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Development of Indonesian Language Digital Literacy E-Module and Its Effectiveness In Improving Reading Comprehension Skills Of Fifth Grade Students at SD Negeri 3 Randulawang

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ABSTRAK

Kajian ini berfokus pada perancangan dan pengujian tingkat keefektifan sebuah e-modul literasi digital Bahasa Indonesia yang diperuntukkan bagi peserta didik kelas V Sekolah Dasar. Pendekatan yang diterapkan adalah Penelitian dan Pengembangan (Research and Development/R&D) dengan mengadopsi kerangka model ADDIE yang meliputi tahapan Analisis (Analysis), Perancangan (Design), Pengembangan (Development), Penerapan (Implementation), serta Penilaian (Evaluation). Fase awal analisis dilaksanakan melalui pengkajian kebutuhan yang melibatkan dua orang guru dan dua puluh siswa di SD Negeri 3 Randulawang. Produk akhir yang dihasilkan adalah sebuah e-modul interaktif berbasis platform Canva yang memadukan secara utuh konten pemahaman bacaan, aktivitas penulisan kreatif, serta tugas-tugas literasi digital dasar. Pengujian keefektifan produk menggunakan desain one-group pretest-posttest. Pengumpulan data primer dilakukan dengan instrumen tes literasi yang telah terlebih dahulu melalui proses validasi ahli. Analisis statistik dengan uji paired sample t-test membuktikan terjadinya peningkatan yang signifikan ($t(19) = 6.72$, $p < 0.001$), didukung oleh perolehan nilai N-Gain rata-rata sebesar 0.52 yang termasuk dalam kategori peningkatan sedang. Temuan ini mengonfirmasi bahwa e-modul yang dirancang terbukti efektif dalam mengembangkan kompetensi literasi siswa. Simpulan penelitian menegaskan bahwa integrasi elemen teknologi ke dalam bahan ajar literasi yang dirancang secara kontekstual mampu menjadi alternatif inovatif untuk memperkuat Gerakan Literasi Sekolah (GLS). Sebagai tindak lanjut, disarankan untuk melakukan uji coba dengan cakupan lebih luas menggunakan desain kelompok kontrol serta pengembangan konten pada dimensi literasi digital lainnya.

Kata Kunci: e-modul; literasi digital; membaca pemahaman; penelitian pengembangan; sekolah dasar.

ABSTRACT

This study focuses on the design and testing of the effectiveness level of an Indonesian language digital literacy e-module intended for fifth-grade elementary school students. The approach applied is Research and Development (R&D) by adopting the ADDIE model framework, which includes the stages of Analysis, Design, Development, Implementation, and Evaluation. The initial analysis phase was carried out through a needs assessment involving two teachers and twenty students at SD Negeri 3 Randulawang. The final product produced is an interactive e-module based on the Canva platform that comprehensively integrates reading comprehension content, creative writing activities, and basic digital literacy tasks. Product effectiveness testing used a one-group pretest-posttest design. Primary data collection was conducted using a literacy test instrument that had previously undergone expert validation. Statistical analysis with the paired sample t-test proved a significant increase ($t(19) = 6.72$, $p < 0.001$), supported by an average N-Gain score of 0.52, which falls into the medium improvement category. These findings confirm that the

designed e-module is effective in developing students' literacy competencies. The research conclusion affirms that integrating technological elements into contextually designed literacy teaching materials can be an innovative alternative to strengthen the School Literacy Movement (GLS). As a follow-up, it is recommended to conduct trials with a broader scope using a control group design and to develop content in other dimensions of digital literacy.

Keywords: e-module; digital literacy; reading comprehension; development research; elementary school.

INTRODUCTION

The technological dynamics of the 21st century necessitate a renewal of meaning regarding the essence of literacy. This skill has now transcended mere technical proficiency in reading and writing (read-write literacy), transforming into a competency to interpret, utilize, critique, and reflect on various information presented in diverse complex formats and contexts (OECD, 2018). This evolution positions literacy as an essential foundation for every individual to participate fully in a knowledge-based society. Addressing this global challenge, the Government of Indonesia, through the Ministry of Education, Culture, Research, and Technology, launched the School Literacy Movement (GLS). This strategic policy is intended to foster a sustainable literacy culture, beginning at the most basic level of education.

