceptions of a problem-based writing approach using a graphic organizer

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ABSTRACT

Article History

Received: 9 January 2026

Revised: 13 April 2026

Accepted: 24 July 2026

Published: 17 August 2026

Keywords

Interactive dynamic literacy model

Problem-based learning

Student perception

Writing development

Graphic organizer.

Developing effective writing proficiency continues to pose significant difficulties for EFL learners, often stemming from limited engagement, inadequate scaffolding, and traditional teacher-centered approaches. Thus, this present mixed-methods study explores how students perceive the restructured Interactive Dynamic Literacy Model (IDLM)-driven Problem-Based Learning (PBL) framework, scaffolded by graphic organizers, to cultivate interactive literacy and advance students' writing development. Using a mixed-methods approach, data were systematically gathered over a four-week implementation involving 25 university EFL students through a validated Likert-scale questionnaire and semi-structured interviews. The quantitative findings showed generally favorable perceptions of the instructional model (overall $M = 3.36$), especially regarding the learning syntax, reaction principles, and the instructional impact. The scale's reliability coefficient (Cronbach's $\alpha = 0.625$) falls within an acceptable range for instruments used in exploratory measures capturing multiple perception constructs. The thematic analysis of interview data further illuminated how the redesigned instructional model facilitated learning, supported students' cognitive engagement, idea generation, collaborative inquiry, and constructive use of feedback. Even so, the analysis also revealed persistent challenges, including group dynamics, inconsistent use of assessment tools, and limitations in the instructor's ability to provide equitable real-time guidance. Integrating both data strands, the study demonstrates that the IDLM-based PBL framework with graphic organizer support fosters a supportive, engaging, and socially interactive environment that promotes writing development, while also revealing the need for differentiated scaffolding and adaptive instructional practices to address diverse learner needs. Implications for writing pedagogy, curriculum development, and avenues for further inquiry.

Contribution/Originality: This study contributes to EFL writing research by reconceptualizing Problem-Based Learning (PBL) through the operationalization of the Interactive Dynamic Literacy Model (IDLM) into a structured framework that integrates graphic organizers, reading-to-write pedagogy, and rubric-guided self-regulation. The authors confirm that this work is original and has not been published previously, nor is it currently under consideration for publication elsewhere. They have read and approved the final manuscript and agree to its submission to this journal.

1. INTRODUCTION

Developing effective writing skills remains one of the most enduring challenges for English as a Foreign Language (EFL) learners. Despite curricula having undergone repeated revisions and new pedagogical strategies and

learning materials being introduced, students often struggle with generating ideas, structuring arguments, maintaining coherence, and demonstrating critical thinking in their writing. This continued challenge signals that current reforms may not adequately support learners in meeting the higher-order demands of writing. Acknowledging that writing is a complex activity that draws heavily on cognitive resources (Teng, 2022; Westwood, 2004; Williams, 2005) traditional writing instruction rooted in teacher-centered practices that rely on passive reception and repetitive drills on vocabulary, sentence patterns, and the use of conjunctive devices, often fails to foster students' meaningful engagement with the writing process (Abas & Abd Aziz, 2018). Consequently, students regard writing as an overwhelming and burdensome task (Ai, 2015), resulting in slow development of their writing competence, evidenced by limited creativity, poorly constructed arguments, and insufficient autonomy in managing the writing process. This enduring dilemma has prompted educators to search for effective, student-centered strategies that facilitate active learning and foster greater learner agency and engagement in developing students' writing proficiency (Chang, Li, Huang, & Whitfield, 2021).

Taking into account the varied functions of writing, which extend beyond linguistic expression to encompass cognitive and social practices (Anderson, Chaparro, Smolkowski, & Cameron, 2023; Durrant, 2025), requiring interaction, problem-solving, and reflection, the adoption of effective strategies that strengthen learners' reflective capacities, such as Problem-Based Learning (PBL), is indispensable to meaningful writing development. In recent years, PBL has gained substantial attention as a pedagogical framework capable of elevating the quality of learning by cultivating students' reflective, critical thinking, collaborative skills, and problem-solving in authentic learning situations (Yew & Goh, 2016). By engaging persistently with real-world tasks, students not only develop subject-specific knowledge and skills but also acquire a broader set of competencies, including effective communication, teamwork, and the ability to analyze and synthesize complex challenges (Benítez-Chavira, Zárate-Grajales, & Moreno-Monsiváis, 2026). Given that writing tasks are socially situated, multilayered forms of problem-solving that involve identifying issues, exploring possible solutions, and articulating well-reasoned arguments (Sala-Bubaré & Castelló, 2023), PBL offers a promising avenue for transforming the writing classroom into an interactive space aligned with real-world literacy practices.

With respect to its pedagogical potential, a substantial body of scholarship has explored the use of PBL across diverse contexts of EFL instruction. As evidenced by research, PBL helps improve students' engagement and comprehension abilities (Berenji, Saeidi, & Ghafoori, 2020), language achievement (Orhan, 2025), problem-solving skills, academic skills, and social skills (Kök & Duman, 2023), and promotes critical thinking skills and dispositions in the EFL classroom (Orhan, 2024). Studies specifically linking PBL to writing have reported notable improvements in writing quality, including enhanced paragraph organization and grammatical accuracy (Alghamdy, 2023), and likewise indicate that PBL elevates students' writing performance and creative thinking (Helaluddin, Mannahali, Purwati, Alamsyah, & Wijaya, 2023). Despite substantial evidence, the existing literature remains heavily outcome-oriented (Koçoğlu & Kanadlı, 2025). Most prior studies focus on quantifiable performance outcomes, such as test scores, writing accuracy, and creativity (e.g., Almziad, 2024; Jumariati & Arapah, 2024), whereas they provide limited evidence of students' internal learning processes, and how students experience and perceive interaction, collaboration, reflection, and cognitive engagement within PBL contexts remains underexplored. This gap signals the need to explore learners' perceptions of how PBL cultivates interactive, dynamic literacy and shapes the dynamics of their writing processes, rather than limiting attention to the final written product. Furthermore, although several studies have recognized the significance of PBL in fostering collaboration and communication (Ayubi, Arthamena, Ikhsan, Rosa, & Ash-Shiddiqi, 2025; Ningsih et al., 2025), limited attention has been given to mapping these interactions into a structured instructional model with explicit learning syntax, reaction principles, and instructional impact. This gap is particularly evident in EFL writing pedagogy, where the Interactive Dynamic Literacy Model (IDLM) remains underutilized as a conceptual framework for redesigning PBL-based writing instruction. Within the IDLM, the redesigned instructional model positions the graphic organizer as a pedagogical tool to mediate students' thinking

processes throughout problem-based writing activities. As a form of cognitive scaffolding, graphic organizers assist learners in generating ideas, organizing arguments, visualizing relationships among concepts, and progressively constructing well-organized written texts through interactive engagement and instructional guidance (Marashi & Massoodi-Hematabadi, 2011; Maslichah & Tarwiyah, 2017; Styati & Irawati, 2020). This strategic integration constitutes a core pedagogical innovation in operationalizing the IDLM by adopting a graphic organizer for redesigning the PBL framework in EFL writing contexts.

