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DEVELOPMENT OF GOOGLE SITES-BASED E-LEARNING TO ENHANCE READING COMPREHENSION SKILLS OF NARRATIVE TEXTS FOR 5TH GRADE ELEMENTARY SCHOOL STUDENTS

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Abstract: The development of digital technology necessitates the availability of interactive, flexible learning media that can enhance student engagement in the learning process. This study aims to analyze the effectiveness of Google Sites-based e-learning media in improving the reading comprehension skills of narrative texts among 5th-grade students. The research method employed a quasi-experimental design with a pretest-posttest control group model, involving 48 participants, consisting of an experimental class and a control class. The research instruments included a reading comprehension test, observation sheets, and student response questionnaires. The results showed that the web-based learning media significantly improved students' reading comprehension skills, as indicated by an average N-Gain of 0.77 (high category) in the experimental class, which was superior to the control class with an N-Gain of 0.47 (moderate category). Additionally, students showed very positive responses to the media's appearance, interactivity, and ease of access. These findings confirm that the integration of web-based digital media can support self-directed learning, increase multimodal engagement, and strengthen the text comprehension process. Therefore, Google Sites proves to be an effective modern learning media that can be implemented in language learning, particularly in enhancing reading comprehension skills.
Keywords: *Google sites; e-learning; reading comprehension; narrative texts; web-based learning.*

INTRODUCTION

Reading comprehension is a foundational skill in the literacy development of elementary school students (Susilawati, 2023; Wei, 2023). In higher grades, such as grade V, students are expected not only to read technically but also to understand content, identify main ideas, make inferences, and connect the information in the text with their own knowledge and experiences. This competency is crucial for the students' success in other subjects. This is in line with the findings of Atin et al. (2024) and Nadiyah et al. (2023), which indicate that the ability to comprehend reading material is greatly influenced by student interest and active engagement in the literacy process. However, several reports show that the reading comprehension abilities of Indonesian students still require serious attention (Ajideh et al., 2024; Kit et al., 2024; Hidayat et al., 2024). The 2022 Programme for International Student Assessment (PISA) results reveal that Indonesian students' reading literacy is below the OECD average, with weaknesses in understanding implicit information, evaluating text content, and making text-based inferences (OECD, 2023). This is further supported by Amelia et al. (2024), who found that Indonesia's reading literacy scores are still in the low category. Recent international studies also emphasize that students' online reading comprehension remains weak and requires more adaptive literacy strategies (Habók et al., 2024).

Interest and reading habits are also important factors in improving students' reading comprehension skills (Nayeem et al., 2025;

Puripunyavanich, 2025; Darzhinova, 2025). Windi et al. (2025) found a significant relationship between reading interest and reading comprehension skills in elementary school students, especially in higher grades. This study reinforces the view that improving literacy depends not only on the teaching materials and methods but also on students' internal motivation (Dewi et al., 2025; Rakha, 2023). This aligns with research by Wulandari et al. (2023), which found that regular reading habits improve students' ability to understand text structure and content. International findings also show that metacognitive reading strategies used in digital environments substantially contribute to comprehension improvement (Anggia & Habók, 2024). Thus, reading instruction in elementary schools has not fully addressed the challenges of 21st-century literacy development and needs to be strengthened through innovative and contextual learning media (Torky & Ahmed, 2025; Oktaviani & Chan, 2023).

At the elementary school level, especially in narrative text learning, common issues include a lack of variety in teaching strategies and media (Sari & Mahendra, 2025; Kusuma et al., 2023). Teachers still tend to use conventional methods such as reading aloud, answering questions, and simple Q&A (Zahara & Jupri, 2022). Meanwhile, the characteristics of elementary school students, who are at the concrete operational stage, require more engaging, interactive, and accessible learning media (Mustaghfirotus et al., 2025). The lack of digital media integrated systematically with materials results in less effective reading instruction and fails to sustain students' interest in learning (Ajani et al., 2024; Merta et al., 2023). Additionally, the limited availability of teaching materials that support independent and collaborative learning means students do not have the opportunity to explore texts in a more modern and meaningful way (Andika & Sunanto, 2025).

