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# Procedural Text Teaching Materials Based on VBA Microsoft Excel to Improve Students' Writing Skills

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**Abstract**

This study aims to develop procedural text teaching materials based on VBA Microsoft Excel to improve elementary school students' writing skills. This research is motivated by the need for engaging, practical learning media that utilizes simple technology. The method used is Mixed Methods Research with an Exploratory Sequential strategy, beginning with qualitative data collection through observation and interviews, followed by quantitative data collection in the form of pretest and posttest. The research subjects were 30 students from Cimahi City. The research results showed that the average pretest score of 65 increased to 82 in the posttest, with an N-Gain of 0.53 (medium category). The interview results support this finding, indicating that students felt the VBA-based teaching material helped them understand the steps of writing procedural texts more easily and attractively. The conclusion of this study shows that procedural text teaching materials based on VBA Microsoft Excel are feasible to support Indonesian language learning in elementary schools.



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## INTRODUCTION

In line with the rapid development of the times, writing skills have increasingly been recognized as essential competencies in elementary education. Within the Indonesian context, the Kurikulum Merdeka positions writing as an integral element of the literacy profile that students are expected to achieve, requiring them to communicate ideas logically and systematically through various text forms, including procedural texts. Such an emphasis indicates that writing is not only a general language skill but also a fundamental standard in primary education. At the global level, numerous studies have consistently shown that writing constitutes a crucial component of literacy, which needs to be reinforced through innovative approaches and the integration of technology-supported instruction (Alharbi, 2023; Cattoni, 2024; Chen & Hsu, 2022).

Writing serves as a medium to report and inform, with objectives that can only be achieved when individuals are able to organize their thoughts and express them with clarity. It is not a skill that can be simply transferred through direct instruction; rather, it must be nurtured through consistent practice and sustained motivation (Camacho et al., 2020). Writing proficiency can also be enhanced through continuous guidance, as it represents a complex activity that demands both critical and creative thinking (Kiptiyah, 2019). Moreover, successful writing requires mastery of language as well as logical reasoning (Altun, 2023). At the global level, research increasingly demonstrates that evidence-based writing instruction combined with digital support significantly improves clarity, organization, and overall writing outcomes (González-Laguna et al., 2024; Graham & Harris, 2022). These findings highlight that writing is not only a cognitive skill but also a multifaceted competency that connects linguistic knowledge, higher-order thinking, and communicative ability. Despite its recognized importance, many students continue to face difficulties in developing writing skills, particularly in producing structured and coherent texts. This gap underlines the necessity of adopting more effective instructional approaches that integrate guidance, practice, and technology to foster writing competence from an early stage of education.

In the context of primary school instruction, the teaching of writing is frequently grounded in established theoretical frameworks such as genre-based pedagogy, which trains students to recognize and construct various text types (Derewianka & Jones, 2012), and the process writing model, which guides learners through stages of planning, drafting, revising, and publishing (Graves, 1983). Both approaches provide systematic steps that not only enable elementary students to produce texts more effectively but also encourage creativity, independence, and critical engagement with language. At the same time, recent international studies reveal that digital innovations—such as Web 2.0 tools, learning analytics, and interactive feedback mechanisms—offer significant potential to enhance writing motivation and skill development (Khalil & Ebner, 2023; Kızıltaş & Kultaş, 2025; Limpo & Alves, 2023). By integrating these pedagogical models with technological supports, writing instruction can become more adaptive, student-centered, and responsive to the evolving demands of literacy in the digital era.

Given these considerations, the present study focuses on supporting students' ability to write procedural texts, a type of non-literary text that explains step-by-step processes. Procedural texts play an important role in helping readers understand sequences systematically while also encouraging logical and orderly thinking (Fontan & Saint-Dizier, 2008; Nandy et al., 2024). In the digital era, teachers are encouraged to adopt innovative and practical learning media, such as VBA Microsoft Excel, which can provide interactive and structured writing support aligned with the goals of elementary education (Wijekumar, Meyer, & Lei, 2022; Yu, Hu, & Zheng, 2022). Building on these issues, the present study aims to develop and examine the effectiveness of VBA Microsoft Excel–based teaching materials for procedural text instruction in order to improve elementary school students' writing skills.

## METHOD

As outlined in the research objectives, this study employed a Mixed Methods approach with an Exploratory Sequential strategy (Creswell & Plano, 2014). The qualitative phase was conducted first to explore students' experiences and challenges in writing, which subsequently

informed the development of teaching materials. These materials were then tested in the quantitative phase through a pretest–posttest design. The participants consisted of 30 fifth-grade students in Cimahi City. Initial interviews and observations revealed that most students had limited experience with procedural text writing.

While they were generally familiar with narrative and descriptive texts, they often struggled to organize steps in a systematic manner when composing procedural texts. Furthermore, although the students reported frequent use of computers for basic activities, they had little to no prior exposure to Microsoft Excel and were entirely unfamiliar with VBA (Visual Basic for Applications). This condition presented both a challenge and an opportunity to introduce Excel-based interactive teaching materials in a structured manner. Figure 2 presents the research design, illustrating the sequential flow of the Exploratory Sequential strategy with enhanced clarity, readability, and logical order of the research phases.