To address this gap, the present study aims to explore students' perceptions of Interactive Dynamic Literacy fostered through a modified Problem-Based Writing approach using a graphic organizer in the EFL classroom. The redesigned PBL model, with a newly formulated syntactic structure used in this research, has been implemented in writing instructions. Drawing on a mixed-methods design employing questionnaires and interviews, the current study seeks to uncover how students perceive their learning experiences within a modified Problem-Based Learning model integrated with an interactive, dynamic literacy framework. This entails the dimensions of learning syntax, reflected in the sequence of instructional stages; the reaction principles, such as teacher and peer responses and feedback; and the instructional impact, as perceived in their writing development and learner autonomy. The study also explores the perceived pedagogical benefits and instructional challenges of the modified PBL model in EFL writing classrooms, particularly in relation to its contributions, such as idea generation, argument development, and sustained engagement.

By foregrounding learners' lived experiences, the study sheds light on how redesigned PBL nurtures literacy as a social, participatory, and cognitively rich activity. Building on this insight, the study contributes to existing scholarship by providing empirical evidence on how interactive, dynamic literacy emerges and is experienced by learners within a PBL-oriented writing setting. This contribution enriches theoretical understandings of PBL by revealing that writing development is driven not solely by students' engagement with problem scenarios but also by the quality of interactions students cultivate with peers, texts, and instructional prompts. From a practical standpoint, the findings offer pedagogical implications for designing writing instruction that promotes meaningful participation, learner agency, and reflective practice, including the use of graphic organizers adapted to a problem-based learning environment.

2. METHOD

A mixed-methods explanatory design was employed to explore how EFL students perceived the designed PBL model enriched with IDLM through graphic designers. This adapted PBL framework was applied in the writing course to assess its perceived effectiveness and learning impact. The explanatory design was deemed appropriate as it allowed the study to assess both the quantitative patterns in students' perceptions of the pedagogical instruction and the qualitative depth of their lived experiences with its interactive and literacy-oriented features. Mixed-methods designs provide a robust methodological framework for synthesizing quantitative trends with qualitative insights, thereby offering richer and more contextually situated interpretations of complex pedagogical interventions (Creswell & Clark, 2018). In this design, the quantitative stage generates an initial empirical overview of students' responses, which is then clarified and elaborated through the qualitative phase. Therefore, the integration of both data sets enhanced the robustness of the analysis, offering more comprehensive insights into how the IDLM-driven PBL model, which incorporated graphic organizers, supported students' interactive literacy development (Teddle & Tashakkori, 2009). The study involved 25 undergraduate EFL students enrolled in the English Education Program at Asahan University, Indonesia. Participants were chosen since the university offers a compulsory writing course designed to develop students' writing skills. In practice, however, students encounter challenges that hinder their progress, highlighting the need for a redesigned instructional model relevant and effective in addressing these obstacles. To ensure that all participants had firsthand experience with the redesigned teaching model, they were recruited through purposive sampling following a four-week implementation of the IDLM-based instructional

framework. This sampling strategy aligned with the mixed-methods design, as it enabled the collection of both quantitative outcomes and in-depth qualitative perspectives obtained from information-rich cases (Patton, 2002). Participants' firsthand engagement with the modified PBL framework strengthens valid and credible evidence, including learning syntax, reaction principles, and pedagogical impact (Creswell & Poth, 2018). All participants had completed prerequisite writing courses, which equipped them with the necessary writing competence and ensured their readiness to engage with the IDLM-oriented PBL instructional framework with graphic organizer support. The sample also displayed demographic diversity, encompassing varied genders, ages between 19 and 21, and proficiency levels that ensured the heterogeneity of perspectives on interactive literacy practices and PBL-oriented writing activities. All participants took part voluntarily and were informed of confidentiality procedures as well as their right to withdraw participation without penalty, consistent with recognized ethical research practices (McMillan & Schumacher, 2014). Data were collected using two primary instruments: a structured perception questionnaire and a semi-structured interview. The use of complementary instruments supports methodological triangulation and reinforces the validity of the findings (Creswell & Clark, 2018). The perception questionnaire employed a four-point Likert scale ranging from 1 (bad) to 4 (very good) and measured students' perceptions across three principal components of the redesigned instructional model: learning syntax, reaction principles, and instructional impact. Item validity was assessed using item-total correlation analysis. The internal consistency of the instrument yielded a Cronbach's alpha coefficient within the range of 0.60–0.69, indicating a level of internal consistency that, while below confirmatory standards, is acceptable for exploratory research purposes (Cronbach, 1951; Nunnally & Bernstein, 1994). The essential components assessed were in accordance with the IDLM framework and the core features of PBL utilizing graphic organizers. To ensure measurement quality, the questionnaire underwent expert validation and was piloted to ensure clarity, reliability, and construct alignment (Dörnyei & Dewaele, 2023). To deepen the inquiry, semi-structured interviews were administered using a ten-item open-ended question to probe students' interactive literacy experiences within the IDLM-based PBL environment scaffolded through graphic organizers. Aligned with qualitative interviewing principles, the semi-structured format provided a guided conversational structure while allowing students to elaborate on salient experiences, including collaborative inquiry, engagement with problem scenarios, and perceived improvements in their writing skills. Data collection was unfolded in two sequential phases. In the initial phase, the perception questionnaire was administered to all 25 participants immediately following the four-week IDLM-based PBL intervention supported by graphic organizers. Administering the instrument at this point ensured that participants' responses were directly informed by, and reflective of, their authentic learning experiences throughout the learning process. In the second stage, five students were selected using maximum variation sampling for semi-structured individual interviews. Each interview, lasting approximately 20-30 minutes, was audio-recorded with participants' consent, transcribed verbatim, and subsequently translated into English. All transcription and translation procedures adhered to professional protocols to maintain the fidelity, detail, and accuracy of the original responses.

Following the sequences of the explanatory mixed-methods design, the analysis commenced with the quantitative data. Descriptive statistics, including means, standard deviations, and response distributions, were used to measure students' perceptions of the PBL model enacted through IDLM with graphic organizer mediation. Meanwhile, to determine the reliability of the instrument, Cronbach's alpha was examined in accordance with established psychometric criteria (DeVellis, 2017). For the qualitative phase, interview transcripts were analysed using thematic analysis following (Braun & Clarke, 2006) six systematic steps: familiarizing with the dataset, generating initial codes, identifying preliminary or potential themes, refining and reviewing themes, defining and naming themes, and composing a coherent analytic narrative. Manual coding was conducted to preserve analytical depth and proximity to the data. To ensure the credibility and trustworthiness of the findings, the study employed triangulation and member checking. Ultimately, the quantitative and qualitative results were integrated to generate

a comprehensive explanatory interpretation of students' perceptions of the IDLM-based PBL model integrated with graphic organizers.

