

The Use of Digital Comics in the EFL Contexts: A Systematic Review of Quantitative Studies

Komang Icha Sri Handayani¹, Ni Wayan Surya Mahayanti², Ni Luh Putu Era Adnyayanti³

^{1,2,3} Universitas Pendidikan Ganesha, Indonesia

Email: icha.sri@student.undiksha.ac.id

Abstract

The integration of technology in education has improved the efficacy of pedagogical activities, making it easier for both teachers and students. Digital comics with their captivating features could attract learners and improve outcomes in English as a Foreign Language (EFL). This systematic literature review with content analysis synthesized nine articles from educational journals (2020-2025) to investigate research trends and the effectiveness of digital comics on English language skills. The current study found that the quantitative approach with a quasi-experimental design using pre-test and post-test instruments dominated the trend, with undergraduate students as the most studied group. The application used varies between custom web-based tools and existing platforms like Webtoon. Targeted skills range from primary-level literacy to Higher-Order Thinking Skills (HOTS) for standardized tests such as the TOEFL. Finally, the findings suggest that digital comics are proven effective as media for enhancing English skills across various educational levels.

Keywords: Digital Comics, EFL, Quantitative Studies, Systematic Literature Review.

INTRODUCTION

Technological advancements have reshaped human life, specifically within the educational sector (Saputri & Musadad, 2021). By integrating technology in the classroom, both teachers and students can engage in learning activities more efficiently. One technology-based learning medium is digital comics, which McCloud (2008) defines as a series of pictures and symbols designed to convey information and evoke aesthetic responses (as cited in Saputri & Musadad, 2021). As a medium, comics are highly influential because their visual storytelling and concise narratives naturally attract learners (Akcanca, 2020; Das & Singh, 2022, as cited in Belda-medina, 2024).

In the context of English as a Foreign Language (EFL), this blend of text and imagery provides helpful contextual cues and cultural references that enhance comprehension, as well as creativity and critical thinking skills (Nurchurifiani & Zulianti, 2021). Furthermore, digital comics may contain multiple engaging features such as animations, sounds, and hyperlinks, which offer an immersive experience that greatly aids language development (Joannidou & Sime, 2021; Themelis & Sime, 2020). Essentially, leveraging digital comics not only makes literacy skills achievable and enjoyable but also allows learners to think and write more efficiently (Akcanca, 2020; Pange, 2022, as cited in Belda-medina, 2024).

To validate the educational benefits of digital comics, a quantitative review of current studies is necessary. While qualitative data captures student engagement, quantitative research provides the statistical rigor needed to measure cognitive gains. By employing pre-test and post-test experimental designs, researchers can calculate the effect size of digital comics on critical thinking skills. For example, comparing the mean scores of EFL learners

who utilize multimedia-rich comics against those using text-only materials enables a precise determination of how visual scaffolding impacts long-term retention and creative output (Akcanca, 2020).

Despite the large number of individual studies on this topic, there is a limited number of a systematic synthesis that categorizes these findings. Hence, educators and researchers lack an integrated overview of which specific software platforms and research methodologies yield the most effective results. This study is a systematic literature review that aims to synthesize the current state of digital comic research in the EFL context by applying a content analysis of nine selected articles. By systematically examining the types of research, subjects, instruments, applications, targeted English language skills, and the overall results of the effectiveness of digital comics, this study provides a structured foundation for understanding the field's current state. To achieve these objectives, the study is intended to address the following research questions: (1) Which research designs, participant groups, and instruments are primarily employed? (2) Which digital comic applications (custom-made vs. existing platforms) are most frequently used in these interventions? (3) Which English language skills are most commonly targeted, and what is the overall effectiveness of digital comics in improving these skills?

METHOD

The data collection procedure for this research systematically follows the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) protocol. The literature search was conducted in January 2026 across several reputable databases, including Google Scholar, ERIC, and journals registered with SINTA (levels 1-5), to ensure the quality of the reviewed articles.

Specific keywords in both Bahasa Indonesia and English were utilized to select relevant studies, specifically: Komik, Comic, Digital Comic, and Digital Comics in EFL. To obtain the latest study, the search was restricted to the period between 2020 and 2025. A total of 30 journals were initially identified, primarily within the fields of education and educational technology. Following the screening process, which involved reviewing the titles and abstracts and removing duplicate records, 9 articles met the final criteria for in-depth analysis.

