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The Effectiveness Of Use Of Digital Comic Media In Increasing Primary School Students Interest In Learning Science : A Systematic Literatur Review

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ABSTRACT

The use of digital comic media in science learning in elementary schools has become a trend in an effort to increase students' interest in learning. This study aims to analyze the effectiveness of the use of digital comic media in increasing the interest in learning science of elementary school students. Using a systematic literature review method conducted over the past five years (2020-2024), the researcher found 2,070 related article documents and analyzed 6 relevant articles from Google Scholar. The results of the analysis show that digital comic media is effective in increasing the interest in learning science of elementary school students because of its interesting and interactive nature and its ability to simplify abstract science concepts so that they are easy to understand. However, for its optimization, the use of this media requires proper design and management by teachers, especially in science subjects.

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Introduction

In the ever-evolving digital era, the use of digital comic media has become a spotlight in education. This media promises an interesting and interactive approach in the learning process, especially for subjects (science) at the elementary school level. Through the application of digital comic media, teachers are able to utilize technology to increase students' interest in learning science, which is often considered complicated and difficult to understand learning (Yulilina et al., 2023).

Increasing interest in learning science is important in basic education, as it can form a strong knowledge base for students at higher levels. However, challenges in attracting students' attention to science are often faced by teachers, given the complexity of the material and the lack of visual appeal. This is where digital comic media enters the role, as a tool that allows the delivery of science material in a more fun and easy-to-understand manner for students. Digital comic media with compelling images and narratives can effectively improve understanding of abstract science concepts, as it increases engagement and helps in conveying complex ideas through more accessible ways (Wimbo et al., 2022). By using this approach, teachers are able to create a more enjoyable and easier to digest science learning atmosphere for students, as well as being able to improve their interest in learning. Then, digital comic media also allows

teachers to integrate different types of multimedia, such as animation and sound, to enrich the student learning experience.

The application of digital comic media is also able to create student involvement in science learning. By presenting material through a more interactive format, students become more positive towards teaching and learning activities which, in turn, will expand their understanding of science concepts. Moreover Digital comic media allows self-paced learning to be accessed flexibly through their digital devices (Kartono et al., 2023).

However, the effectiveness of the use of digital comic media in increasing interest in learning science in elementary school still requires further research. While there is a lot of evidence to support its benefits, more in-depth research is needed to measure its impact directly on students' academic achievement. In addition, the role of teachers in designing and managing the use of digital comic media also needs to be considered so that its implementation can be maximized. Thus, this article will explain in more detail the effectiveness of the use of digital comic media in increasing the interest in learning science of elementary school students, as well as provide insight into its implications in the context of future education.

Method

The method used is literature review, which is an in-depth study of a scientific topic. By conducting a literature review, researchers can observe developments and progress in the topic, recognize appropriate theories or methods, and find differences between existing theories and their application in the context of the research being conducted (Cahyono & Agus, 2020). The purpose of writing scientific literature is to provide the latest ideas and ideas for readers based on previous research. Another purpose of writing scientific literature is to improve readers' understanding of existing literature and to supplement the corpus of existing literature. (Jackson Nyamubi, 2022). There are five stages required when creating a literature review, according to (Rajendran et al., 2023).

