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# Development of Leveled Reading Books Based on the ADDIE Model to Improve Elementary Students' Reading Comprehension

**Sapariah[1]*, Muh. Fahrurrozi[2], Baiq Rismarini Nursaly[3]**
[1,2,3]Master of Primary Education, Universitas Hamzanwadi, Selong, Indonesia

*Corresponding Author Email: sapariah12@guru.sd.belajar.id

**Abstract:** This study aims to develop and evaluate the effectiveness of leveled reading books based on the ADDIE model to improve reading skills and text comprehension among elementary school students. This research employed a Research and Development (R&D) approach using the ADDIE model, which consists of analysis, design, development, implementation, and evaluation stages. The participants included 45 fifth-grade students, consisting of 10 students in the small-group trial and 35 students in the large-group trial. Data were collected through pretest-posttest assessments, expert validation sheets, and questionnaires. Quantitative data were analyzed using the normalized gain (N-Gain) formula, while qualitative data were analyzed descriptively. The results indicate that the developed product is valid and effective. The small-group trial showed an N-Gain score of 0.69 (moderate category), while the large-group trials demonstrated high effectiveness with N-Gain scores ranging from 0.79 to 0.80. In addition, student and teacher responses were categorized as excellent, indicating high acceptance and practicality of the product.In conclusion, leveled reading books developed through the ADDIE model are effective instructional materials for enhancing students' reading comprehension and literacy engagement. This study contributes to the development of differentiated literacy instruction in elementary education.

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## Introduction

Reading literacy is a fundamental competence that plays a crucial role in students' academic success and lifelong learning. In the context of 21st-century education, reading comprehension is not only a basic skill but also a foundation for developing higher-order thinking skills such as critical thinking and problem-solving. Recent international studies indicate that reading comprehension remains a major challenge in elementary education, particularly in developing countries, where many students still struggle to understand texts effectively (Kim et al., 2023; OECD, 2023).

At the elementary level, reading comprehension is essential for understanding subject matter across disciplines. Students with limited reading skills tend to experience difficulties in learning other subjects, which ultimately affects their overall academic performance. Empirical

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findings show that students' low comprehension ability is often associated with passive learning approaches and the lack of engaging instructional materials (Wigfield et al., 2023). Furthermore, recent studies highlight that structured literacy interventions can significantly improve students' comprehension outcomes (Guthrie & Klauda, 2023).

From a theoretical perspective, reading comprehension involves complex cognitive processes, including decoding, vocabulary acquisition, and meaning construction. Recent research emphasizes that effective reading instruction should integrate cognitive and motivational aspects to enhance student engagement (Castles et al., 2023). In addition, the integration of visual and textual elements has been shown to improve students' ability to process and retain information more effectively (Schnotz, 2023).

One of the key factors influencing students' reading comprehension is the availability of appropriate reading materials. Recent studies underscore that well-designed reading materials can significantly increase students' reading motivation, vocabulary acquisition, and comprehension skills (Slavin et al., 2023). Moreover, the use of structured and engaging reading materials has been proven to improve students' literacy performance and reading interest (Kim et al., 2023).

However, despite the growing body of research on literacy instruction, several challenges remain unresolved. First, many existing studies focus primarily on instructional strategies rather than on the systematic development of reading materials tailored to students' reading levels. Second, there is still limited research that integrates instructional design models, such as the ADDIE model, in the development of leveled reading materials. Third, empirical evidence measuring the effectiveness of such materials using robust quantitative approaches, such as normalized gain (N-Gain), remains limited in recent literature.

In the Indonesian educational context, these challenges are even more pronounced. The dominance of conventional teaching methods, limited access to engaging reading resources, and the increasing influence of digital media have contributed to declining reading interest among students. Moreover, many schools still use non-differentiated reading materials that do not align with students' varying reading abilities. As a result, students with lower reading proficiency struggle to keep up, while more advanced learners are not sufficiently challenged.

To address these issues, the development of leveled reading materials offers a promising solution. Leveled books are designed to match students' reading abilities and gradually increase in difficulty, thereby supporting differentiated instruction and scaffolding learning processes (Tomlinson, 2023). This approach allows students to build confidence, improve fluency, and enhance comprehension progressively.

The ADDIE model (Analysis, Design, Development, Implementation, and Evaluation) provides a systematic framework for developing instructional materials that are valid, practical, and effective. Recent studies emphasize that structured development models such as ADDIE can enhance the quality of educational products by ensuring continuous evaluation and improvement (Branch, 2023).