Figure 2. Research Flow

The steps of the research activities carried out were as follows:

1. Problem Formulation and Needs Analysis: Identifying students' difficulties in writing procedural texts and assessing their awareness of writing skills in daily life.
2. Preliminary Activities: Providing an overview of planned research activities to teachers and students, and preparing necessary tools.
3. Qualitative Exploration: Conducting classroom observations and interviews with students and teachers to understand their challenges in writing.
4. Collaboration: Working with the elementary school to select participants and arrange learning sessions.
5. Instrument Development: Designing assessment instruments (writing rubrics, observation sheets, interview guides) and validating them through expert judgment.
6. Implementation: The intervention was conducted over four sessions, each lasting 2 × 35 minutes (70 minutes). During these sessions, students were given tasks such as (a) identifying the structure of procedural texts, (b) practicing writing simple procedural instructions (e.g., how to make a sandwich), (c) revising their texts with VBA-based feedback, and (d) producing a final procedural text using the Excel-based interactive module.
7. Evaluation: Students' writing performance was assessed through pretest and posttest scores, while qualitative feedback was collected through interviews and observation notes. Documentation was also conducted throughout the learning process.
8. Conclusion: Drawing interpretations by comparing qualitative findings with quantitative results to answer the research question.

The data collection techniques used in this study are as follows:

1. Literature Review was conducted to gather relevant theories related to the topics examined in this study.

2. Pretest was administered before the treatment was given to the subjects; this data was used to determine students' initial ability in writing procedural texts.
3. Posttest was conducted after the treatment was completed.

The data obtained from this study includes both quantitative and qualitative data, which will be processed and analyzed using Microsoft Excel and SPSS software.

## RESULTS AND DISCUSSION

### Results

The qualitative data collection results indicated that most students and teachers felt that the existing procedural text teaching materials tended to be monotonous, less interactive, and did not utilize technology familiar to students. Interviews with teachers revealed the need for teaching materials that facilitate the steps of writing procedural texts in a more systematic and practical way. Based on this input, the researcher developed a VBA module in Microsoft Excel that students can use to understand the structure of procedural texts, complete the steps, and immediately see feedback through the available automation features. The following presents the results of the students' test score analysis.

Table 1. Average Pretest and Posttest Scores of Students' Writing Skills Based on Indicators

| Indicator (Assessment Aspect) | Average Pretest | Average Posttest | N-Gain | Category |
|---|---|---|---|---|
| Content (Completeness of Steps) | 63 | 80 | 0.46 | Medium |
| Organization (Logical Order) | 64 | 83 | 0.53 | Medium |
| Language Use (Clarity & Accuracy) | 66 | 82 | 0.52 | Medium |
| Mechanics (Spelling & Punctuation) | 67 | 84 | 0.55 | Medium |
| Overall Average | 65 | 82 | 0.53 | Medium |

Table 2. Distribution of Pretest and Posttest Scores

| Score | Min | Max | Average |
|---|---|---|---|
| Pretest | 60 | 70 | 65 |
| Posttets | 78 | 90 | 82 |

The findings demonstrate a consistent improvement across all aspects of writing skills after the implementation of VBA Microsoft Excel–based teaching materials. The improvement is reflected not only in the increase in average scores but also in the normalized gain (N-Gain), which falls within the medium category. This indicates that the intervention was effective in enhancing students' performance, although there remains potential for further development.

Moreover, the statistical significance confirmed by the Wilcoxon Signed Ranks Test strengthens the evidence that the observed differences between pretest and posttest scores were not due to chance. Instead, they reflect a genuine impact of the instructional approach on students' writing abilities. This suggests that integrating technology-driven materials into language learning can foster meaningful progress and contribute to more effective skill acquisition.

These findings are reinforced by students' responses collected through interviews after using the teaching materials. Students stated that they found it easier to understand the sequence of procedural text writing steps because the VBA application in Excel provided a clear step-by-step guide. Moreover, the automation and visualization features made the learning process more enjoyable and less monotonous. Teachers also reported that this teaching material helped save

explanation time in class, as students could study independently with the help of school laptops or computers.

Thus, this study demonstrates that the VBA Microsoft Excel-based procedural text teaching material is not only feasible and practical but also effective in improving elementary students' writing skills. This teaching material product is expected to become an alternative innovative learning resource for Indonesian language subjects, especially for procedural text topics, and can be implemented in other schools to support policies for improving the quality of education at regional and national levels.

The results of this study also provide tangible contributions for teachers in offering teaching media that integrate technology with instructional content in an efficient way. By utilizing VBA Microsoft Excel, teachers are able to present procedural text writing activities more systematically and interactively, which reduces the tendency of students to feel bored when practicing writing skills. This integration is particularly important because it not only makes the learning process more engaging but also supports the development of students' critical and creative thinking.