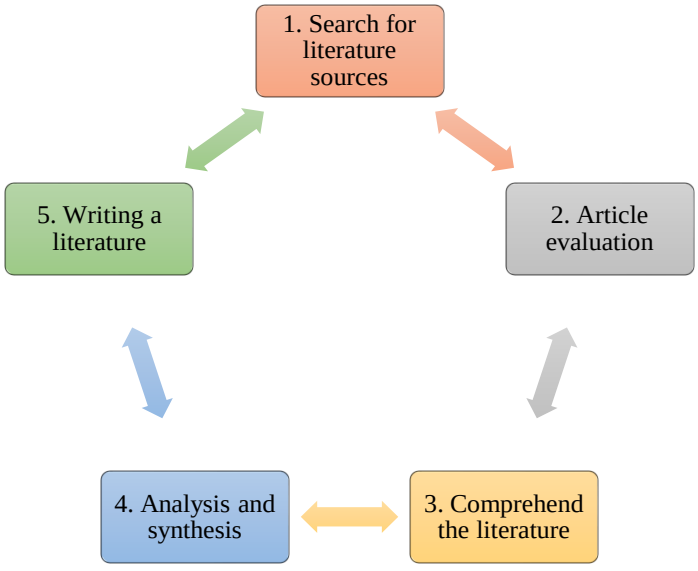
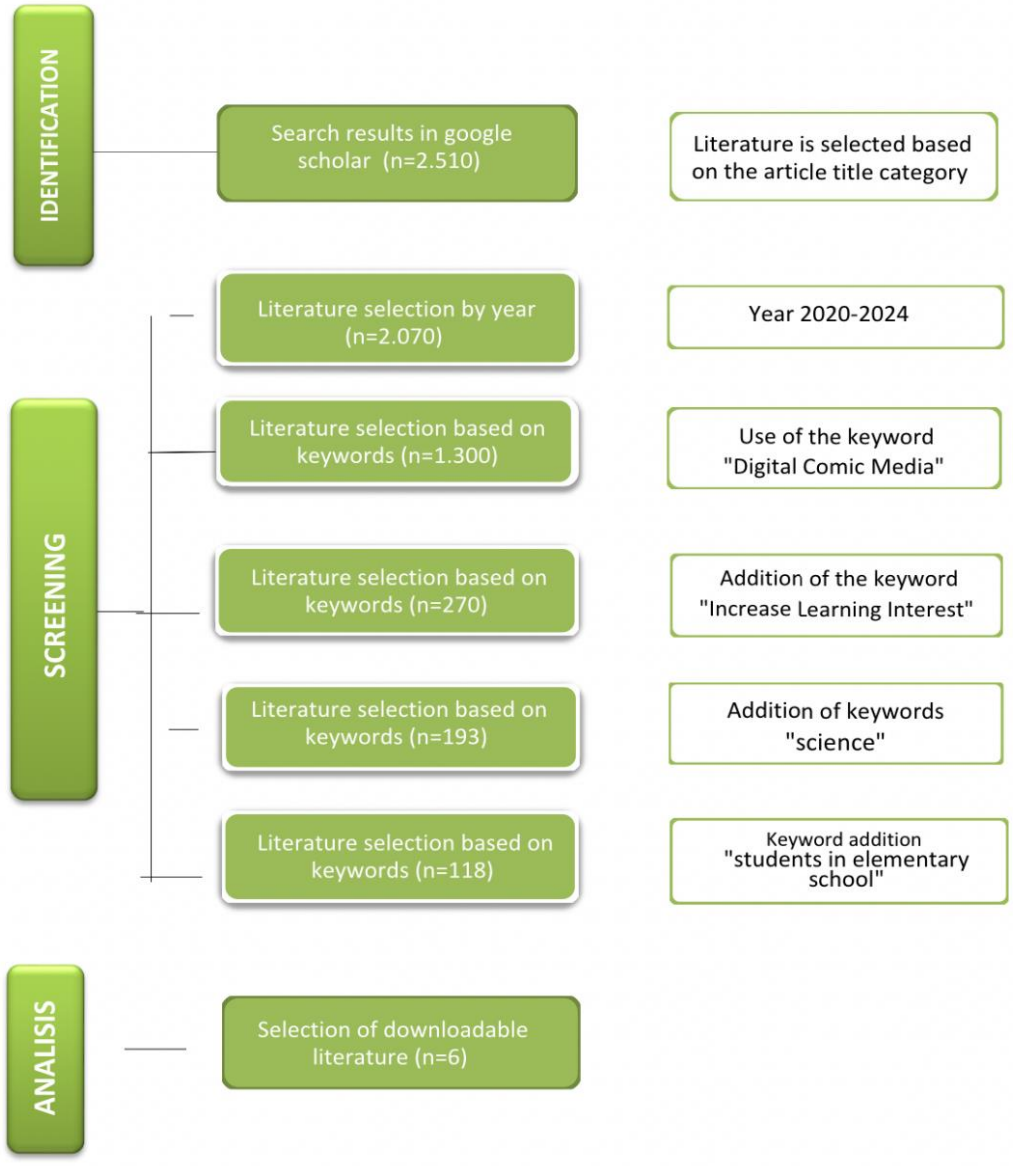


Figure 1. Stages of Literature Review

Inclusion Criteria

The study examined articles published in academic databases between 2020 and 2024. In May 2024, an article search with the keyword "The Influence of the Use of Digital Comics in Increasing Interest in Learning Science in Elementary Schools" in Scholar.google.com. data collection through Google Scholar is focused on "article-based documents" and then the preparation is carried out based on titles and abstracts that include terms related to digital comic media, Increasing interest in learning, science, and elementary school students. Article identification, article screening or selection, and its analysis are all part of the search process. Figure 2 shows the stages taken in this research.