Although it has become a national policy, the implementation of GLS in the field, particularly at the elementary school (SD) level, still encounters tangible obstacles. One of the main causes is limited access to teaching materials that simultaneously meet three criteria: contextual, engaging, and aligned with the characteristics of digital native learners who are highly familiar with technological devices and environments (Kurnianingsih et al., 2017). In response, various efforts to develop literacy teaching materials have been undertaken. The emerging innovations are diverse, ranging from printed thematic modules incorporating local wisdom values (Sari & Mulyati, 2020), Student Worksheets (LKPD) with special designs to hone core literacy skills (Wulandari, 2021), to basic e-modules leveraging the convenience of digital platforms (Dewi & Santosa, 2022).

A recent study by Maghfirah and Jasiah (2024) highlights the significant potential of visual design platforms like Canva in creating interactive digital modules. However, a review of existing products indicates a research gap: most of these teaching materials have not holistically and systematically integrated key digital literacy components. These components include skills for critically and safely searching and selecting information, applying digital media ethics (digital citizenship), and the ability to produce simple content into the main learning flow of subjects, especially Indonesian Language. As a result, literacy learning often remains fragmented and has not fully succeeded in bridging the gap between traditional literacy skills and competency demands in the digital age.

Findings from an initial needs study at several elementary schools, including SD Negeri 3 Randulawang in Blora, further reinforce this condition. The literacy teaching materials commonly used are still conventional, dominated by linear text presentation, and lack space for interactivity and active student engagement. Cognitively, fifth-grade students are in a transitional period towards the end of the concrete operational stage, which allows them to begin thinking more abstractly and logically. At this stage, they require learning stimuli rich in visual elements, interactive, and offering meaningful tasks relevant to their daily lives. Therefore, this research is presented with a specific focus: developing an e-module for digital literacy in Indonesian Language learning.

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This e-module is designed not only to strengthen reading comprehension skills as a foundation but also to train students in an integrated manner to be able to produce (creating) and interact ethically (ethically) in digital spaces. Building on the outlined background, this research is formulated with two main objectives. First, to produce a prototype Indonesian language digital literacy e-module declared feasible based on assessments by content and media experts. Second, to test the level of effectiveness of this e-module in improving the reading comprehension skills of fifth-grade elementary school students. In detail, the research questions to be answered are: (1) What are the characteristics of a valid and practical Indonesian language digital literacy e-module according to expert assessment? (2) Is there a significant improvement in the reading comprehension skills of fifth-grade students after the implementation of the digital literacy e-module.

METHOD

This study employed the Research and Development (R&D) method, which is oriented towards creating a product and testing its effectiveness. The development framework followed the ADDIE model, a structured process comprising five systematic stages: Analysis, Design, Development, Implementation, and Evaluation. The research was conducted at SD Negeri 3 Randulawang, Blora, selected based on its representation of an elementary school in a regional area where instructional practices can accommodate gradual technology integration. The primary research subjects included the entire population of fifth-grade students, totaling 20 individuals. A saturated sampling technique was used due to the population's limited size and homogeneity, meaning all members were included as participants. In addition to the students, two fifth-grade teachers were involved as supporting participants, particularly during the needs analysis and formative product evaluation stages.

Data collection was carried out using five main instruments tailored to the objectives of each phase. The first instrument was a needs analysis questionnaire distributed to teachers and students to identify specific issues and requirements related to the literacy teaching materials previously used. The second instrument was a literacy assessment tool in the form of multiple-choice and short-essay questions, which functioned as pretest and posttest measures. This tool evaluated three indicators of reading comprehension ability: locating explicit information, inferring implicit meaning, and critically evaluating text content. The content validity of this instrument was confirmed by two experts, while a reliability test using Cronbach's Alpha formula yielded a coefficient of 0.81, indicating a high level of consistency. The third instrument was an expert validation sheet used to assess the feasibility of the e-module in terms of content substance, media design, and language use.

