

INNOVATION IN LEARNING MEDIA: THE EFFECTIVENESS OF INTERACTIVE DIGITAL COMICS ON THE SPEAKING SKILLS OF FIFTH-GRADE ELEMENTARY SCHOOL STUDENTS

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Abstract: English speaking skills are one of the most important competencies in the era of globalization. These skills need to be developed from an early age, as this is when humans are in their golden age. The use of media that is interesting and appropriate for elementary school students is one of the key factors in achieving this goal. This research aims to develop an innovative learning medium in the form of an interactive digital comic application (educational courseware) and test its effectiveness in improving the speaking skills of fifth-grade elementary school students. The study employs a Research and Development (R&D) methodology based on the Borg and Gall model, which focuses on product design, validation, field testing, and refinement. The developed medium integrates visual and audio features tailored to young learners, including a “Read to Me” function that allows students to listen and imitate pronunciation directly. The effectiveness of the media was tested through a pretest–posttest design, and the results were analyzed using the N-Gain method. The research findings showed an N-Gain value of 0.87, which falls into the “high” category, indicating that the interactive digital comic application is highly effective in improving students’ speaking skills. This study highlights that incorporating interactive and visual-based educational courseware into language instruction can significantly enhance learners’ engagement and speaking performance.

Keywords: Speaking Skill, Speaking Strategy, Young learners, Elementary School, Comic.

1. INTRODUCTION

English serves as an international language that plays a vital role in various aspects of life, including education, economy, social interaction, and technology. Consequently, English proficiency has become an essential skill that should be developed from an early age. According to the latest EF English Proficiency Index [1], Indonesia ranks 80th out of 116 countries with a score of 468, and 12th among 23 Asian countries. These figures indicate that Indonesians’ English proficiency remains relatively low compared to neighboring nations, highlighting the urgency to improve English learning, particularly among young learners.

Speaking ability, as one of the core components of language competence, is crucial for success in the global era. Previous studies [2][3] emphasize that graduates with adequate English communication skills tend to have better employment opportunities, as many companies now consider oral fluency a fundamental requirement. Therefore, strengthening speaking skills at an early stage can significantly contribute to learners’ future academic and professional development.

Children in elementary school are in their golden age of cognitive and linguistic growth, making it an optimal period for acquiring a foreign language. Research shows that language learning introduced early tends to yield better results because young learners can absorb and reproduce new sounds more naturally [4][5]. However, in Indonesia, learning English as a foreign language remains challenging due to differences in pronunciation and writing systems [6].

Digital learning media have emerged as an effective solution to enhance learning engagement. Studies have shown that digital-based learning offers flexibility, practicality, and accessibility [7]. Nevertheless, most available digital media still emphasize receptive skills such as reading and listening, while productive skills like speaking remain underexplored. Integrating interactive elements, visuals, and audio can foster a more natural and contextual learning environment, helping students practice language use with confidence. As noted by Zhao et al. [8], limited opportunities to practice English often lead students to feel anxious and lack confidence in real communication.

In response to these challenges, this study aims to design and evaluate an **interactive digital comic application** that enhances fifth-grade students' English-speaking skills. The medium combines text, animation, and audio narration within contextual stories that align with children's daily experiences. According to Suprpto et al. [9], digital comics can effectively convey educational content by integrating visual storytelling and interactivity, thus making learning more engaging and student-centered. This innovation is grounded in constructivist learning theory, which emphasizes that knowledge is built through active participation and meaningful interaction.

2. METHODOLOGY

This study employed a Research and Development (R&D) approach based on the Borg and Gall (1983) model, which focuses on developing and validating educational products. The model originally consists of ten stages, but in this research, it was simplified into seven steps: (1) research and data collection, (2) planning, (3) product draft development, (4) design validation, (5) design improvement, (6) field testing, and (7) final product refinement.

The study was conducted at a public elementary school in Tasikmalaya Regency, West Java, Indonesia, involving 21 fifth-grade students. The research was carried out between January and May 2025.

3.1 Research and Data Collection

The initial stage involved a needs analysis to identify challenges in English-speaking instruction. Data were collected through classroom observations, teacher interviews, and student questionnaires.

- **Observation Procedure:**

Observations were conducted over four sessions, each lasting approximately 45 minutes during regular English classes. The researchers focused on several behavioral aspects, including students' engagement, participation, pronunciation practice, vocabulary use, and confidence in speaking English. Data were recorded using structured observation sheets and later summarized into qualitative notes. The information was analyzed to identify recurring difficulties and determine appropriate design features for the digital comic.