The instrument of this study was a content analysis guideline adapted from Fitriyanti et al. (2023). This guideline was modified to suit the current research objectives and focuses on five main aspects: (1) the type of research, (2) the research subject, (3) the data collection instruments, (4) the type of digital comic application, and (5) the language skills targeted.

Table 1. The Aspects and Categories Used for Content Analysis

Aspect	Categories
Type of research	A.1. Quantitative Research A.2. Qualitative Research A.3. Mixed Methods A.4. R&D A.5. CAR
Research subjects	B.1. Kindergarten students B.2. ES students B.3. JHS students B.4. SHS students B.5. Undergraduate students B.6. Pre-service teacher
Data collection instrument	C.1. Test (pre/post) C.2. Questionnaire C.4. Interview C.5. Test & Interview

	C.3. Observation	C.6. Questionnaire & Observation
Apps type	D.1. Canva	D.4. Makebeliefscomix
	D.2. Pixton	D.5. Mixed apps
	D.3. Webtoon	D.6. Not reported
The targeted skills	E.1 Reading	E.6. Grammar
	E.2. Writing	E.7. Communication
	E.3 Speaking	E.8. English learning outcomes
	E.4. Listening	E.9. Standardized English Proficiency
	E.5. Vocabulary	

A total of nine articles were categorized into several aspects by analyzing the information provided in the abstracts, methods, and discussions. To clearly present these classifications, the data were compiled into a clustered column chart.

FINDINGS AND DISCUSSION

Finding

Research types specify the methods and techniques to be employed. According to the data in Figure 1, quantitative research emerged as the most dominant design used by the researchers to investigate the effectiveness of digital comics across various language skills in EFL contexts.

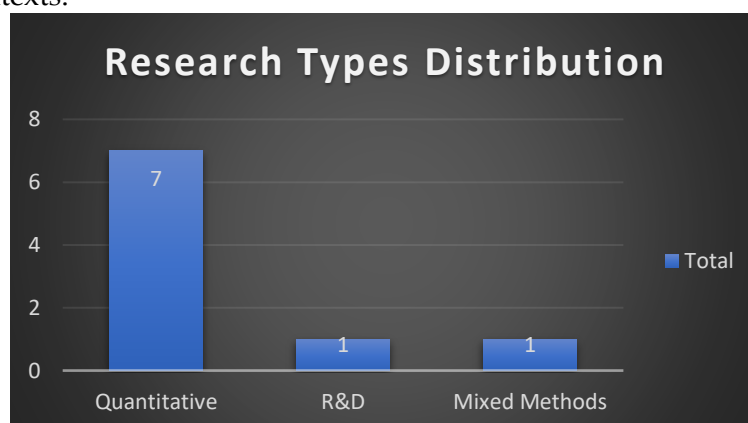


Figure 1. The distribution of research on comics categorized based on the types of research

The distribution of research methods and their corresponding instruments among the nine reviewed articles is summarized in Figure 1. As shown in the data, quantitative methods dominated the distribution, employed by 77.8% (n=7) of the studies to investigate the effect of digital comics on participants' English language skills. In these studies, pre-test and post-test were used to measure the outcomes. The remaining 22.2% (n=2) studies were divided equally (11.1% each) and used Research and Development (R&D) and Mixed Methods, respectively. The R&D study followed the ADDIE model to develop the comics. Regarding the instruments used, the R&D and Mixed Methods studies used a combination of instruments, such as tests paired with interviews or questionnaires paired with observations.

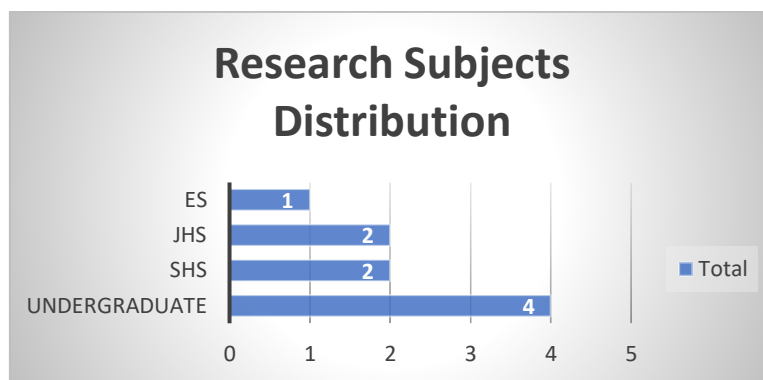


Figure 2. The distribution of research subjects

This chart shows the distribution of research subjects across the nine reviewed articles. The majority of the studies focused on higher education, with 4 studies (44.4%) including undergraduate students. This was followed by secondary education, where Junior High School (JHS) and Senior High School (SHS) students were each the subject of 2 studies (22.2%) separately. The least group was Elementary School (ES), which was the subject of only 1 study (11.1%)