Based on the identified gaps, this study aims to develop leveled reading books using the ADDIE model and evaluate their effectiveness in improving reading skills and text comprehension among fifth-grade elementary school students. The novelty of this study lies in three main aspects: (1) the development of leveled reading materials based on a systematic

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instructional design model, (2) the integration of visual and textual elements to enhance comprehension, and (3) the use of quantitative effectiveness analysis through normalized gain (N-Gain).

## Research Method

The development of leveled reading books in this study followed the ADDIE model, which consists of five systematic and iterative stages: Analysis, Design, Development, Implementation, and Evaluation. This model was selected due to its flexibility and effectiveness in producing instructional products that are valid, practical, and effective through continuous refinement at each stage.

In the **analysis stage**, a comprehensive needs assessment was conducted to identify students' reading difficulties and learning needs. Data were collected through classroom observations, interviews with teachers and students, and analysis of curriculum documents. The findings revealed that many fifth-grade students experienced challenges in reading fluency and text comprehension, mainly due to the lack of appropriate and engaging reading materials. Additionally, existing reading resources were not aligned with students' varying reading abilities, indicating the need for leveled instructional materials.

Based on the results of the analysis stage, the **design stage** focused on planning the structure and content of the leveled reading books. The materials were designed according to students' reading levels (Level B1–B3), incorporating short texts, contextual content, and illustrative visuals to support comprehension. Furthermore, the design included reading exercises and comprehension questions aimed at enhancing vocabulary acquisition and critical thinking skills. The layout, typography, and color selection were carefully arranged to ensure readability and visual appeal for elementary school students.

In the **development stage**, the initial prototype of the leveled reading books was produced and subsequently validated by experts in content, language, and graphic design. The validation process aimed to ensure that the materials were accurate, linguistically appropriate, and visually effective. Feedback from the experts was used to revise and improve the product, resulting in a more refined and feasible instructional material that met educational standards.

Following the development phase, the **implementation stage** involved testing the product in real classroom settings through small-group and large-group trials. The small-group trial was conducted with a limited number of students to identify potential weaknesses and gather initial feedback. After revisions, the large-group trial was carried out to evaluate the effectiveness of the leveled reading books in improving students' reading skills and comprehension. During this stage, students engaged in structured reading activities guided by teachers, and their performance was measured using pretest and posttest assessments.

Finally, the **evaluation stage** was conducted to determine the overall effectiveness and feasibility of the developed product. This stage included both formative and summative evaluations. Formative evaluation occurred throughout the development process through expert validation and small-group trials, while summative evaluation was conducted after the large-group trial using quantitative data analysis, including normalized gain (N-Gain) scores,

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and qualitative feedback from students and teachers. The results of this evaluation were used to finalize the product and ensure that it effectively supports students' reading development.


**Figure 1.** The ADDIE Model in Developing Leveled Reading Books

Figure 1 illustrates the ADDIE development model used in this study, consisting of five stages: analysis, design, development, implementation, and evaluation.



 

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## Result

### Product Development Results

This study resulted in the development of leveled reading books (Level B1–B3) designed to improve reading skills and text comprehension among fifth-grade elementary school students. The development process followed the ADDIE model, including analysis, design, development, implementation, and evaluation stages.

During the analysis phase, it was found that students experienced difficulties in reading fluency and comprehension due to the lack of appropriate reading materials. Existing materials were not aligned with students' reading levels, leading to low reading motivation and limited comprehension ability. Based on these findings, leveled reading books were designed to match students' abilities and gradually increase in difficulty.

### Expert Validation Results

The developed product was evaluated by three experts: a language expert, a content expert, and a design expert. The validation results are summarized in Table 1.

**Table 1.** Expert Validation Results

| Aspect | Score | Category |
|---|---|---|
| Language | 22 | Fair |
| Content | 28 | Excellent |
| Design | 26 | Good |

The results indicate that the content aspect achieved the highest score, categorized as excellent, followed by the design aspect (good), and the language aspect (fair). These findings suggest that the product is generally valid and feasible for implementation, although minor revisions were required, particularly in language usage.