The fourth instrument was an observation sheet, which served to document the learning implementation process during the product trial. The fifth instrument was a student response questionnaire, aiming to measure the level of appeal and practicality of the e-module from the end-user perspective. The research procedure adhered sequentially to the phases of the ADDIE model. In the Analysis phase, a needs study was conducted through questionnaire distribution and brief interviews with teachers, alongside an in-depth review of curriculum documents to identify relevant Core Competencies (Kompetensi Inti / KI) and Basic Competencies (Kompetensi Dasar / KD). The Design phase involved activities such as compiling a content map, formulating operational learning objectives, creating a storyboard or visual flow for the e-module, and planning evaluation instruments.

The Development phase was the process of transforming the design into a functional product. The e-module was constructed using the Canva platform for interface and visual content design, which was then packaged in the form of a simple website for online access.

The initial prototype (prototype) was then assessed by a content expert (a lecturer in Indonesian Language Education) and a media expert (a lecturer in Educational Technology) to obtain feedback for improvement. After undergoing a revision cycle based on validator recommendations, the product entered the Implementation phase. In this stage, the e-module was trialed with 20 fifth-grade students. The trial was conducted over four sessions within a two-week period. The first session was allocated for the pretest administration.

The following two sessions focused on the learning process using the e-module, facilitated and guided by the teacher. The fourth session was used to conduct the posttest and administer the student response questionnaire. The Evaluation phase occurred formatively at the end of each phase for ongoing refinement purposes, and summarively at the end of the research to measure the achievement of the research objectives. Quantitative data from the pretest and posttest results were processed using descriptive statistical analysis to illustrate data trends, and inferential analysis using the paired sample t-test to examine the significance of score differences. The magnitude of improvement was also quantified using the Normalized Gain (N-Gain) formula. Meanwhile, qualitative data from the questionnaires, observations, and validation sheets were analyzed through descriptive qualitative analysis by grouping and interpreting responses to gain an in-depth understanding of the product's quality and its level of acceptance in the learning context.

RESULTS

Product Development Results

The validation results from content and media experts indicated that the developed digital literacy e-module achieved an average score of 4.3 on a scale of 1 to 5. According to standard feasibility categories, this score falls under the "Very Feasible" classification, making it suitable for pilot testing in instructional settings. Several substantive refinements were implemented in response to constructive feedback from the validators. Key recommendations included inserting a more detailed user guide in the introductory section of the module, refining assessment rubrics for digital literacy project tasks to enhance objectivity and measurability, and adjusting the difficulty level of practice questions in specific units to better align with the cognitive stage of fifth-grade students.

The final product is a digital literacy e-module entitled "Jelajah Literasi Digital" (Digital Literacy Exploration), accessible online. The e-module is organized into three thematically connected learning units: (1) Exploring Information in Digital Texts, which focuses on scanning skills and locating specific information; (2) Summarizing and Reflecting on Readings, designed to sharpen inference-making abilities and connect texts with personal experience; and (3) Creating Simple Digital Book Reviews, which encourages students to become active contributors by producing content in the form of digital posters or short videos.

Effectiveness Test Results

To assess the impact of the developed e-module, the collected pretest and posttest data from the 20 respondents were subsequently analyzed. Descriptive analysis of the data indicates an upward trend in the average literacy scores of the participants from before to after the intervention was administered. A detailed breakdown of these descriptive statistical findings is presented in Table 1.

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Tabel 1. Comparison of Average Pretest and Posttest Scores of Reading Comprehension Skills

Measurement	Average Score (Mean)	Standard Deviation (SD)	Minimum Value	Maximum Value
Pretest	62,5	7,8	50	75
Posttest	80,4	6,1	70	92

Prior to conducting hypothesis testing, a prerequisite analysis in the form of a normality test on the gain or difference scores (posttest minus pretest) was performed. The Shapiro-Wilk test yielded a significance value of 0.112 ($p > 0.05$), indicating that the difference data is normally distributed and thus meets the assumption for proceeding with parametric testing. Subsequently, a paired sample t-test was conducted to examine the significance of the observed improvement. The calculation results showed a t-value of 6.72 with degrees of freedom (df) = 19 and a significance value (p) = 0.000 ($p < 0.001$).