Table 2. The Categorization of Data Collection Instrument

Instrument category	Frequency (f)	Percentage (%)
Test (pre-test and post-test)	7	77.8%
Test & Interview	1	11.1%
Questionnaire & Observation	1	11.1%
Total	9	100%

As presented in Table 2, the majority of the studies (77,8%) employed pre-test and post-test as the instrument to measure students' progress in the targeted skills. A smaller portion of the studies (22.2%) employed multiple instruments to triangulate the data, specifically combining tests with interviews or questionnaires with observations.

Tabel 3. The Categorization of Comic-Maker Application

Study	Application/tools reported	Category
Utomo & Ahsanah (2023)	Not reported	-
Ahsanah & Utomo (2020)	Pixton	Web-based tool
Taka (2022)	Not reported	-
Sandika & Novita (2021)	Not reported	-
Ghofur (2022)	Not reported	-
Arief et al. (2022)	Not reported	-
Flores-González et al (2024)	Canva, Makebeliefscomix, and Pixton applications	Web-based tool
Winarti & Kusuma (2024)	Webtoon	Web-based platform
Larisa et al. (2023)	Webtoon	Web-based platform

In terms of comic maker applications, the researchers utilized web-based tools such as Canva, Pixton, and MakeBeliefsComix, which allow the researchers to customize and

develop the comic strips. In contrast, other studies used Webtoon, an existing digital comic platform. Despite these distinct choices, a significant number of researchers did not specify whether they developed custom digital comics or utilized existing ones.

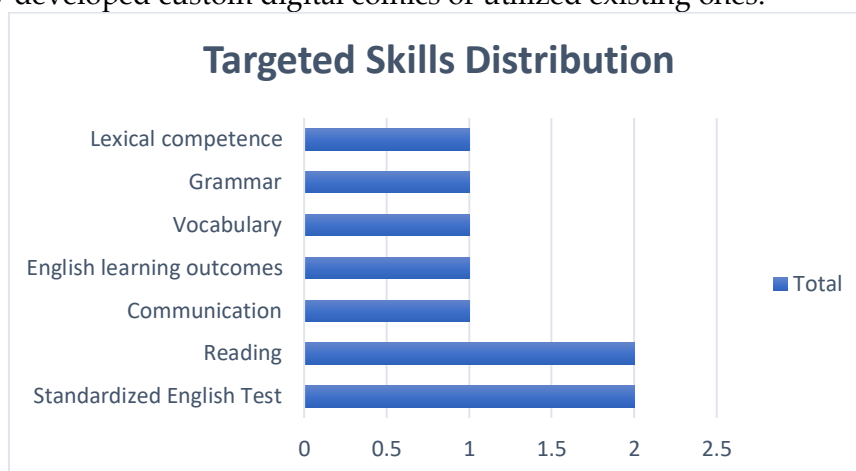


Figure 3. The distribution of English language targeted skills

The finding shows that Standardized English Proficiency and Reading are the most prominent focus areas among the reviewed studies. In this context, a standardized test refers to the use of digital comics to improve students' scores in examinations such as EPT and TOEFL. Regarding reading, the research primarily examined the impact of digital comics on students' comprehension of narrative texts. The remaining studies were distributed across specific skills, including vocabulary, grammar, communication, and lexical competence. Above all, there is one study targeted general "English learning outcomes" without specifying a specific English skill.

Table 4. The Result of The Reviewed Articles on The Influence of Digital Comic in Participants' English Skills

No	Research Author	Journal Identity	Research Result
1	(Utomo & Ahsanah, 2023)	VOLES Voice of English Language Education Society Vol. 7, No. 1; April 2023 Pages 57-65	There is a significant increase in students' EPT scores, as indicated by the improvement from pre-test scores ($M = 360, SD = 37.117$) to post-test scores ($M = 432, SD = 44.927$). Statistical analysis showed a p-value of $p < .001$, which is well below the 0.05 threshold of significance. These results indicate that the use of digital comic-based modules has a substantial influence on enhancing students' EPT performance.
2	(Ahsanah & Utomo, 2020)	IDEAS Journal of Language Teaching and Learning, Linguistics and Literature	The result shows that there is an improvement in students' English competence, particularly their TOEFL scores, after the implementation of digital comics. It can be seen from the result of the paired samples t-test, which revealed a mean difference of 24.762 between the pre-test and post-test scores,