Figure 2. The stages of searching for article documents in systematic analysis are carefully planned to ensure the success of the research process.



Source: Data sorted, 2024

Results and Discussion

The first step in the article document search stage is through accessing the Google Scholar page through the URL https://scholar.google.com/. Article searches will be carried out starting in May 2024, a total of 2,510 documents were collected from literature searches with full text/titles. Then the search for articles will be limited to articles published from 2020 to 2024. 2,070 article documents were obtained published over the last 5 years with the keyword "The Effectiveness of the Use of Digital Comic Media in Increasing Interest in Learning Science of Elementary School Students". The calculation of the articles obtained with the last 5 years is described in diagram 1.

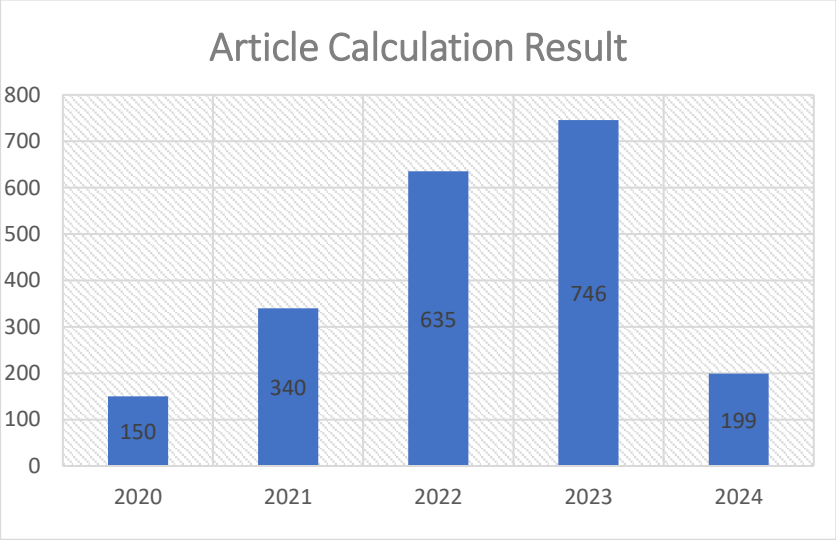


Diagram 1. Shows academic journal publication data from 2020 to 2024 with the keyword Effectiveness of the Use of Digital Comic Media in Increasing Science Learning Interest of Elementary School Students.

In the first stage, the search will be carried out with the keyword "Digital Comic Media". A total of 1,300 articles were obtained of various types. The search results for the keyword "Digital Comic Media" are shown in Figure 3.

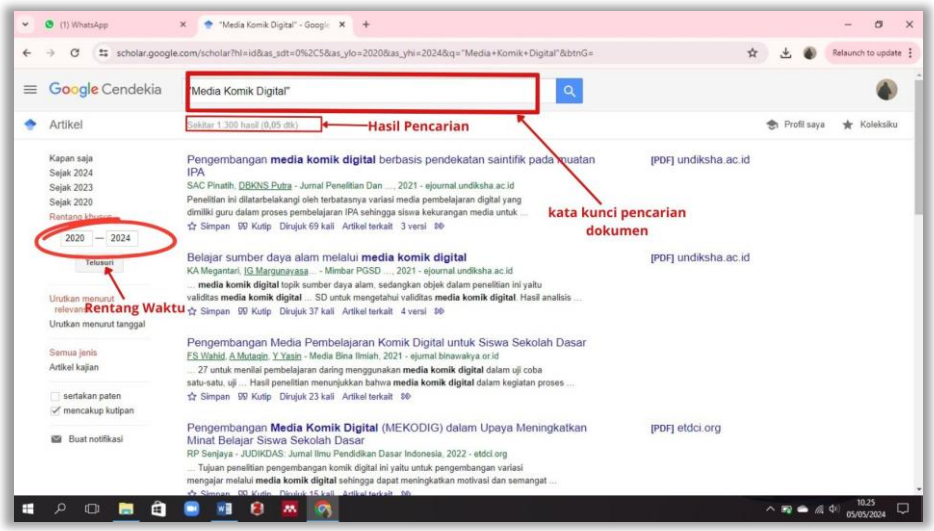


Figure 3. The first stage of the search process is carried out using the keyword "Digital Comic Media"

First, the search results yield 1,300 files of various types. Second, the search using the keyword "Increase Learning Interest" and the word "AND" from the two keywords, resulted in 270 articles from the Google Scholar database. Figure 4 illustrates the second stage of the search.

