COOPERATIVE- BASED DIGITAL COMIC MEDIA DEVELOPMENT INTEGRATED READING COMPOSITION TO IMPROVE ELEMENTARY SCHOOL STUDENTS' READING COMPREHENSION SKILLS

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Abstract: *Reading comprehension instruction in elementary schools is often delivered verbally and abstractly without the support of engaging visual media. Fourth-grade students show difficulty in understanding the content of reading material, determining moral messages, and summarizing the content. This study aims to develop a valid, practical, and effective digital comic media based on Cooperative Integrated Reading and Composition (CIRC) to improve the reading comprehension skills of fourth-grade elementary school students. This study uses the Research Method. and Development with the 4D model (Define, Design, Develop, Disseminate). The research subjects involved fourth-grade students at SDIT Iskandar Muda, Bekasi. Data collection was conducted through observation, interviews, validation questionnaires from material and media experts, and reading comprehension skills tests before and after the intervention. Validation data were analyzed qualitatively descriptively, while test data were analyzed quantitatively using statistical tests. CIRC-based digital comic media met the valid criteria with high average scores in the aspects of material suitability, language clarity, visual appeal, and ease of use. Limited trials showed this media was practical and received positive responses from students and teachers. The test results showed a significant increase in students' ability to answer reading questions, determine moral messages, and summarize the contents of the reading. The integration of digital comic visualization with the CIRC cooperative approach created an active and collaborative learning environment that effectively improved reading comprehension. This research was limited to fourth-grade students in one school and requires the availability of digital infrastructure and teacher competence in technology. This study recommends the use of CIRC-based digital comic media as an innovative alternative in teaching reading comprehension and suggests further research at higher grade levels and in online learning contexts.*

Keywords: *digital comics, CIRC, reading comprehension skills, learning media, elementary schools.*

Introduction

The development of digital technology in education has shifted the paradigm of conventional learning towards a more interactive and engaging one. In the context of primary education, the use of appropriate learning media can be a key aspect of the success of the teaching and learning process, particularly in enhancing students' literacy skills. Reading and writing skills, as the foundation of learning in primary schools, require an innovative approach that aligns with the characteristics of students aged 6-12, who tend to prefer visualization and

engaging interactions (Marliana, 2023). Education needs further exploration of the use of technology in its learning system to adapt to current conditions and ensure its acceptance by the public.

Based on observations conducted in fourth grade, several problems were identified by both teachers and students. First, there was a lack of contextual, visual, and engaging learning media that could convey reading material in a concrete and age-appropriate manner . Material on reading comprehension skills was often presented verbally and abstractly, without the support of visualization or emotional and reflective student engagement. Second, students' lack of reading comprehension skills was characterized by their inability to accurately answer questions related to the content of the reading, their inability to identify the moral message contained in a story, and their inability to summarize the content of the reading.(Brilliananda, 2020).

To address these issues, it is necessary to develop innovative, engaging learning media that are appropriate to the characteristics of elementary school students. These media are visual, contextual, and can stimulate curiosity. The proposed solution is to develop digital comics in learning. Digital comics, as a learning medium, have great potential to increase students' interest in reading and comprehension of texts. Through a combination of images, text, and contextual storylines, digital comics can help students understand the content of reading more easily due to the support of visual elements that facilitate interpretation of meaning. Furthermore, researchers recommend the use of the Cooperative Learning model. Integrated Reading and Composition (CIRC) in addressing the identified problems. The CIRC learning model plays a crucial role in developing reading comprehension skills through collaborative steps such as pair reading, discussing the content of the reading, and rewriting the results of the comprehension, thus training students to think critically and understand the context of the text in depth.

The purpose of this study is to produce a valid, practical, and effective digital comic-based learning media product to improve the reading comprehension skills of fourth-grade elementary school students. Specifically, this study aims to analyze and identify the needs of teachers and fourth-grade elementary school students related to reading comprehension learning media, compile an initial design of CIRC-based digital comic media that is suitable for use, produce a product that meets the valid criteria based on the assessment of material experts and media experts, is practical based on the results of limited trials in the classroom, and is effective based on the improvement of students' reading comprehension skills after using the media, and disseminate CIRC-based digital comic media products so that they can be adopted and utilized by other teachers in the learning process.

Literature Review

The samples were taken by using a purposive sampling technique. In collecting data, the researcher used pre-test given before the treatment and the post-test after the treatment. Both tests were multiple choice tests used to findout the students’ability in reading comprehension of narrative texts. The researcher analyzed the data by using normality test, homogeneity test and t-test by using Man Whitney test with SPSS version 23.0. The result of the research showed that the Sig (2-tailed) value was 0.045. So, the alternative hypothesis was accepted while the null hypothesis was rejected. It means that there is a significant different ability of reading comprehension of narrative texts between the students taught by using digital comics and taught without using digital comics. (Fitri & Aerosa Hasibuan, 2023).