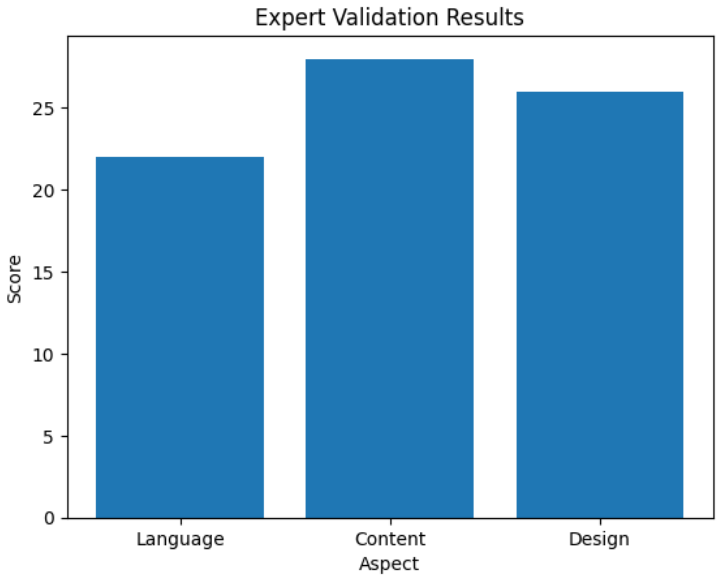


**Figure 1.** Expert Validation Results of the Developed Leveled Reading Books

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Figure 1. illustrates the expert validation results of the developed leveled reading books across three aspects: language, content, and design. The content aspect obtained the highest score (28), indicating that the material is highly appropriate, relevant, and aligned with students' learning needs. The design aspect achieved a score of 26, categorized as good, suggesting that the visual presentation, layout, and illustration support are suitable for elementary students. Meanwhile, the language aspect received the lowest score (22), categorized as fair, indicating that some improvements are needed in terms of clarity, sentence structure, and language accuracy. Overall, the results demonstrate that the developed product is valid and feasible for implementation, with minor revisions required to optimize the language component.

**Product Revision**

Based on expert feedback, several revisions were made to improve the quality of the product. These revisions included correcting capitalization and punctuation, improving sentence clarity, adjusting layout consistency, and refining the proportion between text and illustrations. The revised product demonstrated better readability and visual balance, making it more suitable for elementary school students.

**Small-Group Trial Results**

The small-group trial involved 10 students to assess the initial effectiveness of the product. The results of the pretest and posttest are presented in Table 2.

**Table 2.** Small-Group Trial Results

| Pretest | Posttest | Gain | N-Gain | Category |
|---|---|---|---|---|
| 56 | 89 | 33 | 0.69 | Moderate |

The average pretest score increased from 56 to 89 in the posttest, indicating a substantial improvement in students' reading skills. The N-Gain score of 0.69 falls into the moderate category, suggesting that the product is sufficiently effective in improving reading comprehension at the initial trial stage.

**Large-Group Trial Results**

The large-group trial involved 35 students from two schools to evaluate the effectiveness of the product on a broader scale.

**Table 3.** Large-Group Trial Results (SDN 4 Jerowaru)

| Pretest | Posttest | Gain | N-Gain | Category |
|---|---|---|---|---|
| 57.33 | 90.00 | 32.67 | 0.80 | High |

**Table 4.** Large-Group Trial Results (SDN 10 Jerowaru)

| Pretest | Posttest | Gain | N-Gain | Category |
|---|---|---|---|---|
| 57.00 | 89.50 | 32.50 | 0.79 | High |

The results show a significant increase in students' reading scores in both schools. The N-Gain values of 0.79 and 0.80 indicate high effectiveness, demonstrating that the leveled reading books are effective in improving reading skills and text comprehension.

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**Student and Teacher Responses**

Student and teacher responses were collected using questionnaires to evaluate the practicality and acceptance of the product.

The results showed that the average student response score was 68.5, categorized as excellent. Similarly, the teacher response score reached 71, also categorized as excellent. These findings indicate that the developed product is well-received and considered effective in supporting reading activities in the classroom.

**Discussion**

The findings of this study indicate that the developed leveled reading books are effective in improving students' reading skills and text comprehension, as evidenced by the moderate N-Gain score in the small-group trial (0.69) and high N-Gain scores in the large-group trials (0.79–0.80). These results confirm that structured and well-designed instructional materials significantly contribute to literacy development in elementary education (Kim et al., 2023; Slavin et al., 2023; Quinn et al., 2024).

The effectiveness of the developed product can be explained through the principle of differentiated instruction, where learning materials are adapted to students' readiness levels. Leveled reading books enable students to engage with texts that align with their cognitive abilities, reducing cognitive overload and facilitating comprehension (Tomlinson et al., 2023; Parsons et al., 2023; Smale-Jacobse et al., 2024). This alignment allows students to build reading fluency progressively, which is essential for comprehension development (Castles et al., 2023; Oakhill et al., 2024).

