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Enhancing Elementary Students' Procedural Writing through a Hybrid Approach of Problem-Based Learning and Differentiated Instruction

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Abstract

Objective: This study aims to examine the effectiveness of a hybrid instructional model integrating Problem-Based Learning (PBL) and Differentiated Instruction (DI) to improve procedural writing skills among fifth-grade elementary students in Indonesia. **Novelty:** The study introduces a combined PBL–DI framework within a Classroom Action Research (CAR) design, specifically applied to genre-based procedural writing instruction in diverse elementary classrooms. **Methods:** The research employed a two-cycle Classroom Action Research (CAR) design involving 31 students. Learners engaged in real-world writing tasks tailored to their readiness levels, interests, and learning profiles. Data were collected through writing assessments, observation sheets, reflection journals, field notes, and interviews, and analyzed using descriptive statistics and thematic analysis. **Results:** Student writing mastery improved significantly from 32% in the pre-action stage to 84% at the end of Cycle II. Qualitative findings indicated increased engagement, greater autonomy in writing, and enhanced self-efficacy. Contextual problem-solving tasks, scaffolded support, and iterative teacher reflection contributed to both cognitive and affective development. **Conclusions:** Integrating PBL and DI provides an effective, student-centered framework for enhancing procedural writing skills and offers a promising approach for genre-based writing instruction in diverse elementary school settings.

Keywords: Procedural writing, Problem-Based Learning, Differentiated Instruction, Elementary education, Writing instruction.

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INTRODUCTION

Writing proficiency, particularly in the genre of procedural texts, is a vital component of primary education (Popovic, 2021). It enables students not only to communicate clear and sequenced instructions but also to develop logical thinking and structured expression skills closely linked to broader academic success and 21st-century competencies (Chu et al., 2021; González-Pérez & Ramírez-Montoya, 2022). However, many elementary students continue to struggle with procedural writing, often producing texts that lack coherence, proper sequencing, and genre-specific linguistic features (Philippakos et al., 2023; Turgut Dost, 2025). This calls for innovative instructional strategies that are responsive to diverse student needs and learning profiles.

In recent years, the Problem-Based Learning (PBL) model has gained traction in primary education due to its emphasis on active inquiry (Rafiq et al., 2023), critical thinking (Anggraeni et al., 2023), and real-world problem-solving (Karan & Brown, 2022). At the same time, Differentiated Instruction (DI) has been increasingly recognized as a means to address the varying readiness levels, interests, and learning styles present in diverse classrooms (Wong et al., 2023). Both PBL and DI have shown promise independently in improving student learning outcomes; however, there remains limited empirical research on their integrated application, particularly in the context of procedural text writing among elementary students.

Several recent studies have addressed either PBL or DI in primary writing instruction. For instance, Rizkiana & Setiawan (2022) found that PBL can improve students' engagement and organization in writing expository texts. In a similar study, Grecu (2023) demonstrated improvements in students' descriptive writing abilities when DI was applied to accommodate different literacy levels. Al-Mutawah (2022), Mumpuni et al. (2025), and Hasim et al. (2022) applied a PBL framework in science-integrated writing and reported increased student motivation. Meanwhile, Domke & Cerrato (2024) argued for the necessity of tailoring instruction using DI in multilingual classrooms to enhance written expression.

Other notable contributions include Loveall (2024), who noted the impact of student-centered models on procedural genre writing; Mehany (2022), who explored DI in vocabulary development for early writing; and Wang (2021), who reported enhanced writing structure through task-based learning combined with DI. Furthermore, Rivera (2024) successfully applied PBL to project-based writing tasks, achieving measurable success in idea development. Recent work by Nilufar (2024) investigated differentiated learning environments in writing workshops, highlighting their role in reducing writing anxiety. Lastly, Rachmawati et al. (2022) examined how hybrid pedagogies support inclusive literacy outcomes in Indonesian primary schools.

Despite these advancements, few studies have systematically examined the synergistic effect of integrating PBL with DI on procedural writing outcomes. Most research has either focused on general writing performance or isolated instructional strategies, lacking contextualization in specific writing genres or primary-level curriculum frameworks. Furthermore, there is a scarcity of classroom-based intervention research that reflects practical implementation challenges and localized curriculum standards.