The results showed that the comic media was feasible with an average percentage of 81.7% from the experts in the appropriate category. The average student responses indicated that students were happy to read comics as a learning medium in the learning process with a percentage of 95%. Based on the pretest and the posttest results, the developed comic media had

increased the learning outcomes of fifth graders at the Elementary School of 22 Palembang by 0.42 with a moderate improvement category according to the N-Gain scale. (Murniviyanti & Marini, 2021).

The digital comic achieved a validity score of 95.4% (very valid), a teacher practicality score of 90.83%, and a student practicality score of 92.2% (both very practical). Its effectiveness resulted in an N-Gain Score of 0.8052 (high) and an N-Gain percentage of 80.52% (effective). (Utami et al., 2025).

The method used in this study is classroom action research (PTK) which is carried out in three cycles, where each cycle consists of planning, action, observation, and reflection. Data was collected through observation, student worksheets (LKS), and reading comprehension tests. The results show that the application of the CIRC model significantly improves students' reading comprehension skills. In the first cycle, the average score of students' reading comprehension was 67.27, with 70% of students achieving a score above the Minimum Completeness Criteria (KKM). In the second cycle, the average score increased to 77.76, with 80% of students achieving scores above the KKM. In the third cycle, the average score reached 83.2, and 90% of students successfully met the KKM. (Chandra Muji Utami & Nurhasanah, 2025)

The results showed that most students experienced a significant improvement in reading ability, with varying comprehension categories, some students showed good comprehension, while others still needed further guidance in certain aspects such as summarizing and grasping reading mandates. The conclusion of this study is that the application of the CIRC model has proven to be effective in improving students' reading comprehension skills, although there are still challenges that need to be overcome to achieve optimal results. (Nuryani, 2024).

Method

This research uses research and development methods (Research and Development) by adopting the 4D development model developed by Thiagarajan, Semmel, and Semmel. The 4D model consists of four main stages: Define, Design, Develop, and Disseminate. This model was chosen because its steps are simple yet systematic and allow researchers to make continuous revisions based on validation and field-testing results, so that the resulting product is truly feasible to implement.

This research was conducted at the Iskandar Muda Integrated Islamic Elementary School (SDIT), located on Jalan Kampung Gabus Bulak RT 02/03, Sriamur Village, Tambun Utara District, Bekasi Regency, West Java. The selection of this location was based on considerations of the availability of digital technology facilities, teacher readiness in implementing digital comic-based learning media, and ease of access for researchers in conducting observations and media trials. The research subjects involved fourth-grade elementary school students as the main respondents in the use of CIRC-based digital comic media, while teachers acted as facilitators and observers in media implementation.

Define stage is carried out to identify learning needs and problems through observation, interviews with teachers, and analysis of student characteristics and the curriculum. The design stage focuses on developing a learning solution plan based on the results of the needs analysis, including the design of a digital comic media prototype that integrates the steps of the CIRC learning model. The develop stage includes the process of creating an initial product, validation by material experts and media experts, and limited trials to evaluate the product's practicality and effectiveness. Validation is carried out to ensure that the developed media has a strong theoretical basis and is in accordance with learning needs. After validation, revisions are made based on input from experts. Meanwhile, the disseminate stage is the process of disseminating products that have been proven valid, practical, and effective into broader learning contexts.

Data collection techniques in this study include observation to identify learning problems, interviews with teachers and students to explore the need for learning media, validation questionnaires for material experts and media experts, teacher and student response questionnaires to assess the practicality of the media, and reading comprehension skills tests to measure the effectiveness of the media before and after use. Data obtained from expert validation were analyzed descriptively qualitatively to determine the level of media feasibility, while data from reading comprehension skills tests were analyzed quantitatively using statistical tests to see the improvement in student learning outcomes after using CIRC-based digital comic media.

Result and Discussion

Based on the 4D model development stages, this study produced several important findings indicating that CIRC-based digital comic media is feasible and effective for use in learning reading comprehension for fourth-grade elementary school students. At the define stage, the results of the needs analysis showed that teachers require contextual, visual, and engaging learning media to improve students' reading comprehension skills. Observations in fourth grade showed that most students had difficulty understanding the content of the reading, determining the moral message of the story, and summarizing the content of the reading. Students also tend to be more interested in visual and interactive learning media compared to conventional methods that are verbal and abstract.

In the design stage, a digital comic media prototype was designed that integrates the steps of the CIRC learning model. The initial media design was compiled based on the results of the student needs analysis and the fourth grade Indonesian Language curriculum. The digital comic is designed in the form of a simple application or interactive file that can be accessed via computers and gadgets. The stories in the comic contain learning themes in accordance with the Basic Competencies of the Indonesian Language, such as understanding narrative and descriptive texts. The comic is equipped with interactive features such as pop- up text, short quizzes, and collaborative activities that support the stages of the CIRC model. Each story episode ends with reflective questions and group assignments that lead students to integrated reading and writing activities.