Moreover, the integration of visual elements in the leveled reading books plays a significant role in enhancing comprehension. The use of illustrations supports students in constructing meaning from texts by providing contextual and visual cues. Recent studies confirm that multimodal learning materials significantly improve comprehension and retention by engaging both verbal and visual processing systems (Schnotz, 2023; Mayer, 2024; Fiorella & Mayer, 2023). This is particularly important for elementary students, who rely heavily on visual support to understand abstract concepts (Kendeou et al., 2023; van den Broek et al., 2024).

The high effectiveness observed in the large-group trials suggests that the developed product is scalable and applicable in real classroom contexts. This finding aligns with previous large-scale literacy intervention studies, which demonstrate that structured reading programs significantly improve students' literacy outcomes when implemented consistently (Guthrie & Klauda, 2023; Wigfield et al., 2023; Kim & Petscher, 2024). Additionally, the use of leveled reading materials contributes to increased student engagement, which is a key factor in improving reading achievement (Schiefele et al., 2023; Taboada Barber et al., 2024).

Another important finding of this study is the positive response from both students and teachers, indicating high acceptance and practicality of the developed product. This suggests that leveled reading books not only function as instructional tools but also as motivational resources that foster reading interest. Recent research highlights that motivation and engagement are strong predictors of reading comprehension and long-term literacy development (Wigfield et al., 2023; Schaffner et al., 2023; Klauda & Guthrie, 2024).

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From a theoretical perspective, the results support constructivist learning theory, which emphasizes that learners actively construct knowledge through interaction with learning materials. The leveled reading books provide opportunities for students to engage with texts at an appropriate level, facilitating meaningful learning experiences (Kendeou et al., 2023; van den Broek et al., 2024). Furthermore, the findings align with multimedia learning theory, which states that learning is more effective when information is presented through both verbal and visual channels (Mayer, 2024; Fiorella & Mayer, 2023).

In addition, the use of the ADDIE model in developing the instructional materials contributes to the effectiveness of the product. The systematic and iterative nature of ADDIE ensures that the product is continuously refined based on feedback and evaluation. Recent studies confirm that instructional design models such as ADDIE enhance the quality and effectiveness of educational products by ensuring alignment between learning objectives, materials, and assessment (Branch, 2023; Molenda, 2023; Bond et al., 2024).

Despite the positive findings, this study has several limitations. First, the study was conducted within a limited geographical context, which may restrict the generalizability of the results. Second, the duration of the intervention was relatively short, and long-term effects on reading development were not examined. Future studies are recommended to involve larger and more diverse samples and to investigate the long-term impact of leveled reading materials on literacy development (Kim et al., 2024; Quinn et al., 2024).

Overall, this study provides strong empirical evidence that leveled reading books developed through a systematic instructional design model are effective in improving students' reading skills and text comprehension. The integration of differentiated instruction, visual support, and structured learning design contributes significantly to literacy development. These findings highlight the importance of designing instructional materials that are aligned with students' needs and abilities to support effective and sustainable literacy learning in elementary education.

## Conclusion

This study aimed to develop and evaluate the effectiveness of leveled reading books based on the ADDIE model to improve elementary students' reading skills and text comprehension. The findings demonstrate that the developed product is both valid and effective, as evidenced by the improvement in students' reading performance.

The results of the small-group trial showed a moderate level of effectiveness with an N-Gain score of 0.69, while the large-group trials indicated high effectiveness with N-Gain scores ranging from 0.79 to 0.80. These results confirm that leveled reading books can significantly enhance students' reading comprehension when the materials are aligned with their reading abilities and designed systematically.

The study contributes to the field of literacy instruction by integrating differentiated learning, visual-based materials, and instructional design through the ADDIE model. The findings highlight that appropriate and structured reading materials play a crucial role in improving students' literacy outcomes and engagement in elementary education.

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## Recommendation

Based on the findings of this study, several recommendations are proposed. First, teachers are encouraged to implement leveled reading books as part of literacy instruction to accommodate students' diverse reading abilities and to support differentiated learning in the classroom. Second, schools should provide adequate access to leveled reading materials and integrate them into regular literacy programs to foster a sustainable reading culture.

Furthermore, future research is recommended to explore the long-term impact of leveled reading books on students' literacy development and to investigate their integration with digital learning platforms. Expanding the study to different educational contexts and larger sample sizes is also suggested to enhance the generalizability of the findings.

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