In the context of the Merdeka Curriculum, teachers are encouraged to use digital technology as adaptive and interactive learning media that can facilitate differentiated learning (Sakinah et al., 2025). The development of digital media is becoming increasingly relevant given the rapid advancement of information technology and the increasing use of digital devices by students (Anggia & Habók, 2024). One platform that can be integrated into learning is Google Sites, a simple website creation platform that allows teachers to organize learning content in an engaging, structured way and integrate it with other Google services such as Google Forms, Google Drive, YouTube, and Google Classroom (Bara et al., 2024; Mulyaningsih et al., 2023; Sholahuddin & Rini, 2025). These features make Google Sites a potential e-learning medium to support reading comprehension learning, especially in presenting narrative texts, interactive exercises, instructional videos, and quick feedback (Wahyuningsih & Lidyasari, 2025; Hartari & Putra, 2025; Aeni et al., 2024).

Although Google Sites has been widely used in online learning, research on its development to improve reading comprehension skills for elementary school students is still limited (Destriana et al., 2024). Most previous studies focused on the use of Google Sites for general learning, classroom management, or information delivery, rather than specifically for reading literacy. Therefore, there is a research gap regarding how Google Sites can be pedagogically developed to meet the needs of reading comprehension instruction in grade V elementary school. Moreover, there has been little research testing the validity, practicality, and effectiveness of Google Sites-based media in reading literacy contexts in elementary schools, particularly through a Research and Development (R&D) approach.

The urgency of this research lies in the need to present e-learning media that not only utilizes technology but is also designed based on students' needs and the characteristics of narrative text materials. Google Sites-based e-learning media has the potential to be a solution because it is accessible anytime, supports independent learning, presents materials visually and interactively, and facilitates formative assessments through the integration of Google Forms. Thus, the development of this media is expected to address the challenges of reading comprehension learning that have long been obstacles in elementary schools.

Based on this background, this research offers novelty by developing Google Sites-based e-learning specifically designed to enhance reading comprehension skills of narrative texts for fifth-grade elementary school students, along with comprehensive validity, practicality, and effectiveness testing. The media developed not only serves as a learning resource but also as an evaluation and self-learning tool integrated within one digital platform.

METHOD

This study adopted a Research and Development (R&D) design using the Alessi and Trollip model,

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which consists of three systematic stages: planning, designing, and developing the instructional product. This framework was selected because it provides a structured and iterative approach for creating high-quality digital learning media that align with pedagogical needs and user characteristics. The Alessi-Trollip model emphasizes three core attributes for each stage: quality standards, ongoing evaluation, and project management, ensuring that the developed educational media is valid, practical, and effectively implemented (Sugiyono, 2021; Salsabilah et al., 2023).

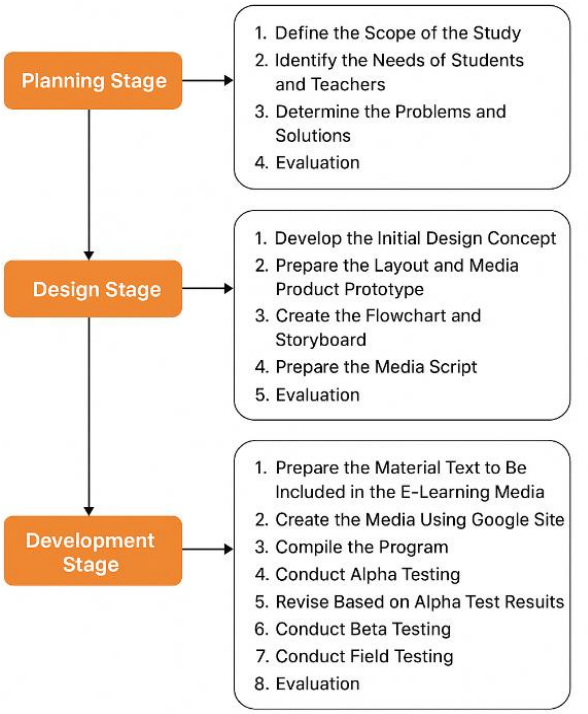


Figure 1. *Research procedure*

Thus, utilizing the Alessi-Trollip R&D model provides a structured, empirically documented framework that is highly suitable for this study, which aims to develop and test digital learning media to enhance reading comprehension skills of narrative texts for elementary school students.