This research aims to address these gaps by investigating how a hybrid instructional model—Problem-Based Learning integrated with Differentiated Instruction—can enhance the procedural text writing skills of Grade 5 students in an Indonesian elementary school. It aims to provide empirical evidence of how this approach fosters student engagement, accommodates learner diversity, and improves genre-specific writing outcomes.

METHODS

This study employed a Classroom Action Research (CAR) design based on the model developed by Kemmis and McTaggart (2013), which consists of four systematic stages: planning, acting, observing, and reflecting. The CAR framework was selected because it enables iterative and reflective cycles that directly address instructional challenges within an authentic classroom context. By applying this cyclical process, the researcher was able to continuously refine instructional strategies based on evidence gathered during implementation. The study was conducted over two cycles, each comprising two instructional sessions, at a public elementary school in East Jakarta, Indonesia.

The participants of the study were 31 fifth-grade students, both boys and girls, aged between 10 and 11 years. A total population sampling technique was employed, as all students in the class were involved in the intervention to capture the natural dynamics of classroom instruction. Prior to the implementation of the study, formal permissions and informed consent were obtained from the school principal, the classroom teacher, and the students' guardians. Ethical considerations were carefully observed, including maintaining participants' anonymity and ensuring confidentiality throughout the research process in accordance with established educational research guidelines.

The instructional intervention applied a hybrid learning approach that integrated Problem-Based Learning (PBL) and Differentiated Instruction (DI) to improve students' procedural text writing skills in alignment with national curriculum standards. Through the PBL component, students engaged in authentic, real-life tasks requiring them to compose procedural texts, such as explaining how to make a simple sandwich or how to plant seeds. These contextual problems were designed to stimulate critical thinking and meaningful writing practice.

The DI component complemented this approach by adapting instruction to students' readiness levels, learning preferences, and interests, as identified through pre-assessment data. Differentiation strategies included tiered assignments, flexible grouping, and varied scaffolding supports such as writing templates, peer mentoring, and audio prompts. Each research cycle began with lesson planning based on diagnostic findings, followed by implementation of the hybrid PBL-DI model across two sessions. The process continued with systematic observation and documentation of student activities and learning outcomes, and concluded with reflective evaluation to refine instructional strategies for the subsequent cycle.

To strengthen methodological triangulation and enhance the validity of the findings, multiple data collection instruments were utilized. Students' procedural writing performance was assessed using a structured rubric focusing on four components: content, text structure, language use, and writing mechanics. Each component was scored using a four-point Likert scale to allow detailed measurement of progress across cycles.

Structured observation sheets were employed to monitor teacher instructional practices and student engagement during the intervention. These observations provided valuable insights into classroom interactions and the fidelity of the hybrid model's implementation. In addition, students completed reflection journals containing open-ended prompts that encouraged them to describe their learning experiences, challenges encountered, and perceived development in writing skills.

Teacher field notes were recorded daily to document instructional adjustments, student responses, and the overall classroom atmosphere. These narrative records enriched the interpretation of quantitative findings and supported the identification of emerging themes. Furthermore, semi-structured interviews were conducted with selected students and the

classroom teacher to obtain in-depth feedback regarding the effectiveness of the integrated PBL and DI strategies. The interviews complemented other data sources, contributing to a more comprehensive understanding of the intervention's impact.

Quantitative data derived from writing scores were analyzed using descriptive statistics, including mean scores, percentages, and gain score comparisons across cycles. Improvement was determined by increases in average scores and the percentage of students achieving the Minimum Mastery Criteria (KKM) of 65. Meanwhile, qualitative data from field notes, student reflections, and interviews were analyzed thematically using an inductive coding approach to identify recurring patterns related to student engagement, the impact of differentiation, and perceived learning challenges.

To ensure validity and reliability, all research instruments were reviewed by two experts in language education and piloted in a comparable class. Inter-rater reliability for the writing assessment was calculated using Cohen's kappa, resulting in a coefficient of 0.87, which indicates a high level of agreement. To further enhance trustworthiness, member checking was conducted with both students and the classroom teacher to confirm the accuracy of qualitative interpretations.

RESULTS AND DISCUSSION

Improvement in Procedural Writing Performance

The application of a hybrid instructional model combining Problem-Based Learning (PBL) and Differentiated Instruction (DI) led to significant improvements in students' procedural writing performance. The study was conducted in two cycles of classroom action research, involving a total of 31 fifth-grade students in the intervention process.