		Volume 8, Number 2, December 2020 pp. 373 – 383	with a standard deviation of 29.192 and a standard error mean of 4.504. The obtained t-value was 5.497, with a significance value of $.000 < 0.05$.
3	(Taka, 2022)	IDEAS Journal of Language Teaching and Learning, Linguistics and Literature Volume 10, Number 1, June 2022 pp. 882 - 892	The findings showed a marked improvement in students' reading performance after the treatment. The mean score increased from 40.00 ($SD = 8.22$) in the pre-test to 75.00 ($SD = 11.27$) in the post-test. This proved that digital comics as media is effective in developing students' competence in reading skill among the tenth-grade students at SMA Kristen Mercusuar Kupang.
4	(Sandika & Novita, 2021)	Academia Open, Vol 4, June 2021	The results indicate that the use of digital comics led to a significant increase in students' grammatical knowledge. It is supported by the paired sample t-test, which yielded a Sig. (2-tailed) value of $0.000 < 0.05$. Furthermore, the post-test value is higher than the pre-test value.
5	(Ghofur, 2022)	Journal of Innovation in Educational and Cultural Research Volume 3 Issue 3 Year 2022 Pages 432-444	The development of digital comic media for the English class, following the ADDIE model, was validated by both media and material experts. Their evaluations concluded that the developed comics meet the criteria of media developmental standards, achieving a very decent average predicate. Furthermore, the application of digital comics can improve communication skills in English very well, particularly in students' abilities to infer meanings, construct arguments, define concepts, and generalize information.
6	(Arief et al., 2022)	International Journal of Society, Culture & Language Volume 10, Issue 3 September 2022 Pages 117-124	Students' English learning outcomes had a significant increase after learning with digital comics. The experimental group demonstrated a statistically significant improvement ($t(39) = - 14.70, < 0.05$, rising from an initial average of 18.42 to 25.60. In contrast, the control group's increase (from 19.17 to 24.00) was not statistically significant ($t(39) = - 1.88, p > 0.05$). Therefore, the well-structured implementation of digital comics led to a substantial 45.82% increase in learning outcomes for the experimental group, outperforming the control

			group.
7	(Flores-González et al., 2024)	IAFOR Journal of Education, Volume 12, Number 2, Page 149-172 2024	This study found that using e-comics created with applications like Canva, Makebeliefscomix, and Pixton significantly improved English language learners' lexical competence. Specifically: <ol style="list-style-type: none"> 1. Participants showed significant progress in both receptive and productive vocabulary skills after engaging with e-comics. 2. Pixton was particularly effective, obtaining the highest post-treatment vocabulary scores 3. The integration of digital comics enhanced learners' motivation, attention to key vocabulary, memory retrieval, and mental imagery formation.
8	(Winarti & Kusuma, 2024)	Lingua Scientia Volume 31, Number 2, 2024 pp. 143-153	This research found that students who were taught using Webtoon media in learning had better reading mastery, especially in vocabulary development, compared to those who were taught using conventional methods.
9	(Larisa et al., 2023)	Issues in Applied Linguistics & Language Teaching Volume 05, Issue 02, 2023, pp. 99-105	The research findings reveal that students who were instructed using English comic webtoons demonstrate better understanding of meaning, particularly within narrative texts, compared to those who received traditional lecture-based instruction.

Discussion

The content analysis of the nine selected articles reveals a clear preference for quantitative research, which was used in seven studies. This trend is in line with the view of Lakshman et al (2000), who stated that quantitative approaches are essential for examining numerical effects of an independent variable, in this case, digital comics, on English language outcomes. Specifically, five of the studies employed a quantitative approach with quasi-experimental designs, which provide strong evidence by comparing digital comic-integrated instruction against control groups. The remaining four studies adopted pre-experimental designs, focusing on pre-test and post-test gains within a single group. All in all, the primary instruments for measuring gains in English proficiency are the pre-test and the post-test. On the other hand, the remaining two studies adopted more comprehensive approaches, namely Research and Development (R&D) using the ADDIE model and a mixed-methods approach. These two studies go beyond purely numerical data by integrating qualitative instruments, such as interviews and observations, to provide a deeper context for the quantitative findings.