The research was conducted at SDN 2 Tebing Bulang, involving two intact classes of fifth-grade students. A total of 48 students participated, with Class VA (23 students) serving as the experimental group and Class VB (25 students) as the control group. The assignment of intact classes ensured the natural learning environment of the school was preserved, while using the same teacher for both groups minimized instructional variation. To provide transparency on participant distribution, the table below presents the sample:

Table 1. *Research subjects*

Group	Class	Number of Students	Description
Experimental	VA	23	Received Google Sites-based media
Control	VB	25	Received conventional instruction

Ethical procedures were fulfilled prior to data collection, including obtaining institutional permission, securing parental consent, and ensuring confidentiality by anonymizing all student responses. A

needs analysis was performed through teacher interviews, student questionnaires, and curriculum analysis. Results indicated recurring challenges such as difficulty identifying main ideas, low baseline reading scores, and limited digital resources.

Table 2. *Summary of needs analysis*

Indicator	Finding	Source
Student difficulty	Inferential meaning & main idea	Teacher interview
Lack of media	No digital narrative text media	Document review
Student preference	87% prefer interactive media	Questionnaire
Baseline score	Mean = 54.3	Diagnostic test

A content and interface blueprint was created for the Google Sites platform. The media structure included introductory material, narrative text explanations, multimedia examples, interactive tasks, and integrated Google Forms assessments. The design focused on accessibility, cognitive load management, and child-friendly navigation.

The Google Sites media was developed and then validated by three experts in instructional design, Indonesian language education, and educational technology.

However, the biggest strength of this study is the empirical evidence from the quasi-experimental design. The significant difference in learning outcomes between the experimental and control groups confirms the effectiveness of digital media, as shown in studies such as Amelia et al. (2024), Nasim et al. (2024), and Mulyaningsih et al. (2023).