Table 1. Improvement in procedural writing performance across research stages

Stage	Total Students	Students Achieving Mastery (≥65)	Students Below Mastery (<65)	Class Average Score
Pre-Action	31	10 students (32%)	21 students (68%)	67.80
Cycle I	31	18 students (58%)	13 students (42%)	75.60
Cycle II	31	26 students (84%)	5 students (16%)	84.20

At the pre-action stage, baseline data were collected through diagnostic writing assessments. Only 10 students (32%) achieved scores at or above the Minimum Mastery Criteria (KKM) of 65, while 21 students (68%) were categorized as not yet competent. The average class score was 67.8, indicating that the overall writing ability was still below expectation, particularly in aspects of procedural coherence, use of imperative sentences, and sequencing of steps.

During Cycle I, students engaged in writing tasks derived from authentic, real-world problems (e.g., how to prepare a simple meal or perform a school-related task). Basic differentiated instruction was introduced through flexible grouping, writing guides, and pictorial prompts. As a result, the number of students who met the KKM increased to 18 students (58%), while 13 students (42%) remained below the threshold. The class average improved to 75.6, indicating a positive response to the initial intervention.

In Cycle II, differentiation strategies were enhanced to include tiered writing tasks, customized feedback, and the use of checklists tailored to individual learning profiles. Problem-based scenarios were made more personalized and reflective of students' everyday

experiences, which led to increased motivation and a more precise understanding of procedural structure. Following this refinement, 26 students (84%) successfully met or exceeded the KKM, while only five students (16%) remained below the standard. The class average score rose significantly to 84.2.

These findings clearly show a consistent upward trend in student performance. The number of students achieving procedural writing mastery based on the defined KKM increased by 52 percentage points from the pre-action stage to Cycle II. More importantly, qualitative observation and teacher reflections indicated that students developed greater autonomy, collaboration, and clarity in their writing as they progressed through each cycle.

Qualitative Insights: Engagement, Motivation, and Support

In addition to quantitative improvement in writing scores, qualitative data collected from student reflection journals, semi-structured interviews, and teacher field notes provided rich insights into the affective and behavioral impacts of the hybrid Problem-Based Learning (PBL) and Differentiated Instruction (DI) approach. Using a thematic analysis method (Braun & Clarke, 2006), data were coded inductively, resulting in the identification of three dominant themes: (1) increased engagement, (2) relevance of differentiated support, and (3) enhanced self-confidence and writing autonomy.

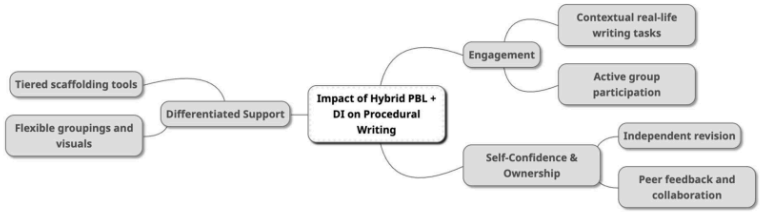

Figure 1. Thematic map of qualitative insights on student experience

Theme 1: Increased Engagement through Contextualized Learning

Students consistently reported high levels of interest and enjoyment in writing tasks that were contextual and familiar to them. PBL scenarios such as "how to make instant noodles" or "how to prepare your school bag" resonated with their lived experiences, making learning more relatable and purposeful. One student wrote in their reflection journal:

> *"It was easier to write because I know how to do it in real life. I don't feel confused when writing the steps."*

Teacher observations also noted that students were more focused, cooperative, and expressive during group discussions in the writing process. The collaborative problem-solving structure of PBL created opportunities for peer-to-peer interaction, which further boosted engagement.

Theme 2: Relevance and Responsiveness of Differentiated Support

Differentiated strategies—such as the use of sentence starters, visual organizers, tiered writing tasks, and peer mentoring—were perceived by students as supportive and empowering. These instructional adjustments helped reduce cognitive overload, allowing students to access the writing task at their respective levels of readiness. Struggling students reported that step-by-step guides and visuals helped them organize their ideas better, while advanced students appreciated the opportunity to explore more complex vocabulary and transitions.

The teacher's field notes documented behavioral changes among students who were previously reluctant to write. With differentiated scaffolds in place, these students showed improved participation and output, indicating that removing barriers through DI can unlock student potential.