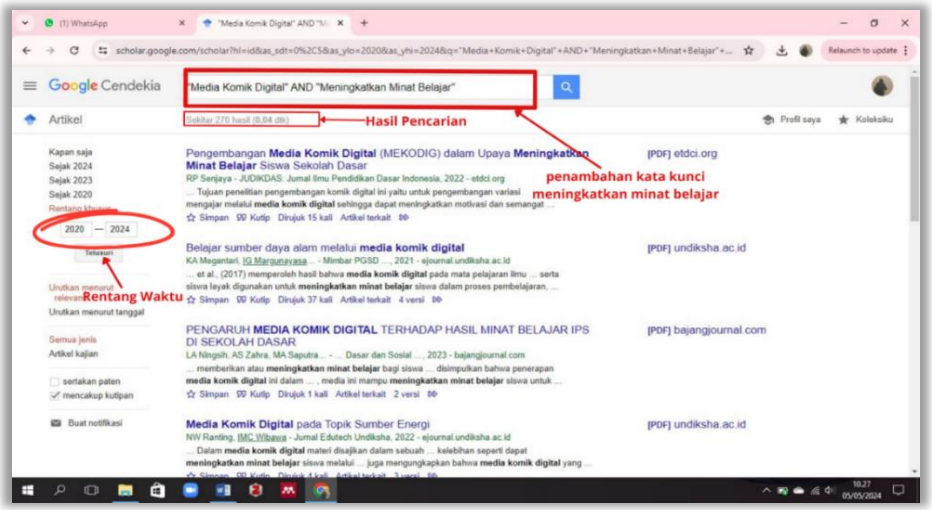


Figure 4. In the second stage of the search process, the keyword "Digital Comic Media" was added along with "Increasing Learning Interest".

The second stage of the search found 270 articles of various types. In the third stage, the keywords "IPA" and "AND" are added between the first and second keywords to obtain relevant articles for further analysis. In addition, the third stage search in the Google Scholar database obtained 270 articles. Figure 5 provides the overall results of the third stage of search.

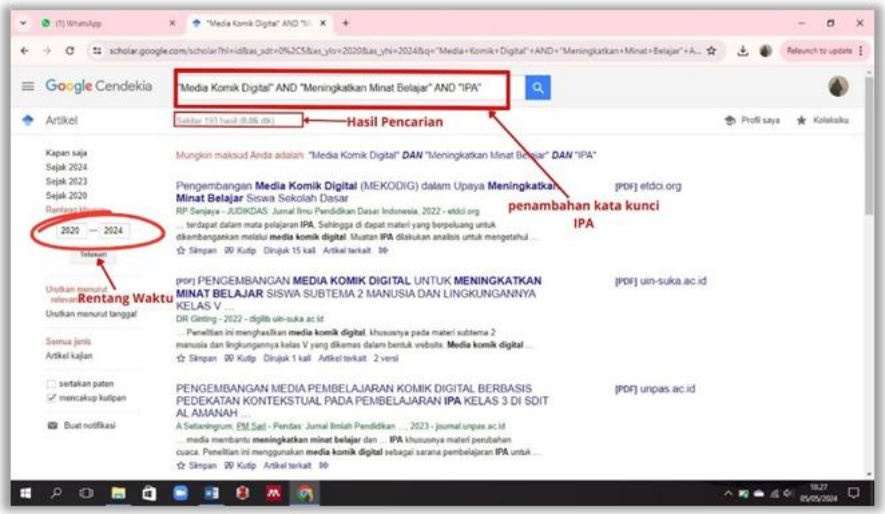


Figure 5. Stage 3 search process with the addition of keywords Digital Comic Media, Increasing Interest in Learning and Science

In the fourth stage of the search, 118 article documents were obtained with the addition of the keyword "Elementary School Students" and inserting the word "AND" between the first, second and third keywords so that the search was more specific and obtained documents for analysis. Figure 6 shows the final results of the overall overview of the 4th stage of the search.