RESULTS AND DISCUSSION

Result of development product

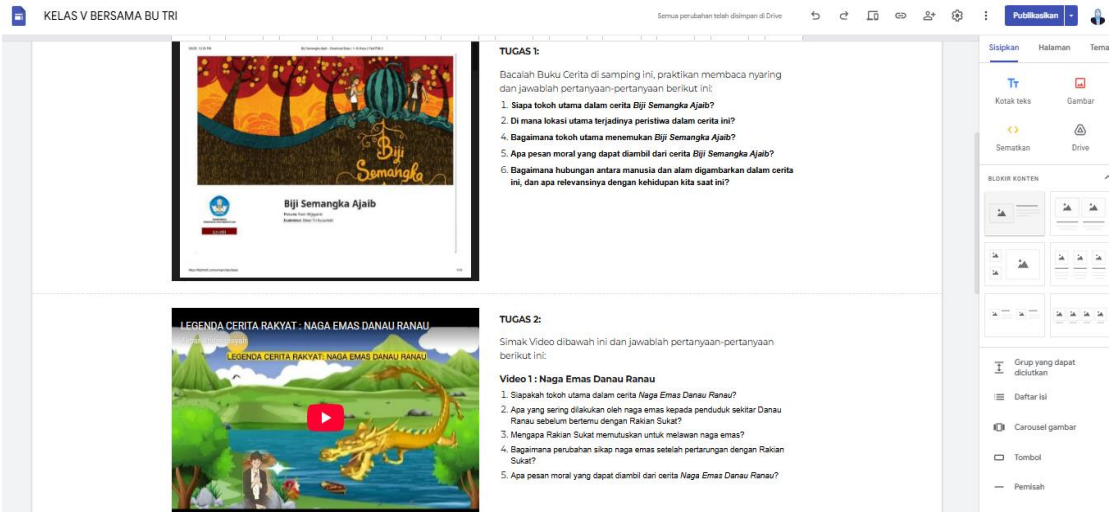


Figure 1. *Digital book display and educational videos*



Figure 2. *Menu buttons found in G-sites*

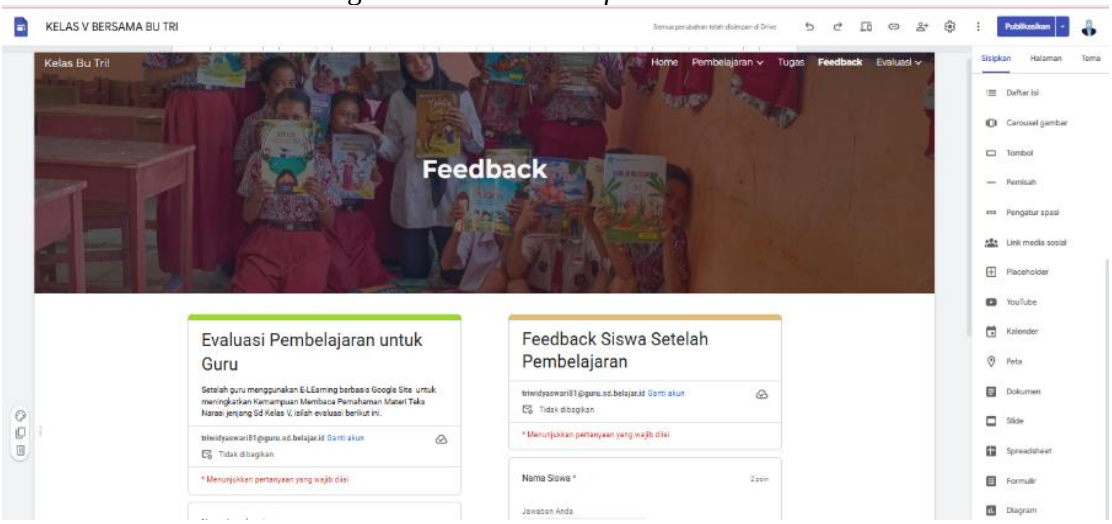


Figure 5. *Google Form feedback and evaluation display*

The initial design of the Google Sites-based e-learning media demonstrates that the product has been developed in line with the needs of reading comprehension instruction for narrative texts in 5th-grade elementary school students. The design features a systematic page structure, a simple yet informative user interface, and the integration of various learning elements such as reading materials, digital books, supporting videos, interactive exercises, and Google Form-based evaluations. The navigation menu is organized concisely to facilitate students' independent access to all sections of the content.

Overall, the initial design results indicate that the Google Sites-based e-learning media meets the fundamental principles of digital learning development: accessibility, appealing design, content integration, and the availability of feedback features. This product will next undergo validation by subject matter experts, media experts, and language experts to ensure its suitability, quality, and alignment with educational

standards before proceeding to practicality and effectiveness testing in the classroom.

Expert validation

An alpha test was conducted to evaluate the initial feasibility of the e-learning media before it was tested by users. This test involved subject matter experts, media experts, and language experts who provided feedback on the content's relevance, text clarity, graphic design quality, and the smooth functioning of navigation and multimedia features. Below is a summary of the expert validation results:

Table 3. *Expert validation summary*

No	Validation Test	Score Achieved	Maximum Score	Percentage	Category
1.	Media Expert	73	75	97.4%	Very Valid
2.	Content Expert	64	70	91.5%	Very Valid
3.	Language Expert	61	75	81.4%	Very Valid
	Average	66	73.33	90.1%	Very Valid

The validation results show that the Google Sites-based e-learning media falls into the "very valid" category with an average percentage of 90.1%. The media expert validation score of 97.4% indicates that the design, navigation, and feature integration are highly suitable for educational use. The content expert score of 91.5% shows that the material, its relevance to the competencies, and the presentation are aligned with the standards for narrative text comprehension learning. The language expert score of 81.4% suggests that the language used is appropriate, communicative, and suitable for elementary school students. Overall, the validation results from all three experts indicate that the product is ready to proceed to the practicality testing stage without major revisions.

Practicality testing

A beta test was conducted with a small group of 5th-grade students to assess the practicality, ease of use, and initial responses to the e-learning media. The results of this beta test serve as considerations for further product improvements before broader implementation. The testing was conducted in two stages: one-to-one testing and small group testing. Below is the summary of the practicality testing results:

Table 4. *Practicality testing summary*

Test	N-Student	Mean	Category
One to one test	3	80,7%	Practical
Small Group Test	9	84.11%	Very Practical
Total	12	82,40%	Very Practical

The practicality test was conducted in two stages: one-to-one and small group tests. The one-to-one test, involving 3 students, resulted in a mean practicality score of 80.7%, classified as practical. This indicates that the media was easily understood and used by students individually. In the small group test with 9 students, the practicality score increased to 84.11%, classified as very practical. This finding suggests that the media was even more effective when used in small group settings, with clearer flow and instructions followed without significant obstacles. Overall, the average practicality score of 82.40% across both stages categorizes the product as very practical. This confirms that the developed media has a high usability rate and is suitable for use in learning contexts, meeting clarity, ease of use, and appeal criteria.