Theme 3: Enhanced Self-Confidence and Ownership in Writing

As students became more familiar with both the procedural genre and the collaborative structure of learning, their self-confidence in writing improved markedly. In Cycle II, a noticeable shift occurred: students began revising their drafts independently, seeking feedback, and sharing strategies with their peers. This evolution reflected not only improved technical skills but also increased ownership of the writing process. One student shared in an interview:

> *"Now I can fix my writing by myself. I check the steps, and I help my friend too. That makes me proud."*

Such responses affirm that the hybrid model not only improves academic outcomes but also nurtures social-emotional growth, particularly in developing writing self-efficacy and peer collaboration skills—important components of 21st-century literacy.

The Role of Teacher Reflection and Iterative Planning

The teacher's role as a reflective practitioner was crucial in refining the instructional process between Cycle I and Cycle II of this study. Reflections from Cycle I logs highlighted persistent challenges, particularly for low-performing students who struggled with crafting complete procedural sentences and consistently using the characteristic linguistic features of procedural texts. These insights directly informed the strategic adjustments made for Cycle II. Such adaptive strategies included the more targeted use of scaffolding tools, like simpler procedural text examples and image-based worksheets with visual cues, specifically designed to support students with lower abilities. Conversely, higher-achieving students were given advanced analytical and exploratory tasks through more complex worksheets, showcasing the flexibility to modify content, process, and product.

This inherent flexibility within Differentiated Instruction was key, enabling the teacher to tailor instruction to observed student needs. For instance, the more flexible time management in Cycle II enabled focused one-on-one guidance for groups requiring intensive support. Furthermore, introducing specific practice for imperative verbs and sequential conjunctions through language games directly addressed the linguistic inconsistencies identified earlier. These adaptations demonstrate how in-depth observation and direct analysis of student needs were seamlessly integrated to improve teaching strategies.

The Classroom Action Research (CAR) framework effectively facilitated this continuous improvement through a cycle of reflection and action. Data from Cycle I, including evaluation results and observations of student activities, formed the bedrock for analyzing unfulfilled learning needs. Based on this analysis, the planning for Cycle II was collaboratively designed to optimize differentiated instruction and rectify the identified shortcomings. This iterative process highlights that sustainable change in literacy instruction is most effectively achieved through ongoing cycles of evaluation, responsive planning, and adaptive implementation.

Discussion

The results of this study provide compelling evidence that integrating Problem-Based Learning (PBL) with Differentiated Instruction (DI) can significantly enhance elementary students' ability to produce procedural texts. The steady increase in writing performance—from 32% mastery in the pre-action stage to 84% in Cycle II—demonstrates the positive cumulative effect of this hybrid approach. Beyond numerical improvements, the intervention also contributed meaningfully to students' engagement, confidence, and autonomy as writers, as revealed by qualitative insights.

Integrating PBL and DI: Bridging Cognitive and Affective Domains

The success of this hybrid model aligns with existing research that recognizes the benefits of both PBL and DI when applied thoughtfully in literacy instruction. PBL encourages students to solve authentic, real-world problems that require critical thinking and application of knowledge (Kek & Huijser, 2011; Wardani & Fiorintina, 2023). In this study, the use of familiar contexts—such as writing about everyday tasks—made procedural writing more accessible and purposeful, thereby increasing students' intrinsic motivation. This supports the assertion by Poluru (2025) that relevance and authenticity in PBL promote deeper engagement and transfer of learning.

Simultaneously, the layered support mechanisms inherent in DI allowed for instruction that was sensitive to students' diverse readiness levels and learning profiles. The provision of tiered writing tasks, visual scaffolds, and flexible grouping ensured that all students could participate meaningfully, regardless of their initial proficiency. This confirms the findings of Goyibova et al. (2025), who emphasized that differentiation, when applied at the levels of content, process, and product, enhances access and equity in learning environments.

Enhancing Writing Competency through Structured Scaffolding

A closer look at student performance reveals that structured scaffolding played a pivotal role in bridging the gap between emerging and proficient writers. Many students initially struggled with genre-specific features of procedural texts, particularly in organizing sequential steps and using imperative verbs correctly. However, by Cycle II, a clear improvement was observed, not only in students' adherence to genre conventions but also in the clarity and coherence of their texts.