3. RESULTS

This section presents the analysis of descriptive questionnaire findings and qualitative evidence from interview data. These combined results reveal convergences between statistical trends and students' narrative accounts of their experiences with IDLM-framed PBL pedagogy mediated through graphic organizers. As indicated by the quantitative data, students held generally positive perceptions of the IDLM-based PBL model scaffolded by graphic organizers, with Table 1 showing an overall mean score of 3.36 (SD = 0.45) on a four-point Likert scale, indicating favorable attitudes toward the instructional intervention. However, the item-level means ranged from 2.96 to 3.96, indicating differential perceptions across the components of the models and highlighting certain aspects where the instructional design resonated more strongly with students.

Table 1. Descriptive Statistics of Questionnaire Items.

Item	Mean	SD	Min	Max
Q1	3.56	0.51	3	4
Q2	3.64	0.64	2	4
Q3	3.60	0.50	3	4
Q4	3.16	0.55	2	4
Q5	3.32	0.56	2	4
Q6	3.20	0.58	2	4
Q7	3.20	0.58	2	4
Q8	3.04	0.20	3	4
Q9	2.96	0.20	2	3
Q10	3.96	0.20	3	4
Overall	3.36	0.45	2	4

The item-level statistics above reveal three distinct clusters of student perceptions. Item 10 was rated most favorably among all items ($M = 3.96$, $SD = 0.20$), with 96% of students rating it as “very good,” reflecting near-unanimous approval. Items 1, 2, and 3 also garnered robust positive perceptions, each exceeding a mean score of 3.50. By contrast, Items 8 and 9 received the lowest evaluations ($M = 3.04$ and 2.96 , respectively), though their standard deviations ($SD = 0.20$) indicate a high degree of agreement despite the comparatively lower ratings. The remaining items 4 through 7 fell into a mid-range category, with mean values between 3.16 and 3.32 and moderate standard deviations (0.55–0.58), thus exhibiting more varied responses and potentially differing student experiences with aspects of the instructional model. In addition to the descriptive statistics of the questionnaire items, the analysis of response distributions provides insight into how participants utilized the rating scale and uncovers possible measurement problems not evident from mean scores and standard deviations.

Table 2. Frequency distribution of responses.

Item	Response							
	1		2		3		4	
	N	%	N	%	N	%	N	%
Q1	0	0%	0	0%	11	44%	14	56%
Q2	0	0%	2	8%	7	28%	16	64%
Q3	0	0%	0	0%	10	40%	15	60%
Q4	0	0%	2	8%	18	72%	5	20%
Q5	0	0%	2	8%	14	56%	9	36%
Q6	0	0%	3	12%	16	64%	6	24%
Q7	0	0%	4	16%	14	56%	7	28%
Q8	0	0%	0	0%	24	96%	1	4%
Q9	0	0%	2	8%	23	92%	0	0%
Q10	0	0%	0	0%	1	4%	24	96%

Table 2 presents the distribution of responses across all questionnaire items, revealing a consistently positive pattern characterized by a strong clustering toward the upper end of the 4-point scale. Notably, none of the participants opted for the lowest category (1), indicating that there were no negative evaluations throughout the instrument. For Items Q1 through Q7, responses cluster predominantly in categories 3 and 4, albeit with differing proportions. Items Q1 (44% in category 3; 56% in category 4), Q2 (28%; 64%), and Q3 (40%; 60%) all exhibit strong levels of agreement, with the majority of participants selecting the highest rating. While Items Q5 to Q7 display more modest endorsement of the highest category, their distributions remain strongly skewed toward positive responses. For instance, Q7 received 16% in category 2, 56% in category 3, and 28% in category 4. Moreover, Items Q4, Q6, and Q7 reveal dominant clustering in category 3, with 72%, 64%, and 56% of responses, respectively. These items, although still positively skewed, present comparatively lower proportions in category 4, implying slightly more varied perceptions or more moderate levels of endorsement. A more pronounced skew appears for Items Q8, Q9, and Q10, which show extreme clustering at the high end of the scale. Q8 displays 96% of responses in category 3 and only 4% in category 4, while Q9 has 92% exclusively in category 3. Furthermore, Q10 exhibits the strongest endorsement across the entire instrument, with 96% of respondents selecting the maximum category (4) and only one respondent selecting category 3. These distributions indicate strong agreement and minimal variability. Overall, the response distribution reveals consistently favorable perceptions, marked by pronounced positive skewness and low dispersion across items. Such trends imply that respondents generally endorse the constructs being measured.

Regarding the validity assessment, internal consistency was measured with Cronbach's alpha, yielding a coefficient of $\alpha = 0.625$. Although marginally under the preferred threshold, reliability coefficients ranging from 0.60 to 0.70 are regarded as adequate or acceptable for scales designed to capture multidimensional constructs within exploratory research contexts (DeVellis, 2017; Hair, Black, Babin, & Anderson, 2010). The moderate alpha suggests that the items, while largely coherent constructs associated with students' perceptions of the PBL model grounded in IDLM with graphic organizer support, exhibit some differences. Such variation is likely attributable to the nature of the instructional framework, consisting of elements of learning syntax, principles of learner response, and broader instructional effects.

Table 3. Variance components and reliability calculation.

Item	Item Variance (σ^2_i)	Item Mean
Q1	0.257	3.56
Q2	0.407	3.64
Q3	0.250	3.60
Q4	0.307	3.16
Q5	0.310	3.32
Q6	0.333	3.20
Q7	0.333	3.20
Q8	0.040	3.04
Q9	0.040	2.96
Q10	0.040	3.96
Sum of item variances ($\sum \sigma^2_i$)	2.317	
Total score variance (σ^2_t)	5.307	

Note: Cronbach's $\alpha = 0.625$.

Table 3 presents the variance components and reliability calculation, highlighting notable patterns in item-level variance. Items 8, 9, and 10 demonstrated markedly restricted variance ($\sigma^2 = 0.040$), contributing minimally to the overall variability of the scale scores. This restriction emerged from the clustering of responses, with items 8 and 9 receiving mostly ratings of 3, and item 10 receiving predominantly ratings of 4. Conversely, Items 1-7 exhibited higher variability ($\sigma^2 = 0.250$ – 0.407), indicating more diverse student perceptions across the aspects of the model. Such variance patterns suggest that the questionnaire captures both areas of strong consensus (items 8-10) and

components eliciting more varied responses (items 1-7), resulting in a more nuanced measurement framework rather than a strictly unidimensional construct. The data underscores the generally positive perceptions of the redesigned PBL framework anchored in IDLM with graphic organizer support, while also revealing varying levels of measurement across its elements. This indicates that although students hold favorable views overall, their responses differ meaningfully among the components of the pedagogical model.