Moreover, the use of technology-based teaching materials directly aligns with the demands of 21st-century learning, where digital competence, problem-solving, and communication skills are emphasized as core abilities. In this regard, VBA-based instructional media helps bridge the gap between traditional classroom instruction and digital innovation by allowing students to practice writing with real-time feedback. Such learning experiences encourage student autonomy and support independent study habits, which are crucial in preparing them for future challenges in education and beyond.

Finally, these findings demonstrate that the developed materials are in harmony with the current school digitalization programs implemented in Indonesia. Schools are increasingly required to integrate information technology into learning, and the use of VBA Excel modules represents a low-cost and practical solution for this purpose. Therefore, the results of this research not only strengthen the pedagogical foundation of writing instruction but also provide a scalable model that can be adapted by other schools aiming to implement digital learning innovations.

**Discussion**

The development of procedural text teaching materials based on VBA Microsoft Excel has proven effective in improving the writing skills of elementary students at SDN Cibeureum Mandiri 2 Cimahi. The increase in the overall average score from 65 to 82, with an N-Gain of 0.53, reflects a meaningful improvement in the medium category. Beyond the overall progress, the indicator-level results provide deeper insights into how technology-supported learning influences different aspects of writing. The use of innovative learning media can enhance student engagement and learning motivation. Recent international studies have also demonstrated that blended learning and technology-supported media significantly improve students' writing motivation and outcomes (Alharbi, 2023; Cattoni, 2024).

The use of information and communication technology (ICT) in learning facilitates students' understanding of material by presenting it through visual and interactive displays (Tusriyanto et al., 2024). Such interactive media help clarify abstract concepts and transform them into more concrete forms, making it easier for students to grasp the sequence of steps in writing procedural texts (Nursabila et al., 2024; Kustianti & Koesmijati, 2020). In line with this,

integrating digital tools into writing instruction has been shown to significantly enhance clarity and coherence in students' writing (Chen & Hsu, 2022).

In addition, findings from in-depth interviews indicate that students felt more motivated and supported in understanding the steps of writing procedural texts when using VBA in Microsoft Excel. The use of engaging and visually appealing learning media was reported to capture students' attention and sustain their focus, thereby facilitating the achievement of learning objectives (Aldya et al., 2025; Azzahrah et al., 2022; Elfina et al., 2024). These qualitative results reinforce international evidence that structured, interactive, and feedback-rich digital environments play a crucial role in fostering writing development (González-Laguna et al., 2024; Graham & Harris, 2022).

Furthermore, Heinich et al. (2005) stated that computer-based media such as VBA enables direct interaction between students and learning content, which can encourage independent learning. In the context of writing literacy, the importance of structured and continuous writing practice to optimally develop students' writing skills. These results are also consistent with Khalil and Ebner (2023), who highlighted the role of learning analytics in improving literacy instruction, and Kızıltaş and Kultaş (2025), who found that Web 2.0 tools effectively increased motivation and creative writing performance among elementary students.

This study is consistent with the view of Sudarsana et al. (2004) that the use of educational technology should be directed toward addressing learning challenges by providing teaching materials that are practical, efficient, and accessible. The findings also support the policy direction of Depdiknas, which emphasizes that Indonesian language learning should be supported by appropriate media to enable students to master language skills actively and productively.

The improvements observed in each writing indicator further strengthen this argument. In terms of Content, VBA-based media enabled students to better understand the completeness and sequence of procedural steps. For Organization, the interactive features supported logical structuring of ideas, which was evident in the significant increase in coherence. In the aspect of Language Use, the structured environment helped students refine word choices and sentence clarity, leading to more accurate expression. Finally, the most substantial improvement in Mechanics shows that the repetitive and feedback-rich nature of VBA exercises effectively reinforced accuracy in spelling and punctuation.

These findings are also aligned with international evidence showing that digital tools, tutoring systems, and peer feedback substantially enhance students' writing performance (Limpo & Alves, 2023; Wijekumar, Meyer, & Lei, 2022; Yu, Hu, & Zheng, 2022). Taken together, this study not only demonstrates the effectiveness of VBA Microsoft Excel–based procedural text teaching materials but also highlights that the integration of simple technological innovations can serve as a practical and scalable solution for improving multiple dimensions of students' writing skills and supporting Indonesian language learning in the digital era.

## CONCLUSION

Based on the research findings and discussion, it can be concluded that the procedural text teaching material based on VBA Microsoft Excel that has been developed is proven to be feasible and effective for improving the writing skills of elementary school students. The significant increase in the average posttest score compared to the pretest demonstrates that the

implementation of this teaching material has a positive impact on students' mastery of procedural text material.

In addition to improving learning outcomes, this teaching material also provides practical benefits as it is easy to use independently or with teacher guidance. Students become more active and interested in practicing writing with the step-by-step guidance presented interactively. Teachers are also supported in providing varied teaching media that create a more engaging and meaningful learning atmosphere.

It is expected that the VBA Microsoft Excel-based procedural text teaching material can serve as an alternative innovative learning resource in schools, as well as a reference for developing similar materials that integrate simple technology with Indonesian language content. Thus, the results of this study are expected to contribute to improving the quality of basic education and supporting the development of a productive young generation of Indonesia that is ready to face future challenges.

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