These findings mirror those of Triastuti et al. (2022), who argue that genre-based pedagogy must be accompanied by explicit modeling and guided practice to be effective. In this study, scaffolded checklists, guided outlines, and the teacher's real-time feedback contributed to building students' genre awareness and functional language skills—essential elements of academic writing in primary school settings.

Motivation, Engagement, and Writing Self-Efficacy

The qualitative findings strongly highlight the affective benefits of the intervention. The thematic analysis identified that students not only became more engaged but also reported a stronger sense of ownership over their writing. The progressive increase in independent revision, peer feedback exchanges, and active participation during writing tasks in Cycle II reflects the growth of writing self-efficacy, a key predictor of sustained writing success (Busby & Malone, 2023).

Moreover, student reflections indicate that writing anxiety—often associated with low-performing students—was mitigated through the supportive environment created by DI strategies. The safe space for experimentation, combined with contextual tasks and social collaboration through PBL, allowed students to build both competence and confidence simultaneously. This is consistent with the work of Zimmerman (1995), who emphasized the role of self-beliefs and guided mastery in academic learning.

The Role of Teacher Reflection in Instructional Adaptation

The iterative nature of Classroom Action Research (CAR) was central to the intervention's success. Teacher reflection between cycles enabled the timely identification of instructional gaps and the adaptation of effective strategies. In this study, the ability to redesign instructional delivery based on real-time observation—such as adjusting scaffolding intensity or grouping strategies—demonstrated the value of practitioner-led inquiry in improving pedagogical practices.

Such adaptability aligns with Cochran-Smith & Lytle's (2015) concept of the "teacher as knowledge generator," where reflection and action are intertwined in the pursuit of professional growth and classroom improvement. Importantly, the CAR framework ensured that the teaching was data-driven, student-centered, and grounded in a culture of continuous improvement.

Contribution to the Field and Pedagogical Implications

This study contributes to the growing body of research advocating for the integration of constructivist and personalized pedagogies in early-grade writing instruction. While prior studies have examined PBL and DI independently, few have explored their combined effect on a specific writing genre within a primary education context. The results of this research suggest that the hybridization of PBL and DI can serve as an effective framework for improving genre-based writing, particularly when implemented through reflective teaching cycles.

Pedagogically, this implies that teachers should be encouraged to adopt flexible, student-responsive models that go beyond one-size-fits-all instruction. Professional development programs should emphasize not only technical knowledge of PBL or DI, but also how to dynamically adapt them through ongoing classroom assessment and reflection. Additionally, curriculum developers may consider embedding scaffolded problem-based tasks and differentiation options within national writing curricula to promote equity and excellence in literacy learning.

CONCLUSION

This study demonstrates that integrating Problem-Based Learning (PBL) and Differentiated Instruction (DI) within a reflective Classroom Action Research (CAR) framework is a powerful approach to improving procedural writing skills among elementary students. The significant

rise in student achievement—from 32% procedural writing mastery in the pre-action stage to 84% in Cycle II—provides empirical support for the effectiveness of this hybrid instructional model in enhancing both cognitive outcomes and learner engagement.

Beyond the quantitative gains, the intervention promoted substantial growth in affective and behavioral aspects. Students exhibited increased motivation, deeper engagement, and a growing sense of self-confidence and ownership in their writing process. Thematic analysis of qualitative data revealed that real-life contextual tasks, scaffolded differentiation, and collaborative writing environments were key contributors to these positive developments. Moreover, teacher reflections and iterative adaptations throughout the cycles ensured responsive, data-driven instruction that addressed the diverse needs of learners.

These findings suggest that combining authentic, problem-based tasks with flexible, differentiated supports can create an inclusive and empowering literacy learning environment, especially in diverse primary school contexts. Importantly, the reflective cycle of planning, action, observation, and refinement within CAR proved essential for driving sustainable instructional improvement.

In light of these outcomes, it is recommended that teacher professional development programs incorporate training on hybrid PBL–DI models and foster teacher autonomy in curriculum adaptation. Educational policymakers and curriculum developers should consider embedding differentiated, problem-based approaches within genre-based writing curricula to promote equitable literacy achievement. Future research may expand on this study by examining the long-term retention of procedural writing skills and exploring the applicability of the hybrid model across other genres and grade levels.

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