While the quantitative patterns establish the general direction of students' perceptions, the qualitative evaluation illuminates the underlying experiences that give meaning to these accounts. Building on these trends, students' responses corroborate the descriptive statistical findings, collectively indicating positive perceptions of the designed pedagogical intervention across dimensions related to learning syntax, reaction principles, and instructional impact. The ratings for Items 1-3 ($M = 3.56-3.64$) suggest that students' experiences with the design features of the instructional framework are strongly positive. In contrast, the comparatively lower ratings for items 8 and 9 ($M = 2.96-3.04$) point to more nuanced perceptions regarding the availability of instructor support. Such perceptions highlight the instructor's ability to design and facilitate a structured learning environment as the critical factor contributing to the students' positive learning experiences. Moreover, the high rating for item 10 ($M = 3.96$, $SD = 0.20$), with 96% of respondents selecting "very good," aligns with qualitative evidence that confirms the students' perceived gains in meaningful learning outcomes and skill development.

4. DISCUSSION

Drawing on the investigation from both data facets, this segment interprets the findings through three main aspects: learning syntax, reaction principles, and instructional impact.

4.1. Learning Syntax

In light of learning syntax, the initial phase of problem orientation, depicted in the high mean score for Item 1, was highly motivating and engaging, aligning closely with students' learning expectations. A student uttered,

"My lecturer's instruction to rewrite a narrative text related to the folklore of Asahan Regency, where I reside, initially sparked my interest and motivated me to study. It made me curious to learn more about the story." (S1).

By incorporating culturally responsive elements, the task design succeeded in attracting not only students' attention but also in establishing a sense of personal relevance, an essential driver of maintaining sustained engagement throughout the learning process (Haniko, Mubarak, Syamsurijal, Pasaribu, & Ichsan, 2024; Masita, Hidayat, & Fortunasari, 2025). This is consistent with the perspective of Anyichie, Butler, and Nashon (2023), which advocates the significance of incorporating students' cultural elements into classroom learning, as it allows students to move beyond surface understanding of the learning material by linking it to social realities and the values within their environment (Bahri, Sutikno, Arifin, & Widodo, 2025). Put simply, when language instruction is divorced from the learners' local environment, it renders the instructional process unengaging, irrelevant, and lacking contextual resonance (Khan, 2014). This substantiates that the effectiveness of organizational scaffolds emerged as a prominent subtheme, which explains the consistently high scores for Items 2 and 3. Student 3 reported that comprehending the organization of the text contributed substantially to the ease of generating ideas:

"After understanding the narrative text, I now have many ideas to rewrite my story. I get an idea in terms of the participants involved in the story, the complications, and the solution as well. In addition, a graphic organizer helps me in organizing the ideas." (S3)

The above remark highlights the effectiveness of the IDLM-based approach mediated by graphic organizers in enhancing students' cognitive engagement through explicit instructional modelling and visual aids, which allowed them to analyse and reorganize narrative components in a structured manner (Bogaerds-Hazenbergh, Evers-Vermeul, & van den Bergh, 2021). More importantly, the cognitive processes involved in generating and organizing the narrative texts become more manageable with the support of graphic organizers, as these tools help students

categorize and structure their ideas by decomposing complex concepts into manageable elements. The instructional value of graphic organizers is further reinforced by another participant's reflection, who stated.

"The graphic organizer helps me arrange the story from beginning to end by giving me a structured way to organize the sequence of events and ensure that each part of the narrative connects smoothly." (S4)

This firsthand account corroborates (Al-Shidi, 2024) findings that graphic organizers effectively stimulate students' cognitive processes, prompting them to analyze and synthesize information more appropriately. Furthermore, Chigbu et al. (2023) maintain that graphic organizers enable students to think out ideas about the essay topic and to clearly organize both main and supporting ideas.

Beyond this, the incorporation of writing rubrics as self-assessment tools substantially enhanced students' metacognitive awareness and autonomy in writing. Student 2 illustrated this process:

"I could review the content and the organization of the text by using the writing rubric. I could assess the draft by myself to see the progress of the writing before being corrected by my lecturer." (S2).

Students exhibited a metacognitive approach to their learning; thus, they recognized both their strengths and areas for improvement. This suggests that the writing rubric functioned not only as an evaluative instrument but also as scaffolding for self-regulated learning, helping students internalize assessment criteria and track their own progress independently. This statement resonates with the quantitative evidence of students' favorable views of assessment practices and supports the inference that clearly articulated criteria allowed students to track and regulate their writing development. Alimardonova (2024) contends that rubrics help learners internalize standards for quality writing and promote self-reflection and active revision. Furthermore, self-assessment is instrumental in developing metacognitive regulation and writing autonomy (Ratminingsih, Marhaeni, & Vigayanti, 2018; Widiartini & Sukerti, 2023). Therefore, providing students with a rubric of guiding questions is essential for supporting their metacognitive decision-making to select the most effective writing strategies based on the audience and purpose (Graham et al., 2016). Additionally, the instructor's guided attention to linguistic accuracy was appreciated, with Student 2 noting:

"I was guided by the lecturer in assuring the grammar, vocabulary, spelling, punctuation, and capitalization." (S2).

It reflects that, in addition to explicit instruction and rubrics, instructor guidance addressing linguistic accuracy is crucial for scaffolding students' writing development. This suggests that targeted feedback on language mechanics helped students consolidate foundational skills, reinforcing their confidence and competence in producing polished written texts (Fitriyah, Ningrum, & Gozali, 2024; Solfiyatuazzahro, Santihastuti, & Erfan, 2019; Yunus, 2020). In combination with self-assessment practices, such guidance contributed to a more balanced development of both meaning and accuracy in writing.

What's more, the data reveal a moderate degree of variability in Items 4 to 7 ($M = 3.16-3.32$, $SD = 0.55-0.58$), which points to implementation issues that emerged during collaborative activities. Student 4 reflected group dynamics as a source of tension:

"Different ideas in organizing ideas in the graphic organizer caused debate." (S4)

The statement suggests that collaborative discussion impacts learning in two ways. While it encourages debate and deepens cognitive engagement by exposing students to diverse perspectives, it can also cause discomfort for those less experienced in handling differing viewpoints. It indicates that collaborative tasks promote critical thinking (Gokhale, 1995) but may also affect students' confidence and participation variability. Additionally, Student 5 admitted to inconsistent use of assessment tools.

"I never use the rubric, so I found trouble assessing the draft." (S5)

This admission draws a crucial disconnect between scaffold availability and actual utilization, suggesting that rubrics and self-assessment tools require clear introduction and rehearsal to be effective (Panadero, Jonsson, Pinedo, & Fernández-Castilla, 2023). Despite these challenges, the collaborative dimension of the problem-based learning design was still viewed positively. Student 1 observed.