Research suggests that comics can enhance academic performance across all age groups, particularly in EFL contexts. Among the reviewed articles, the primary subjects

were undergraduate students, followed by senior and junior high school students, who shared an equal distribution. Elementary school students were the least represented group. The dominance of undergraduate students in the selected research participants is likely driven by the educational demands of the tertiary level, where digital comics are used to simplify complex linguistic challenges. Most of the studies in the reviewed articles utilized digital comics to bolster high-stakes academic competencies. This is evidenced by the focus on the standardized proficiency measures such as the English Proficiency Test (EPT) and TOEFL, as well as the development of lexical competence and communication skills (Utomo & Ahsanah, 2023; Ahsanah & Utomo, 2020; Ghofur, 2022; Flores-González et al., 2024). Since standardized proficiency tests, such as TOEFL and EPT, require Higher-Order Thinking (HOT) skills, digital comics act as a helpful tool for undergraduate students to achieve higher scores on these critical assessments. While senior and junior high school studies focused on foundational linguistic bases, such as reading comprehension, grammar, and vocabulary (Taka, 2022; Sandika & Novita, 2021; Winarti & Kusuma, 2024; Larisa et al., 2023), the data reveal a significant drop-off in research at the primary level. Furthermore, among the nine articles reviewed, no research investigated the impact of digital comics on pre-service teachers. This gap suggests that while research confirms comics are effective for learning English, there is a lack of attention on how future educators are being trained to implement these digital tools in their own classrooms.

In the analysis of comic-making applications, the researchers utilized web-based tools such as Canva, Pixton, and MakeBeliefsComix, which allow the researchers to customize and develop the comic strips. In contrast, other studies used Webtoon, an existing digital comic platform. Despite these distinct choices, a significant number of researchers did not specify whether they developed custom digital comics or utilized existing ones. This unavailability of transparency may refer to the main research objective, which is to measure the overall impact of digital comics on students' English skills, rather than the process of developing the digital comic media itself.

Regarding the targeted skills, the researchers primarily focused on improving skills in Reading Comprehension and Standardized Proficiency (TOEFL/EPT). Broadly speaking, standardized tests like TOEFL and EPT require High-Order Thinking Skills (HOTS), and the use of digital comics is probably viewed as a solution to tackle academic challenges. Conversely, narrative texts are naturally built on stories, and it is the main genre for comic implementation.

While vocabulary and grammar were addressed in several studies, the general trend moves toward Higher-Order Thinking (HOT) skills required for university-level examinations. In contrast, studies targeting elementary students, such as the research by Arief et al. (2022), tend to focus on general English outcomes. It can be inferred that, for young learners, digital comics are used as a holistic tool to build a broad foundation in English.

Regarding the overall effectiveness of digital comics across various academic levels, all nine reviewed articles consistently concluded that digital comics are an effective medium for enhancing English skills, ranging from foundational skills like vocabulary and grammar to more complex areas such as reading comprehension and scores on standardized tests (EPT/TOEFL). These improvements were statistically significant across all studies, confirming the reliability of the media. Furthermore, besides numerical results, the

implementation of digital comics received positive qualitative feedback from participants (Arief et al. 2022), implying that the media's success is coming from its pedagogical efficacy and its ability to encourage students' engagement.

CONCLUSION

Nine articles published between 2020 and 2025 across Google Scholar, ERIC, and SINTA-accredited journals have been reviewed. The findings indicate that the predominant type of research is quantitative, with pre-test and post-test designs serving as the main instruments for measuring students' progress. Undergraduate students are portrayed as the most frequently studied subject. In terms of digital comics applications, the studies are categorized between the use of web-based tools and existing digital platforms like Webtoon. Finally, the targeted skills range from general English outcomes in primary education to reading comprehension, grammar, and Higher-Order Thinking Skills (HOTS) needed for standardized proficiency tests such as EPT and TOEFL. Generally, the evidence proves that digital comics are a versatile and effective medium to enhance English language learning across diverse educational levels.

Based on the results and discussion, recommendations for further research have been constructed. Future research may investigate the impact of digital comics on pre-service teachers. This would help to determine if they are being trained properly to implement this digital tool in their own classrooms. In addition, the researchers should be more transparent about the apps and development process they use. Clearly stating whether they used custom-made comics or existing platforms is essential for others to recreate and learn from their work.

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