Field test / effectiveness

The purpose of this test was to measure the effectiveness of the e-learning media in improving students' narrative text reading comprehension skills. The testing process involved pretest and posttest methods. Each test consisted of 15 questions. This stage utilized a quasi-experimental method, with both a control class and an experimental class. The difference in scores between the two tests would serve as the measure of the product's effectiveness. Below are the pretest results for the students:

Table 5. *Pretest results*

Class	Completed	Incomplete	N-Students	Average Score
Experimental	0	23	23	50.69
Control	0	25	25	44.44

The pretest results show that both classes had relatively low initial scores. In the experimental class, all 23 students were categorized as incomplete, with an average score of 50.69. The same situation occurred in the control class, where all 25 students failed to achieve completion, with an average score of 44.44. This indicates that the initial reading comprehension skills in both groups were at a basic level, making them suitable for comparison after the intervention.

Following the intervention, the experimental class was treated with the developed product, while the control class was not. After the learning process, the posttest results were as follows:

Table 6. *Posttest results*

Class	Completed	Incomplete	N-Students	Average Score
Experimental	23	0	23	88.70
Control	19	6	25	70.52

The posttest results indicate a significant improvement in the experimental class compared to the control class. In the experimental class, all 23 students achieved completion with an average score of 88.70. This indicates that the Google Sites-based learning media developed effectively enhanced the students' reading comprehension skills. In contrast, in the control class, only 19 out of 25 students achieved completion, while 6 students remained below the minimum competency level (KKM), with an average score of 70.52, significantly lower than the experimental class.

Overall, these findings confirm that the use of Google Sites-based learning media contributed positively to improving students' learning outcomes, particularly in reading comprehension of narrative texts, as evidenced by the high completion rates and average scores in the experimental class. To further support the findings and assess the effectiveness of the developed product, the N-Gain score was calculated:

Table 7. *N-Gain calculation*

Class	N	Mean Pretest	Mean Posttest	Std Dev Posttest	N-Gain	Category
Experimental	23	50.69	88.70	6.11	0.77	High
Control	25	44.44	70.52	6.51	0.47	Moderate

The N-Gain calculations show a significant difference in learning improvement between the experimental and control classes. The experimental class achieved an N-Gain of 0.77, categorized as high, indicating that the learning intervention was highly effective in improving students' comprehension. The control class achieved an N-Gain of 0.47, categorized as moderate, indicating that while there was some improvement, it was not as significant as in the experimental class.

In conclusion, these results suggest that the learning intervention in the experimental class was more successful in improving students' learning outcomes compared to the traditional learning methods in the control class. The noticeable difference in N-Gain categories further proves that the Google Sites-based media used in the experimental class contributed significantly to enhancing students' reading comprehension skills.

The findings of this study indicate that the Google Sites-based e-learning media developed significantly contributed to enhancing the reading comprehension skills of 5th-grade elementary school students in narrative text understanding. This result was obtained through stages of validation, practicality, and effectiveness, which demonstrated a high level of consistency between the product design and its successful implementation. Overall, this research emphasizes that the use of web-based digital media can serve as an adaptive learning strategy to meet the current needs of students.

The expert validation, with an average score of 90.1% in the "Very Valid" category, shows that the media meets pedagogical, linguistic, and visual design standards. These findings align with Dharmalau et al. (2021), who reported that interactive media achieved expert validation scores above 90%, making it highly suitable for

elementary education. Furthermore, other studies, such as Putri (2019), confirm that interactive multimedia use has proven effective in improving student learning outcomes, reinforcing that media with valid design and content can boost learning success.

The high media expert score of 97.4% in this study further supports the notion that clear navigation structures and informative layouts significantly enhance students' focus and comfort when interacting with digital learning materials. This is consistent with Djuwari et al. (2025), who also found that interaction design elements such as intuitive navigation, multimedia integration, and real-time feedback significantly improve student engagement and satisfaction in e-learning settings. Meanwhile, validation of content (91.5%) and language (81.4%) indicates that the content aligns with learning goals, competency standards, and the cognitive development levels of elementary school students. Therefore, the combination of high content validity and visual design, along with empirical evidence from the literature, provides a solid scientific foundation for continuing the product to the practicality and effectiveness testing stages without substantial revisions.