"In group, I could discuss with my friends to answer the question. I could also discuss with the lecturer when I got trouble and difficulty." (S1)

It confirmed the pivotal role of peer and instructor support in the learning setting. Peer collaboration provided opportunities to share ideas and jointly construct knowledge, while lecturer support offered timely guidance and clarification in response to challenges.

4.2. Reaction Principles

When it comes to reaction principles, the findings highlight how important it was for students to feel supported and guided throughout the learning process. The instructor's support significantly shaped how students experienced and engaged with the learning environment. As student 5 remarked,

"The lecturer's presence in the classroom made me easily run the learning process. The lecturer had prepared materials for us to learn from. I could easily get comprehension because the lecturer explained the difficulty." (S5).

Similarly, student 3 underscored the value of instructor guidance during the most demanding stage of the task.

"The lecturer guides me when I have difficulty, especially during the process of rewriting the narrative text." (3).

Both standpoints illustrate the significance of instructor-provided scaffolding and well-designed learning materials. Even in learner-centered or self-directed activities, students find that the lecturer's active guidance helps them understand challenging materials. This affirms that successful learning environments combine learner autonomy with instructor support, ensuring students can confidently and effectively navigate complex tasks. Shehzad and Charles (2023) underscore that the success of student-centered approaches depends largely on the instructor's active role in mediating learners' cognitive entry into tasks. This illustrates that carefully timed instructional scaffolding was not supplementary but instrumental in enabling learners to manage the complexity of text reconstruction. Additionally, Student 1 described the educational benefit of the lecturer's role in managing group discussion.

"The lecturer controlled the discussion during the presentation by guiding the flow of ideas and ensuring that every group stayed focused on the main topic. Whenever the discussion started to move off-track or became unclear, the lecturer intervened with clarifying questions and helpful prompts." (S1).

The concept of instructional discourse, in which educators guide collaborative dialogue, helps students stay focused and scaffold understanding while remaining in control of the learning process. Such practices align with research highlighting that effective facilitation entails providing subtle prompts and clarifications that foster learning experiences without overriding student participation (Aktepe & Coskun, 2014; Muir, Douglas, & Trimble, 2020).

Although students acknowledged the benefits of the intervention, the moderate ratings for items related to instructor support reveal an operational constraint: the difficulty of providing timely, individualized assistance within a whole-class PBL setting. Student 4 expressed this concern explicitly:

"The lecturer's limited attention toward the students affects the learning process because not all of us receive equal guidance. I need clarification or support, but I have to wait longer, or sometimes I do not get the help during the activity." (S4).

A well-documented tension in PBL classrooms involves heightened learner autonomy accompanied by increased demand for timely scaffolding that often exceeds available instructional resources. The consistently "good" rather than "very good" ratings, coupled with low standard deviations, further indicate that this challenge was experienced across the cohort rather than by isolated individuals. This systemic challenge reflects conditions such as high student load and limited instructional time, rather than deficits in instructional design or teacher proficiency. Despite these concerns related to instructional accessibility, students consistently valued the systematic and transparent nature of the assessment process. As Student 2 noted,

"The lecturer assessed my writing by using a writing rubric, which made the evaluation process more transparent and systematic. Through the rubric, I could clearly see the specific aspects of my narrative that needed improvement, such as content, organization, grammar, vocabulary, and mechanics." (S2).

This validates the value of criterion-referenced assessment, demonstrating that well-designed rubrics not only make evaluation transparent and systematic but also foster student metacognition. Through structured rubrics, learners can identify areas for improvement and engage in productive revisions independently; hence, such tools support students in taking ownership of their learning, reducing reliance on teacher feedback, and promoting iterative refinement and mastery of writing skills. Olson and Krysiak (2021) argue that rubrics not only provide consistent and transparent evaluation of students' work but also serve as a valuable scaffold for learning. Meanwhile, Allen and Tanner (2006) contend that rubrics can be designed to establish standards for levels of achievement and guide performance improvement, making these standards clear and explicit to students. Therefore, rubrics not only enhance teaching and support sound assessment practices but also serve as a valuable source of information for improving learning, especially within this study's context aimed at enhancing students' writing (Wolf & Stevens, 2007).

4.3. Instructional Impact

Regarding instructional impact, students confessed to meaningful gains in both learning and skill development. The reading-to-writing approach, a central component of the IDLM framework, effectively supported students in generating ideas and producing coherent written texts (Eldouma & Elamin, 2018). As student 3 reflected:

"By reading the text first before writing, it helped me obtain ideas that were easier to rewrite. Despite many corrections, I was able to rewrite the text according to the rubric." (S3).

It conveys the combined influence of textual modeling and iterative revision on the development of writing skills. Initial engagement with the model text served as a cognitive scaffold, enabling the student to generate and organize ideas. When coupled with repeated revisions guided by rubric criteria, the learning process demonstrated the student's resilience and commitment to improvement. The reflection underscores how preparatory exposure to model texts, when combined with structured feedback, fosters both thinking and mastery of writing standards. Student 1 provided a more nuanced description of reading as a cognitive apprenticeship process, noting:

"Reading the text before starting my writing helped me generate clearer ideas that could be rewritten more easily. The reading provided me with a model of how the narrative was structured, which guided me in organizing my own version." (S1).

Such exposure to exemplar texts allowed students to assimilate narrative structures and features, subsequently transferring these patterns into their own writing. This alignment between reading and writing tasks exemplifies an effective integration of receptive and productive skills, a core principle of the IDLM (Kim, 2020). Additionally, the role of feedback and revision in fostering learning was particularly salient in students' reflections. Student 4, for example, demonstrated this through evident metacognitive development in response to corrective feedback.

Although I received many corrections during the revision process, these comments helped me understand the weaknesses in my draft. With the lecturer's feedback and the criteria in the rubric, I was eventually able to rewrite the text more accurately and in accordance with the expected standards." (S4)

The transition from perceiving corrections as evaluative judgments to recognizing them as constructive, formative guidance reflects the development of a growth-oriented stance toward writing. The student's ability to integrate feedback from both the instructor comments and the rubric, and to apply it effectively in revising the text, illustrates advanced self-regulatory processes and adaptive learning competence (Leahy, Lyon, Thompson, & Wiliam, 2005).

Nonetheless, the qualitative data revealed notable individual differences in how students responded to the instructional model. Student 2's experience, in particular, demonstrated that the intervention was not uniformly effective for all learners.