- **Teacher and Student Interviews:**

Structured interviews were conducted with two English teachers and five students to gain insights into current teaching methods, learning materials, and students' motivation in learning speaking skills.

3.2 Planning and Product Development

Based on the needs analysis, an **interactive digital comic application** was designed. The comic included topics relevant to daily life, such as "Parts of the Body," and incorporated interactive features like "Read to Me" audio buttons, simple dialogues, and pronunciation guides.

3.3. Validation and Instrumentation

To ensure content validity, three categories of experts were involved in the validation stage:

- **Media Expert:** A lecturer in educational technology with over 10 years of experience in multimedia learning design.
- **Content Expert:** A senior lecturer in English education specializing in teaching English to young learners (TEYL).

- **Language Expert:** A linguist and English language instructor with expertise in phonology and applied linguistics.

Each expert assessed the product using a validation questionnaire containing 15 items divided into three main aspects—media design, content accuracy, and language clarity. The questionnaire used a 4-point Likert scale (1 = Poor, 2 = Fair, 3 = Good, 4 = Very Good). The experts were also encouraged to provide qualitative comments and suggestions, which guided product revisions.

3.4 Field Testing and Effectiveness Measurement

After revision, the product was tested in a classroom setting to evaluate its practicality and effectiveness. Students used the interactive digital comic over three consecutive learning sessions (each lasting 60 minutes).

To measure learning improvement, pretests and posttests were administered focusing on six aspects of speaking ability: vocabulary, pronunciation, confidence, interaction, sentence structure, and content understanding. The improvement was analyzed using the N-Gain formula, which measures normalized learning gains.

3.5 Data Analysis

Quantitative data from expert validation and student questionnaires were analyzed using descriptive statistics (mean scores and percentage categories), while qualitative feedback from observations, interviews, and open-ended responses was analyzed thematically to identify trends in student engagement and media usability.

3. RESULTS AND DISCUSSION

3.1. Result

This development research has produced effective English learning media for elementary school students' English-speaking skills. The comics developed will focus on media that can train students' speaking skills, which will include audio buttons so that students can learn the correct pronunciation of conversations or words. In addition, students are asked to imitate the characters' speech in the comics so that they become accustomed to speaking with the correct intonation and pronunciation. Students are not only taught theory but also become active participants in the learning process and directly practice through enjoyable activities.

The use of digital comics can help students develop various indicators of speaking skills, such as fluency, where students can practice expressing ideas spontaneously without many pauses. Accuracy in word choice will also improve as students become familiar with vocabulary tailored to the illustrations presented. The sentence structure (grammar) used can also help students understand the correct sentence patterns in everyday communication. Additionally, interactive features accompanying the comics, such as audio, can train students to read sentences according to their intonation, enabling them to pronounce them naturally. Equally important, the expressions of the characters depicted in the comics can help students understand the correct expressions when speaking words, thereby making their speaking skills livelier and more communicative. This medium not only captures students' attention but also trains and stimulates their imagination and creativity skills. The examples of interactive digital comic media on speaking skill learning can be seen in Figure 1.

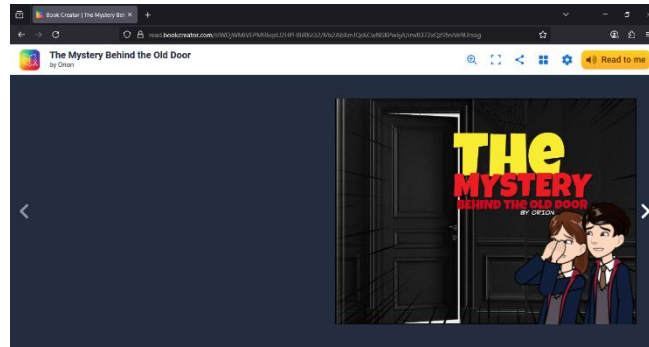


Figure 1: Home Page

Figure 1 show the cover of an interactive digital comic titled “The Mystery Behind the Old Door.” The cover design catches the eye by highlighting the two main characters in the comic, who appear curious and frightened in front of a mysterious door. The comic's title uses bold colors, a combination of yellow and red, to more easily capture readers' attention, especially children. This cover also serves as the first impression users will see before reading the comic.