This result confirms a statistically highly significant difference between the pretest and posttest scores, with posttest scores being, on average, superior. To quantify the magnitude of this improvement, the Normalized Gain (N-Gain) score was calculated. This calculation produced an average N-Gain of 0.52. According to commonly used interpretation criteria, an N-Gain value within the range of $0.3 \leq g < 0.7$ is classified as a "medium improvement." Therefore, it can be concluded that the implementation of the digital literacy e-module provides a significant and fairly substantial enhancement effect on students' reading comprehension skills.

Discussion

The statistically significant improvement in literacy scores validates the effectiveness of the "Jelajah Literasi Digital" e-module in enhancing students' reading comprehension. This positive outcome aligns with previous research, such as the findings by Wardana et al. (2022), which demonstrated that application-based learning media can serve as an effective catalyst for strengthening foundational literacy competencies. The distinctive value of this e-module lies in its coherent and systematic fusion of conventional reading tasks like locating explicit information and drawing conclusions with essential digital literacy practices, including digital citizenship and basic content creation.

This synthesis transforms the student's role from a passive information consumer into an active and responsible content producer an orientation central to the goals of digital literacy (Reyna et al., 2018). Furthermore, the high degree of interactivity and rich visual elements embedded in the e-module, such as short instructional videos, drag-and-drop quizzes, and a digital gallery for showcasing work, are posited as key drivers behind the observed increase in students' intrinsic motivation and engagement during lessons. This phenomenon finds theoretical support in the Cognitive Theory of Multimedia Learning (Mayer, 2009), which posits that presenting information through well-integrated dual channels (verbal and visual) can reduce cognitive load and foster deeper understanding and memory retention.

Observations during the implementation phase also revealed practical challenges to consider. The first was a dependence on internet connectivity, which was not consistently stable at the research site and could potentially disrupt access. Second, there was variation in students' initial proficiency with operating digital devices for learning purposes. Consequently, for broader and more sustainable application, a structured strategy for technical support for students and the provision of an offline usage option via a

downloadable core module are recommended. This finding also offers a valuable practical contribution for educators, as the e-module presents a concrete model for differentiated literacy instruction. It allows students with varying learning paces to interact with the material in a more personalized manner. In essence, this development product resonates with the ethos of the Merdeka Curriculum, which champions emancipatory, student-centered, and project-based learning, while simultaneously addressing contemporary literacy challenges.

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CONCLUSION

Based on the complete research process and data analysis conducted, several key conclusions can be drawn. First, this study successfully developed a product in the form of an Indonesian language digital literacy e-module titled "Jelajah Literasi Digital" for fifth-grade elementary school students. After a revision process, the e-module was rated as "Very Feasible" by expert validators in the aspects of content, media, and language use. Second, the developed e-module proved effective in improving students' reading comprehension skills. This effectiveness is statistically demonstrated by the paired sample t-test, which showed a significant score increase ($p < 0.001$), supported by an average N-Gain score of 0.52, categorized as a medium level of improvement.

The implications of these findings underscore the urgency of integrating digital literacy components in a structured and systematic manner into core teaching materials, particularly for the Indonesian Language subject from the basic education level onward. This e-module product offers a concrete model that can be adopted, adapted, and further developed by teachers in daily instructional practice to support the implementation of a School Literacy Movement (GLS) more relevant to the digital era.

For future development, this study offers several recommendations. For other researchers, it is advised to test the product's effectiveness with a more rigorous experimental design, such as a pretest-posttest control group design, involving a larger and more diverse sample to strengthen the generalizability of the findings. Furthermore, the development of similar teaching materials could be expanded by integrating other literacy aspects, such as data literacy and digital numeracy, to equip learners with more comprehensive literacy competencies. For schools and educational authorities, these findings can serve as a consideration to provide training and mentoring for teachers in developing and utilizing literacy-based digital teaching materials, as well as to prepare adequate supporting infrastructure.

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