"I still struggle to develop and organize my ideas despite receiving many corrections." (S2)

This points out that, despite intensive feedback, some learners continue to struggle with generating and organizing ideas. Such persistent difficulties suggest that standard interventions, though effective for many, may not

suffice for all students. To address these differences, additional or alternative scaffolding strategies such as model-based instruction, structured brainstorming exercises, or individualized guidance may be necessary to support their cognitive and organizational development. In other words, adaptive teaching and differentiated support are critical in meeting the diverse needs of learners (Arora, 2025; Goyibova, Muslimov, Sabirova, Kadirova, & Samatova, 2025). The varying learning trajectories mirror the moderate dispersion noted in the mid-range questionnaire items and highlight the imperative for differentiated instructional strategies within PBL frameworks to effectively address diverse learner needs and levels of readiness (Ab Hajis & Othman, 2024; Goyibova et al., 2025).

Thus, the findings suggest that when its essential components are deliberately enacted, the IDLM-based PBL framework enriched with graphic organizers can foster highly supportive learning conditions conducive to strengthening students' writing competence. These findings carry several important implications for instructional practice and future research. To begin with, the effectiveness of culturally relevant, locally grounded writing tasks suggests that EFL curricula should intentionally integrate learners' linguistic and cultural backgrounds to enhance engagement. This is in line with Panjaitan, Firmansyah, Sapta, Aprilia, and Siregar (2025) who contend that embedding local cultural values in instructional tools can enhance students' comprehension and promote greater interest and engagement in learning. Moreover, the value students place on graphic organizers and writing rubrics indicates that explicit instruction in metacognitive and self-regulatory strategies should be embedded within PBL-based writing instruction. Another implication arising from the findings is that individual differences in how students respond to feedback highlight the need for adaptive instruction that acknowledges learners' diverse needs and delivers tailored instructional support. While this study offers valuable insights, it is not without limitations that warrant consideration in future research. The relatively small sample of EFL college students limits the generalizability of the findings. Besides, the brief duration of the intervention constrained the assessment of long-term effects and retention. Considering these limitations, further inquiry is needed to clarify how culturally relevant tasks contribute to improved writing outcomes, to identify scalable approaches for ensuring equitable support in large and more diverse PBL settings. Moreover, longitudinal studies that track the long-term effects of IDLM-based PBL facilitated with graphic organizers on writing development would further reinforce the empirical foundations of this pedagogical model. In addition, studies on digital or technology-integrated adaptation of the model may yield strategies for mitigating the instructor-accessibility issues observed in this study, potentially enabling larger-scale implementations of PBL while preserving the quality of student support.

5. CONCLUSION

Findings from this mixed-methods analysis demonstrate that EFL students perceived the IDLM-based PBL model with graphic organizer scaffolding highly favorably, with particularly strong appreciation for its learning outcomes, culturally relevant tasks, and reading-to-write instructional design. Quantitative results revealed consistent perception trends across components ($M = 3.36$, range = 2.96-3.96) and indicated acceptable reliability ($\alpha = 0.625$). Complementing these patterns, the qualitative analysis illuminated the instructional characteristics and implementation factors that shaped students' perspectives. Specifically, students bring attention to the value of clearly graphic organizers as pedagogical tools, articulated rubrics, and self-assessment practices in fostering learner autonomy, metacognitive awareness, and iterative skill development. Instructor scaffolding, manifested through timely feedback, guidance on linguistic accuracy, and facilitation of group discussion, was perceived as instrumental in supporting comprehension and sustaining the learning focus. Moreover, peer collaboration and structured debates were reported to promote critical thinking and deeper cognitive engagement throughout the writing process. Model-text exposure through a reading-to-write approach strengthened students' strategic idea generation and textual organization, reinforcing their writing competence and confidence. Nonetheless, heterogeneity in learners' responses was evident, with a subset of students experiencing persistent challenges in organizing ideas and accessing support, thereby signaling the need for adaptive and differentiated instructional scaffolding. Taken together, the findings

confirm that the IDLM-guided PBL model incorporated with graphic organizers, when enacted through deliberate scaffolding and culturally responsive tasks, establishes a supportive learning environment that enhances both the cognitive and metacognitive dimensions in EFL writing, thereby offering substantive implications for curriculum development, pedagogical innovation, and future learner-centered writing research.

Funding: This study received no specific financial support.

Institutional Review Board Statement: This study was approved by the Institutional Review Board of Asahan University, Indonesia, under protocol number 002.1/188/FKIP-UNA/2025, dated February 3, 2025. Informed verbal consent was obtained from all participants, and all data were anonymized to protect participant confidentiality and used solely for research purposes.

Transparency: The authors state that the manuscript is honest, truthful, and transparent, that no key aspects of the investigation have been omitted, and that any differences from the study as planned have been clarified. This study followed all writing ethics.

Competing Interests: The authors declare that they have no competing interests.

Authors' Contributions: All authors contributed equally to the conception and design of the study. All authors have read and agreed to the published version of the manuscript.

REFERENCES

- Ab Hajis, S., & Othman, N. (2024). Navigating challenges and strategies in implementing differentiated instruction: A conceptual overview. *International Journal of Academic Research in Business and Social Sciences*, 14(8), 1209–1226. <https://doi.org/10.6007/IJARBS/v14-i8/22153>
- Abas, I. H., & Abd Aziz, N. H. (2018). Model of the writing process and strategies of EFL proficient student writers: A case study of Indonesian learners. *Pertanika Journal of Social Sciences & Humanities*, 26(3), 1815–1842.
- Ai, B. (2015). A study of the EFL writing of Chinese learners: A critical narrative. *Changing English*, 22(3), 294–306. <https://doi.org/10.1080/1358684X.2015.1056091>
- Aktepe, D., & Coskun, L. (2014). Why does a teacher need to facilitate the learning?: A comparative study. *Journal of Educational and Social Research*, 4(2), 47–50. <https://doi.org/10.5901/jesr.2014.v4n2p47>
- Al-Shidi, S. (2024). Exploring the effectiveness of hamburger and mind mapping graphic organizers in English language instruction at Gulf College, Oman. *European Journal of Foreign Language Teaching*, 8(2), 126–139. <https://doi.org/10.46827/ejfl.v8i2.5512>
- Alghamdy, R. Z. (2023). Efficacy of problem-based learning strategy to enhance EFL learners' paragraph writing and grammar skills. *Arab World English Journal*, 14(1), 43–58. <https://doi.org/10.24093/awej/vol14no1.3>
- Alimardonova, M. (2024). Studying the importance of rubrics in improving writing skills for students at B2 level. *World Bulletin of Social Sciences*, 35, 20–22.
- Allen, D., & Tanner, K. (2006). Rubrics: Tools for making learning goals and evaluation criteria explicit for both teachers and learners. *CBE—Life Sciences Education*, 5(3), 197–203. <https://doi.org/10.1187/cbe.06-06-0168>
- Almziad, A. A. M. (2024). Problem-based learning and its effect on writing performance, critical and creative thinking skills: A study at Majmaah University, Saudi Arabia. *Pakistan Journal of Life and Social Sciences*, 22(2), 18744–18761. <https://doi.org/10.57239/PJLSS-2024-22.2.0013750>
- Anderson, R. C., Chaparro, E. A., Smolkowski, K., & Cameron, R. (2023). Visual thinking and argumentative writing: A social-cognitive pairing for student writing development. *Assessing Writing*, 55, 100694. <https://doi.org/10.1016/j.asw.2023.100694>
- Anyichie, A. C., Butler, D. L., & Nashon, S. M. (2023). Exploring teacher practices for enhancing student engagement in culturally diverse classrooms. *Journal of Pedagogical Research*, 7(5), 183–207. <https://doi.org/10.33902/JPR.202322739>
- Arora, N. (2025). The role of differentiated instruction in supporting diverse learners in inclusive classrooms. *International Journal of Research Publication and Reviews*, 6(2), 5112–5116.
- Ayubi, M., Arthamena, V. D., Ikhsan, J., Rosa, Y. H. E., & Ash-Shiddiqi, M. H. (2025). The effect of the problem-based learning (PBL) model with a STEM approach on collaboration skills. *International Journal of Technology in Education and Science*, 9(3), 397–415. <https://doi.org/10.46328/ijtes.633>