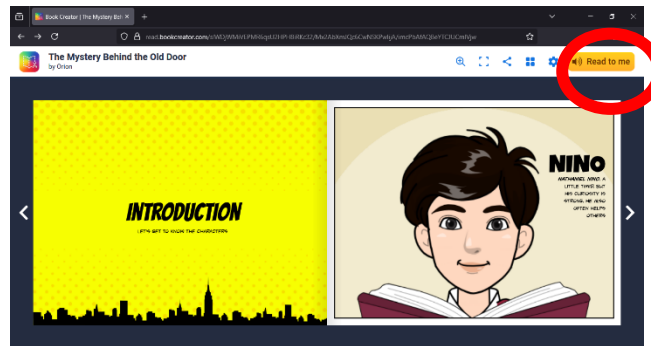


Figure 2: Fitur Read to Me

Figure 2 show the special feature in interactive digital comics: Read to Me. This feature allows the application to read the contents of the comic automatically. This feature helps children who are not yet proficient in reading English or do not know the correct pronunciation. Thus, in addition to increasing interest in reading, this feature also supports the learning of speaking skills, especially in terms of listening and imitating the pronunciation of words.



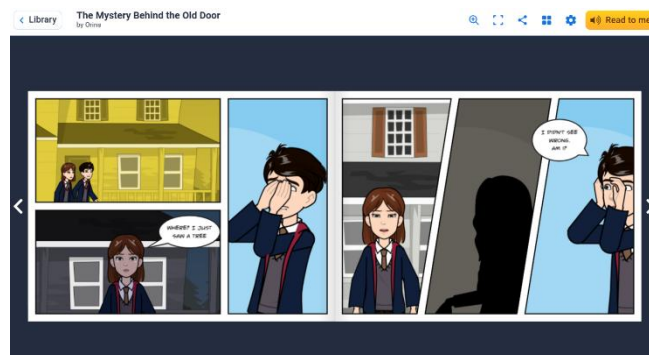


Figure 3: Display

Figure 3 show the screen display when reading digital comics. Users can choose between two display options: single-page view (a full page displayed on one screen) and side-by-side view (two pages displayed side by side). This feature is designed to provide flexibility in reading according to user comfort. With single-page view, users can focus on a full page, while side-by-side view allows for a reading experience similar to opening a physical comic book.

The main findings of this study indicate that the interactive digital comic media developed is effective and suitable for use in improving the English-speaking skills of fifth-grade students. This media may serve as a new approach for elementary school students to learn language and strengthen a student-centered approach.

a) Product Eligibility Validation Result

Table 1 presents the evaluation results from media experts on the design feasibility of the interactive digital comic, covering three main aspects: efficiency, effectiveness, and display quality. Using a four-point Likert scale (1 = Poor to 4 = Very Good), the experts rated all components with an average score of 3.7, categorized as “Very Good.” This result indicates that the developed media demonstrates high efficiency in facilitating user interaction, strong effectiveness in supporting learning objectives—particularly in enhancing students’ speaking practice—and visually appealing design elements appropriate for elementary school learners

Table 1: Percentage of Assessment Result on Design Product Eligibility Aspect

No	Assessment components	Score	Criteria
1	Efficiency	3.7	Very Good
2	Effectiveness	3.7	Very Good
3	Display	3.7	Very Good
Average			Very Good

Table 2 shows the validation results provided by content experts who assessed the accuracy and appropriateness of the learning material presented in the interactive digital comic. The evaluation focused on three key aspects—material suitability, depth, and accuracy—each rated on a four-point Likert scale (1 = Poor to 4 = Very Good). All components received an average score of 3.7, indicating a “Very Good” level of quality. This result demonstrates that the content of the digital comic is aligned with the English curriculum for fifth-grade students, provides sufficient depth to achieve the intended learning outcomes, and maintains high accuracy in language use and topic relevance.

Table 2: Percentage of Assessment Result on Material Eligibility Aspect

No	Assessment components	Score	Criteria
1	Suitability of material	3.7	Very Good
2	Depth of material	3.7	Very Good
3	Accuracy of material	3.7	Very Good
Average			Very Good

Table 3 presents the results of the *language eligibility* assessment for the developed interactive digital comic media. Based on the evaluation conducted by language experts, the three assessed components—*language appropriateness*, *clarity and readability*, and *language appeal*—each received an average score of 3.7, which falls into the “Very Good” category. This indicates that the language used in the comic is suitable for the cognitive level of fifth-grade students, easy to understand, and clearly presented. In addition, the language style is engaging and encourages students to participate actively in speaking activities. Therefore, the language elements in the media are considered effective and appropriate for supporting the English-speaking learning process for elementary school students.