The beta test showed that the media was rated as "Very Practical" with an average score of 82.40%. This result demonstrates that the media is easy to use and comprehend by students, both individually and in small groups. The score increase from the one-to-one test (80.7%) to the small group test (84.11%) indicates that the media becomes more effective in collaborative settings, where students can support each other in navigating the learning content. This is consistent with findings in Luthfiyyah et al. (2021), who showed that technology-based collaborative strategies improve student interaction and engagement in small group learning. Furthermore, Irine et al. (2023) found that web-based e-learning, when designed with a user-friendly interface and easy access, consistently supports elementary school learning effectiveness, including ease of use and flexible access for both students and teachers. Additionally, studies by Aini (2025) emphasize that interface design and user experience (UX), specifically tailored for elementary students featuring simple layouts, intuitive navigation, and clear instructions significantly improve usability, making the media more understandable for young learners. Thus, the high practicality score further reinforces that the use of web platforms like Google Sites featuring clear navigation and straightforward instructions is relevant and suitable for the needs of elementary school students who require accessible, flexible, and comprehensible digital content.

The effectiveness of the media was demonstrated by the significant difference in posttest results between the experimental and control classes. The average posttest score in the experimental class was 88.70, much higher than the control class at 70.52. Furthermore, all students in the experimental class achieved mastery, while 6 students in the control class did not meet the minimum competency level (KKM). This difference underscores that the use of Google Sites-based media resulted in more optimal learning outcomes compared to traditional learning methods. Moreover, N-Gain analysis provided empirical evidence supporting this finding. The experimental class had an N-Gain score of 0.77 (high category), while the control class scored 0.47 (moderate category). This difference shows that the learning improvement in the experimental class was not only greater but also more evenly distributed, as seen from the lower standard deviation (6.11) compared to the control class (6.51). This indicates that the media effectively minimized the achievement gap among students, a common challenge in literacy education at the elementary school level.

The effectiveness of the web-based learning media in this study aligns with the constructivist view that learning becomes more meaningful when students interact directly with learning resources and independently build their understanding (Pertiwi & Arianto, 2023; Herdina & Ningrum, 2023; Mahesti et al., 2025). This study's findings are in line with Purwita and Zuhdi (2023), who demonstrated that Google Sites-based media allows students to engage in self-paced, flexible, and easily accessible learning, supporting active learning and multimodal engagement. Additionally, Hidayat et al. (2024) found that the use of multimodal digital storytelling and multimodal texts in language teaching significantly enhances reading comprehension and cognitive engagement, as it provides more cognitive traces for meaning construction. These findings reinforce the results of this study, which shows high N-Gain in the experimental class. Experimental web-based learning studies in the field of reading also report that web-based activities designed for self-directed learning and formative assessment (e.g., quizzes, automatic feedback) effectively enhance reading comprehension achievement when supported by clear navigation design and content suitable for

students' developmental levels (Sulistianingsih et al., 2021). This is consistent with the high validity and practicality observed in the development of Google Sites in this study.

Integrating very high validity, strong practicality, and significant learning effectiveness demonstrates that the development of Google Sites-based e-learning media has successfully met all aspects of good educational media quality according to instructional design standards (Pratama, 2021). Empirical findings show that the media is not only design-worthy but also effective in enhancing 5th-grade students' reading comprehension skills in narrative texts. Therefore, this study contributes significantly to showing that Google Sites can serve as a viable alternative platform for literacy education at the elementary school level, particularly in learning contexts that demand independence, accessibility, and integrated multimedia use.

CONCLUSION

This study demonstrates that Google Sites-based e-learning effectively enhances 5th-grade students' reading comprehension of narrative texts. The media was validated as highly effective in terms of content, design, and usability, with significant improvements in student learning outcomes. The findings confirm that web-based digital media, like Google Sites, is an excellent tool for fostering independent, engaging, and multimodal learning.

Future research could focus on expanding the sample size and exploring the long-term impact of Google Sites-based media on literacy skills. Additionally, customizing Google Sites for more interactive and personalized learning and integrating new technologies such as gamification and AI could further enhance its effectiveness. A comparative study with other digital learning platforms could also provide insights into the best tools for improving reading comprehension.

Although this study produced promising results, several limitations must be acknowledged. First, the research was conducted in only one elementary school, which may limit the generalizability of its findings. Future research should consider involving multiple schools with diverse student characteristics. Second, the intervention lasted for only four meetings; thus, it does not capture long-term retention or sustained learning outcomes. Longitudinal studies are recommended to examine whether improvements persist over time.

Third, the instructional process relied on a single teacher for both groups, which, while controlling some variables, may still introduce teacher-related biases. Future studies could assign multiple teachers to evaluate consistency across instructional practices. Finally, the study focused primarily on quantitative data. Incorporating qualitative data, such as interviews or student learning artifacts, could offer deeper insights into the cognitive processes and strategies students use while engaging with digital literacy media.

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