- Bahri, S., Sutikno, Arifin, W. N. J. W., & Widodo, H. (2025). Development of a deep learning model: Contextual strategies for improving the profile of Pancasila high school students. *Jurnal Ilmiah Ilmu Terapan Universitas Jambi*, 9(3), 1235-1248. <https://doi.org/10.22437/jiituj.v9i3.46608>
- Benítez-Chavira, L. A., Zárate-Grajales, R. A., & Moreno-Monsiváis, M. G. (2026). Impact of problem-based learning on the development of nursing care management skills. *Teaching and Learning in Nursing*, 21(1), e70-e75. <https://doi.org/10.1016/j.teln.2025.08.001>
- Berenji, S., Saeidi, M., & Ghafoori, N. (2020). Problem-based learning and its impact on EFL learners' engagement and reading comprehension. *Journal of Language Horizons*, 4(1), 149-174. <https://doi.org/10.22051/lghor.2020.29172.1218>
- Bogaerds-Hazenberg, S. T. M., Evers-Vermeul, J., & van den Bergh, H. (2021). A meta-analysis on the effects of text structure instruction on reading comprehension in the upper elementary grades. *Reading Research Quarterly*, 56(3), 435-462. <https://doi.org/10.1002/rrq.311>
- Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3(2), 77-101. <https://doi.org/10.1191/1478088706qp063oa>
- Chang, T.-S., Li, Y., Huang, H.-W., & Whitfield, B. (2021). *Exploring EFL students' writing performance and their acceptance of AI-based automated writing feedback*. Paper presented at the Proceedings of the 2021 2nd International Conference on Education Development and Studies.
- Chigbu, G. U., Emelogu, N. U., Egbe, C. I., Okoyekwu, N. G., Eze, K. O., Nwafor, C. K., . . . Okwo, F. A. (2023). Enhancing ESL students' academic achievement in expository essay writing using digital graphic organisers: A mixed-methods research. *Heliyon*, 9(5), e15589. <https://doi.org/10.1016/j.heliyon.2023.e15589>
- Creswell, J. W., & Clark, V. L. P. (2018). *Designing and conducting mixed methods research* (3rd ed.). Thousand Oaks, CA: SAGE Publications.
- Creswell, J. W., & Poth, C. N. (2018). *Qualitative inquiry and research design: Choosing among five approaches* (4th ed.). Thousand Oaks, CA: SAGE Publications.
- Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika*, 16(3), 297-334. <https://doi.org/10.1007/BF02310555>
- DeVellis, R. F. (2017). *Scale development: Theory and applications* (4th ed.). Los Angeles, CA: SAGE.
- Dörnyei, Z., & Dewaele, J.-M. (2023). *Questionnaires in second language research: Construction, administration, and processing* (3rd ed.). New York, NY: Routledge.
- Durrant, P. (2025). What can a corpus tell us about school writing? Findings, challenges, and future directions. *Applied Corpus Linguistics*, 5(2), 100134. <https://doi.org/10.1016/j.acorp.2025.100134>
- Eldouma, S. A. A., & Elamin, A. E. A. E. (2018). Reading and writing connection: Insights into an integrative approach to developing and teaching reading and writing in EFL classrooms. *International Journal of English Language Teaching*, 6(5), 40-55.
- Fitriyah, I., Ningrum, A. S. B., & Gozali, I. (2024). An investigation of written corrective feedback in EFL writing assessment: How teachers' feedback practices meet students' expectations. *International Journal of Language Testing*, 14(1), 166-184. <https://doi.org/10.22034/IJLT.2023.411616.1275>
- Gokhale, A. A. (1995). Collaborative learning enhances critical thinking. *Journal of Technology Education*, 7(1), 22-30. <https://doi.org/10.21061/jte.v7i1.a.2>
- Goyibova, N., Muslimov, N., Sabirova, G., Kadirova, N., & Samatova, B. (2025). Differentiation approach in education: Tailoring instruction for diverse learner needs. *MethodsX*, 14, 103163. <https://doi.org/10.1016/j.mex.2025.103163>
- Graham, S., Brush, J., Fitzgerald, J., Furgeson, J., Friedrich, L. D., Greene, K., . . . Wulsin, C. S. (2016). *Teaching secondary students to write effectively (NCEE 2017 4002)*. Washington, DC: U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance.
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate data analysis* (7th ed.). Upper Saddle River, NJ: Pearson Prentice Hall.