Table 3: Percentage of Assessment Result on Language Eligibility Aspect

No	Assessment components	Score	Criteria
1	Language Appropriateness	3.7	Very Good
2	Clarity and Readability	3.7	Very Good
3	Language Appeal	3.7	Very Good
Average			Very Good

Table 4 presents the results of the teacher and student assessment regarding the use of the interactive digital comic in the learning process. The evaluation covers three main components—*suitability of material*, *depth of material*, and *accuracy of material*—all of which received an average score of 3.7, categorized as “Very Good.” This indicates that the content of the comic aligns well with the curriculum requirements and the learning objectives for fifth-grade students. The material is considered sufficiently comprehensive and accurate for supporting English speaking skill development, while also being relevant and understandable for young learners. Overall, the results suggest that the digital comic is not only pedagogically appropriate but also practical and effective for classroom use.

Table 4: Teacher and Student Assessment of the Product

No	Assessment components	Score	Criteria
1	Suitability of Material	3.7	Very Good
2	Depth of Material	3.7	Very Good
3	Accuracy of Material	3.7	Very Good
Average			Very Good

The overall evaluation by classroom teachers showed that the digital comic received an average score of 4.0, which falls into the “Very Good” category. This indicates that this medium can be used in the classroom and has great potential to help children learn to speak English in a fun, engaging, and informative way.

b) Product Effectiveness Validation Result

Researchers administered tests to students before and after the use of the interactive digital comic to determine its effectiveness in improving speaking skills. The assessment measured six key aspects of speaking performance: vocabulary, pronunciation, confidence, speaking interaction, sentence structure, and content understanding. These components were evaluated both prior to and following the implementation of the media to observe changes in students’ speaking abilities.

Table 5: Student Pre-Test Assessment

ASPECT	n	$\sum X$	$\bar{X}$
Vocabulary	21	39	2
Pronunciation	21	29	1
Confidence	21	21	1
Speaking Skill	21	35	2

Sentence Structure	21	26	1
Content Understanding	21	26	1

Table 5 displays the students' pre-test results before the implementation of the interactive digital comic media. The scores indicate that students' English-speaking skills were still relatively low across all measured aspects. Vocabulary and overall speaking skill showed an average score of 2, while pronunciation, confidence, sentence structure, and content understanding each received an average score of only 1. These results suggest that, prior to the use of the developed media, students had limited mastery in producing spoken English, lacked confidence when speaking, and had difficulty selecting appropriate vocabulary and constructing sentences. Overall, the pre-test outcomes highlight the need for a learning medium that can effectively support and enhance students' speaking abilities

Table 6: Student Post-Test Assessment

ASPECT	n	ΣX	$\bar{X}$
Vocabulary	21	81	4
Pronunciation	21	60	3
Confidence	21	80	4
Speaking Skill	21	79	4
Sentence Structure	21	65	3
Content Understanding	21	77	4

Table 6 presents the post-test results obtained after students were taught using the interactive digital comic media. The data show a significant improvement across all aspects of speaking skills compared to the pre-test results. Vocabulary, confidence, speaking skill, and content understanding each reached an average score of 4, indicating strong progress in students' ability to express ideas clearly and confidently. Meanwhile, pronunciation and sentence structure also increased to an average score of 3, showing better accuracy in speech production and sentence formation. These improvements demonstrate that the use of interactive digital comics effectively enhanced students' speaking performance, supporting the development of both linguistic competence and communicative confidence.

Table 7: Result of Students Effectiveness Assessment

No	Assessment components	Pre-Test	Post-Test
1	Vocabulary	2	4
2	Pronunciation	1	3
3	Confidence	1	4
4	Speaking Interaction	2	4
5	Sentence Structure	1	3
6	Content Understanding	1	4
Amount		8	22
$N - \text{Gain} = \frac{22-8}{24-8}$			
$N - \text{Gain} = \frac{14}{16}$			
$N - \text{Gain} = 0.87 \text{ (high)}$			

Table 7 summarizes the effectiveness of the interactive digital comic by comparing the students' pre-test and post-test scores and calculating the N-Gain value. The total score increased from 8 in the pre-test to 22 in the post-test, indicating a substantial improvement in students' speaking abilities after the media was implemented. The N-Gain value was calculated as 0.87, which falls into the "High" effectiveness category. This means that the interactive digital comic had a strong positive impact on enhancing students' vocabulary, pronunciation, confidence, speaking interaction, sentence structure, and content understanding.