In the development stage, the initial digital comic media product was validated by material experts and media experts. The validation results showed that the CIRC-based digital comic media met the valid criteria with a high average score in terms of material suitability to the curriculum, language clarity, visual appeal, and ease of use. The experts provided several suggestions for improvements related to the comic panel layout, color usage, and adjustment of the language difficulty level to suit the reading abilities of fourth-grade students. After revisions based on expert input, the digital comic media was then tested on a limited basis on a group of fourth-grade students.(Muttalib, 2024)

The results of a limited trial showed that CIRC-based digital comic media was considered practical and easy to use by students and teachers. Students responded positively to the comic's visual appearance, engaging storyline, and collaborative group activities that made them more active in understanding the reading content. Teachers also reported that using this media made it easier for them to deliver reading comprehension materials and increased student participation during learning (Amaliyah, 2024). In addition, the results of the reading comprehension skills test showed a significant increase in students' abilities to answer questions related to the reading content, determine the moral message of the story, and summarize the reading content after using CIRC-based digital comic media.(Wibowo, 2024)

The integration of digital comic media with the CIRC learning model has proven effective in improving students' reading comprehension skills. The combination of attractive visualizations in digital comics and the cooperative learning approach in the CIRC model creates an active, collaborative, and enjoyable learning environment. Visual media in digital comics makes it easier for students to understand the context of the reading and improves memory retention, while the CIRC model organizes learning strategies so that students actively process information through discussion and collaboration in groups (Putri, 2024). Reading in pairs, discussing the content of the story, and rewriting the results of their understanding help students develop critical and analytical thinking skills regarding the text they read.

The findings of this study are in line with previous research showing that the use of digital comics can increase students' interest in reading and comprehension of texts. Research by Sari (2023)shows that the application of digital comic media in Indonesian language learning can improve the ability to understand the content of reading in fourth grade elementary school students. Similarly, research by Syahfitti (2025)found a significant difference between the group using digital comics and the control group in terms of reading comprehension. Meanwhile, the application of the CIRC model has also been proven effective in various studies. Wulandari (2025)found that the CIRC model can improve Indonesian language learning outcomes, especially reading comprehension skills through collaboration in small groups.

The advantage of CIRC-based digital comic media lies in its ability to combine the power of visual media with collaborative learning strategies. Digital comic media not only functions as entertainment, but also as an educational medium that is able to integrate text and image elements to improve students' reading comprehension skills (Lestari, 2024). Visualizations in digital comics help students interpret the meaning of the text more concretely, while collaborative activities in the CIRC model train students to think critically, communicate, and work together in groups. Thus, the integration of these two elements creates a meaningful and immersive learning experience for elementary school students.(Sukoco, 2025).

However, there are several weaknesses that need to be considered in implementing CIRC-based digital comic media. First, the use of this media requires the availability of technological devices and adequate internet access, which may be a challenge in schools with limited digital infrastructure. Second, teachers need to have basic skills in operating digital technology and managing interactive media-based learning for effective implementation. Third, developing digital comic media requires time, expertise in graphic design, and sufficient resources. Therefore, training for teachers and support from schools in providing the necessary facilities for optimal implementation of this media are necessary.

Conclusion

This research has succeeded in developing digital comic media based on Cooperative Integrated Reading and Composition (CIRC) is valid, practical, and effective for improving the reading comprehension skills of fourth-grade elementary school students. The validation results of material experts and media experts show that the developed media meets the eligibility criteria with high scores in the aspects of material suitability, language clarity, visual appeal, and ease of use. Limited trials show that this media is practical and easy to use by students and teachers, and received positive responses from both parties. The results of the reading comprehension skills test showed a significant increase in students' abilities to understand the content of the reading, determine the moral message of the story, and summarize the content of the reading after using CIRC-based digital comic media.

The integration of digital comics with the CIRC learning model has proven effective in creating an active, collaborative, and enjoyable learning environment. The engaging visualizations in digital comics help students understand the context of the reading more concretely, while the cooperative learning approach in the CIRC model trains students to think critically, communicate, and collaborate in groups. Thus, this medium not only improves students' reading comprehension skills but also develops social skills and critical thinking skills, which are essential for 21st-century learning.

Based on the results of this study, it is recommended that elementary school teachers utilize CIRC-based digital comics as an alternative, innovative learning medium to improve students' reading comprehension skills. Schools need to provide adequate technological facilities and provide training to teachers so that the implementation of this media can run optimally. For further research, it is recommended to develop CIRC-based digital comics for different learning materials and at higher grade levels and conduct long-term research to determine the impact of using this media on improving student literacy in a sustainable manner. In addition, further research is needed to evaluate the effectiveness of this media in the context of online learning and hybrid learning.

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