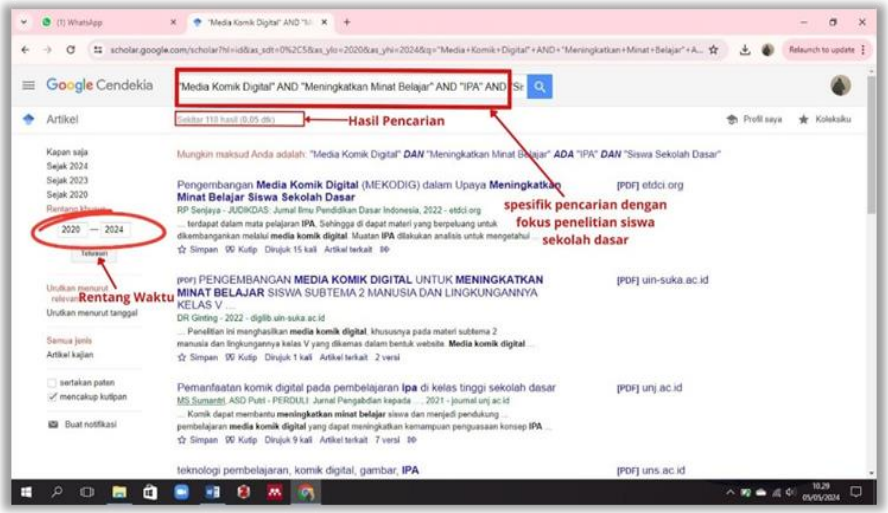


Figure 6. The search process for stage 4 is through the addition of keywords Digital Comic Media, Increasing Interest in Learning, Science and Elementary School Students.

Of the 118 articles available, some of them are considered not to cover the discussion of the material for the following reasons: 1) the discussion is not in line with the specified topic, meaning it is related to the use of digital comic media to increase the learning interest of elementary school students; 2) Not discussing the whole related to learning in elementary schools without focusing on the use of digital comic media; and 3) not discussing learning in elementary schools as a whole. There are 6 articles that are worth reviewing after completing the fifth stage. Table 1 illustrates the results of the analysis of the articles found.

Table 1. Findings

No.	Article	Results/Findings	Science materials developed
1.	Problem-Based Digital Comic Media for Science (Ecosystem) Class V Elementary School (Waisakanitri et al., 2023)	The results of the study stated that the development of digital comic media based on a problem-based learning model was effective for science subjects (ecosystem) in class V. The results of the t-test also showed a significant increase in student interest and learning outcomes.	This material is developed through digital comics to help students understand the concept of ecosystems more easily and interestingly, as well as practice problem-solving skills related to the material.
2.	Digital Comic Media with Comic Life Application to Improve Class VI Science Literacy (Ditriguna et al., 2023)	This research produced digital comic media using the Comic Life application which is considered very valid, practical, and effective to improve the science literacy of grade VI elementary school students. This digital comic media has been proven to increase students' interest in	The science material developed in this digital comic media is material about puberty for grade VI elementary school students. The presentation of material in the form of digital comics helps students relate the concept

		reading, vocabulary mastery, creativity, and understanding of science concepts in daily life.	of puberty science to their daily lives
3.	The Effectiveness of the Use of Digital Comic Media (Cartoon Story Maker) in Learning the Theme of Always Saving Energyi (Riwanto & Wulandari, 2020)	The results of the study show that the use of digital comic media can increase the effectiveness of learning on this theme. The average pre-test score was 60.5, while the average post-test score increased to 75.5. The use of digital comic media also makes students more excited to learn because they can read texts while seeing pictures of cartoon characters.	The science material developed in digital comic media is the theme "Always Save Energy" for 4th grade elementary school students which includes the definition and types of energy, energy sources, changes in energy forms, energy use in daily life, and how to save energy.
4.	Electronic Comic Media Integrated with Augmented Reality in Learning the Human Circulatory System in Elementary Schools (Ningrum et al., 2022)	The results of research by material experts, linguists, media experts, grade 5 teachers and readability tests by students show that the learning media developed is very feasible and can be used as a learning resource. Augmented reality integrated electronic comic media has proven to be very effective in increasing interest in learning science in grade 5 elementary school.	Science material developed in augmented reality integrated electronic comic media is a human circulatory system for grade 5 elementary school.
5.	Application of digital comic media in elementary school science learning. (Choirunisa et al., 2023)	The results of the study show that science learning plays an important role in understanding the universe and everyday phenomena. The application of digital comics to science lessons in elementary schools is able to increase student learning outcomes. Because digital comics are able to make teaching interesting, interactive, and simple for students to understand.	The science material developed for this analysis is natural resources material for grade IV of SDN Manguharjo 01 Madiun City.