- Haniko, P., Mubarak, H., Syamsurijal, S., Pasaribu, W., & Ichsan, I. (2024). Culturally responsive teaching: Strategies for promoting inclusivity in diverse classrooms. *Global International Journal of Innovative Research*, 2(4), 821–830.
- Helaluddin, H., Mannahali, M., Purwati, D., Alamsyah, A., & Wijaya, H. (2023). An investigation into the effect of problem-based learning on learners' writing performance, critical and creative thinking skills. *Journal of Language and Education*, 9(2), 101–117. <https://doi.org/10.17323/jle.2023.14704>
- Jumariati, J., & Arapah, E. (2024). The effects of problem-based learning on the writing skills of students across various personality types. *Journal of Language Teaching and Research*, 15(5), 1730–1740. <https://doi.org/10.17507/jltr.1505.34>
- Khan, I. A. (2014). Teachers' perceptions of the significance of local culture in foreign language learning. *Journal of English Language and Literature*, 1(3), 65–70.
- Kim, Y.-S. G. (2020). Interactive dynamic literacy model: An integrative theoretical framework for reading-writing relations. In R. A. Alves, T. Limpo, & R. M. Joshi (Eds.), *Reading-writing connections: Towards integrative literacy science* (pp. 11–34). Cham, Switzerland: Springer.
- Koçoğlu, A., & Kanadlı, S. (2025). The effect of problem-based learning approach on learning outcomes: A second-order meta-analysis study. *Educational Research Review*, 48, 100690. <https://doi.org/10.1016/j.edurev.2025.100690>
- Kök, F. Z., & Duman, B. (2023). The effect of problem-based learning on problem-solving skills in English language teaching. *Journal of Pedagogical Research*, 7(1), 154–173. <https://doi.org/10.33902/JPR.202318642>
- Leahy, S., Lyon, C., Thompson, M., & Wiliam, D. (2005). Classroom assessment: Minute by minute, day by day. *Educational Leadership*, 63(3), 19–24.
- Marashi, H., & Massoodi-Hematabadi, S. (2011). Using teacher- and student-developed graphic organizers as a writing tool. *Journal of Language and Translation*, 2(1), 79–88.
- Masita, E., Hidayat, M., & Fortunasari, F. (2025). Teachers' voices on the development of students' national identity through the embedding of local culture. *Jurnal Ilmiah Ilmu Terapan Universitas Jambi*, 9(3), 1298–1307. <https://doi.org/10.22437/jiituj.v9i3.43544>
- Maslichah, M., & Tarwiyah, S. (2017). Enhancing students' ability in writing descriptive text through graphic organizers. *Vision: Journal for Language and Foreign Language Learning*, 6(2), 116–124. <https://doi.org/10.21580/vjv6i21792>
- McMillan, J. H., & Schumacher, S. (2014). *Research in education: Evidence-based inquiry* (7th ed.). Harlow, England: Pearson Education.
- Muir, T., Douglas, T., & Trimble, A. (2020). Facilitation strategies for enhancing the learning and engagement of online students. *Journal of University Teaching and Learning Practice*, 17(3), 1–19.
- Ningsih, T. Z., Aman, A., Nasrulloh, A., Ofianto, O., Erniwati, E., Asri, Z., . . . Firza, F. (2025). Enhancing communication and collaboration skills through discovery, cooperative and problem-based learning models in Social Studies education. *Cogent Education*, 12(1), 2500110. <https://doi.org/10.1080/2331186X.2025.2500110>
- Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). United States: McGraw-Hill.
- Olson, J. M., & Krysiak, R. (2021). Rubrics as tools for effective assessment of student learning and program quality. In T. Fudge & S. Ferebee (Eds.), *Curriculum Development and Online Instruction for the 21st Century*. In (pp. 173–200). United States: IGI Global Scientific Publishing.
- Orhan, A. (2024). Online or in-class problem-based learning: Which one is more effective in enhancing learning outcomes and critical thinking in higher education EFL classroom? *Journal of Computer Assisted Learning*, 40(5), 2351–2368. <https://doi.org/10.1111/jcal.13033>
- Orhan, A. (2025). Investigating the effectiveness of problem based learning on academic achievement in EFL classroom: A meta-analysis. *The Asia-Pacific Education Researcher*, 34(2), 699–709. <https://doi.org/10.1007/s40299-024-00889-4>
- Panadero, E., Jonsson, A., Pinedo, L., & Fernández-Castilla, B. (2023). Effects of rubrics on academic performance, self-regulated learning, and self-efficacy: A meta-analytic review. *Educational Psychology Review*, 35(4), 113. <https://doi.org/10.1007/s10648-023-09823-4>

- Panjaitan, D. J., Firmansyah, F., Sapta, A., Aprilia, R., & Siregar, A. F. P. (2025). Development of mathematics learning using Batak culture-based media in Indonesia. *Jurnal Ilmiah Ilmu Terapan Universitas Jambi*, 9(3), 1249-1261. <https://doi.org/10.22437/jiituj.v9i3.43196>
- Patton, M. Q. (2002). *Qualitative research and evaluation methods* (3rd ed.). United States: Sage Publications.
- Ratminingsih, N. M., Marhaeni, A. A. I. N., & Vigayanti, L. P. D. (2018). Self-assessment: The effect on students' independence and writing competence. *International Journal of Instruction*, 11(3), 277-290. <https://doi.org/10.12973/iji.2018.11320a>
- Sala-Bubará, A., & Castelló, M. (2023). Exploring writing processes in authentic writing tasks: A multimodal mixed-method approach. *Journal of Second Language Writing*, 61, 101038. <https://doi.org/10.1016/j.jslw.2023.101038>
- Shehzad, N., & Charles, T. (2023). Exploring the impact of instructor social presence on student engagement in online higher education. *Contemporary Educational Technology*, 15(4), ep484. <https://doi.org/10.30935/cedtech/13823>
- Solfitriyuzzahro, S., Santihastuti, A., & Erfan, E. (2019). Grammatical accuracy using teacher's written corrective feedback. *Eralingua: Jurnal Pendidikan Bahasa Asing dan Sastra*, 3(2), 75-85. <https://doi.org/10.26858/eralingua.v3i2.9051>
- Styati, E. W., & Irawati, L. (2020). The effect of graphic organizers on ELT students' writing quality. *Indonesian Journal of EFL and Linguistics*, 5(2), 279-293. <https://doi.org/10.21462/ijefl.v5i2.283>
- Teddlie, C., & Tashakkori, A. (2009). *Foundations of mixed methods research: Integrating quantitative and qualitative approaches in the social and behavioral sciences*. Los Angeles, CA: SAGE.
- Teng, M. F. (2022). Effects of cooperative-metacognitive instruction on EFL learners' writing and metacognitive awareness. *Asia Pacific Journal of Education*, 42(2), 179-195. <https://doi.org/10.1080/02188791.2020.1835606>
- Westwood, P. (2004). *Learning and learning difficulties: A handbook for teachers*. Camberwell, Australia: ACER Press.
- Widiartini, N. K., & Sukerti, N. W. (2023). The effect of self-assessment and students' learning autonomy towards students' performance in vocational education. *Jurnal Pendidikan dan Pengajaran*, 56(1), 172-182. <https://doi.org/10.23887/jpp.v56i1.60491>
- Williams, J. (2005). *Teaching writing in second and foreign language classrooms*. Boston, MA: McGraw-Hill.
- Wolf, K., & Stevens, E. (2007). The role of rubrics in advancing and assessing student learning. *Journal of Effective Teaching*, 7(1), 3-14.
- Yew, E. H. J., & Goh, K. (2016). Problem-based learning: An overview of its process and impact on learning. *Health Professions Education*, 2(2), 75-79. <https://doi.org/10.1016/j.hpe.2016.01.004>
- Yunus, W. N. M. W. M. (2020). Written corrective feedback in English compositions: Teachers' practices and students' expectations. *English Language Teaching Educational Journal*, 3(2), 95-107. <https://doi.org/10.12928/eltej.v3i2.2255>