Overall, the results clearly demonstrate that the developed learning media is highly effective in improving English speaking skills among fifth-grade students.

3.2 Discussion

This study demonstrates that interactive digital comics are effective in improving the speaking skills of fifth-grade students. Aside from supporting practical classroom learning, this finding also contributes to the theoretical development of language learning strategies. The results show that this innovative medium successfully addresses real challenges in the current educational context.

The effectiveness of digital comics aligns with constructivist theory, which—as stated by Tebogo Mogashoa in Kusumawati [11]—explains that *“humans generate knowledge and meaning from the interaction between ideas and experiences they have had.”* This theory emphasizes that students learn better when they actively participate in the learning process. Digital comics create opportunities for students to engage, take on roles within the narrative, and practice speaking in meaningful contexts. This supports the idea that direct experience and active engagement foster stronger knowledge construction. Furthermore, previous studies conducted by Abrori [12], Akcanca [13], and Sentürk & Simsek [14] state that *“educational comics play a role in simplifying complex scientific concepts through visualization and storytelling, thereby helping students understand difficult material.”* These findings confirm that educational comics serve as an effective medium to bridge the gap between abstract concepts and students’ real experiences, making learning more comprehensible and meaningful. Rizcallah & Parlak [15] also highlight the linguistic advantages of comics, noting that *“the comics condition afforded a modest advantage in helping participants maintain receptive vocabulary gains over time and achieve short-term improvements in productive vocabulary.”* These results support the findings of this study, as vocabulary development through comics contributes to improved speaking fluency. Additionally, Cimermanová [16] argues that comics help foreign language learners overcome linguistic barriers using guessing strategies. Her research shows that *“possible positive effects exist in vocabulary development, motivation to read, and overcoming linguistic barriers by using context and prior knowledge.”* This indicates that the use of comics not only benefits reading literacy but also enhances speaking skills, since students gain confidence in using vocabulary understood through contextual clues. Similarly, Aridasarie and Rohmah [17] found that *“different modes of texts including a printed comic page, a story audiotape, and printed puppet characters help students gain confidence to speak in English and reinforce creativity and fluency.”* These findings highlight that multimodal media provide a richer learning experience, enabling students not only to speak more confidently but also to develop creativity and natural language fluency.

From a practical perspective, teachers reported that digital comics are easy to use without requiring special training, making them an ideal solution for schools with time or technological constraints. Digital comics are also aligned with curriculum needs and able to stimulate student engagement through visually appealing and interactive elements. In addition, they address the challenge of motivating students who often perceive English learning as difficult and stressful. By offering a visually enjoyable and narrative-based learning experience, digital comics create a positive learning environment and help build students’ confidence in speaking. However, this study does not fully determine whether these positive effects will persist in the long term. Future studies are needed to explore the sustainability of the results and the applicability of digital comics in different cultural or geographical contexts. Moving forward, the development of digital comics may incorporate more advanced technologies, such as voice recognition for real-time feedback. These innovations would strengthen digital comics as independent learning tools. Finally, digital comics are not only an engaging learning medium but also have the potential to transform language teaching practices. With their dynamic and student-centered nature, digital comics deserve a place in future educational settings, particularly in schools with limited resources.

4. CONCLUSION

Based on the findings of this study, interactive digital comics are effective in improving the speaking skills of fifth-grade elementary school students. The media was validated by experts and implemented in classroom practice, and the results show that it meets the criteria of validity, practicality, and effectiveness. Students demonstrated higher interest and active participation during speaking activities, indicating that the interactive elements and visual storytelling successfully support engagement and learning. These results suggest that digital comics can serve as an alternative instructional medium that supports language learning in an enjoyable and meaningful way.

Although the outcomes are positive, this study was limited in scope to a short implementation period and a single subject area. Future research is recommended to investigate the long-term effects of digital comics on speaking development, as well as their application to other subjects and different educational levels. Further development may also consider integrating additional features such as voice recording or automatic feedback to enhance learning. Continuous refinement and broader testing will help strengthen the potential of interactive digital comics as a sustainable and scalable educational tool.

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