6.	Digital Comic Learning Media in Improving the Ability to Understand Natural Science Materials in Elementary School Students. (Kartika, 2023a)	This analysis found that the application of digital comics as a learning medium can increase students' interest and understanding, mainly in lessons (science). Digital comics help students understand material in an interesting and fun way, then it is able to improve science literacy, learning outcomes, and students' interest in learning. Educators need to apply teaching media that are suitable for the lessons learned and easy for students to understand.	This digital comic was developed with the aim of increasing interest, enthusiasm, and the ability to understand science material for elementary school students. By presenting material in the form of interesting digital comics, it is hoped that it can overcome the problem of students who find science lessons boring and difficult to understand. This digital comic combines text, images, and animation content that is able to optimize interpretation and students' ability to remember lessons.

The following are the results of 6 articles that have been analyzed, the use of digital comic media can increase students' interest in learning in elementary school. Research by (Waisakanitri et al., 2023) stated that the development of digital comic media based on a problem-based learning model is effective for science subjects (ecosystem) in class V. The results of the t-test also show a significant increase in student interest and learning outcomes. Further research by (Ditriguna et al., 2023) produce digital comic media using the Comic Life application which is considered very valid, practical, and effective to improve science literacy of grade VI elementary school students. This digital comic media has been proven to increase students' interest in reading, vocabulary mastery, creativity, and understanding of science concepts in daily life. Then research from (Riwanto & Wulandari, 2020) shows that the use of digital comic media can increase the effectiveness of learning on this theme. The average pre-test score was 60.5, while the average post-test score increased to 75.5. The use of digital comic media also makes students more excited to learn because they can read texts while seeing pictures of cartoon characters.

Research by (Ningrum et al., 2022) Material experts, linguists, media experts, grade 5 teachers and readability tests by students showed that the learning media developed was very feasible and could be used as a learning resource. Augmented reality integrated electronic comic media has proven to be very effective in increasing interest in learning science in grade 5 elementary school. Next by (Choirunisa et al., 2023) shows that science learning plays an important role in understanding the universe and everyday phenomena. The application of digital comics to science lessons in elementary schools is able to increase student learning outcomes. Because digital comics are able to make teaching interesting, interactive, and simple for students to understand. The latest research by (Kartika, 2023) found that the application of digital comics as a learning medium can increase students' interest and understanding, mainly in lessons (science). Digital comics help students understand material in an interesting and fun way, then it is able to improve science literacy, learning outcomes, and students'

interest in learning. Educators need to apply teaching media that are suitable for the lessons learned and easy for students to understand.

Digital Comic Media In Increasing Elementary School Students' Interest In Learning

Digital Comic Media offers an engaging and interactive approach to lessons, which is able to spur student interest and engagement. In this digital era, where children are familiar with technology, the use of digital comics can be an effective strategy to produce an innovative and fun learning atmosphere for them. Through digital comic media, it can present good visuals and fun narratives, then be able to attract the interest of elementary school students (Candrayani & Sujana, 2023). Digital comics, with visual elements, improve comprehension and effectiveness in conveying information to students compared to conventional texts (Desi et al., 2022). In addition, the use of technology in digital comics allows the use of sound effects, animations, and interactivity that can add sophistication and appeal to learning. Therefore, making learning activities more effective is also not boring for students, so that they are more motivated to be involved in learning.

Digital comics can be adapted to different levels of difficulty and learning styles of students. Digital comics offer adaptability in social studies learning, cater to the needs of individual students and enhance independent learning by providing a diverse range of content that is aligned with the characteristics of students (Rizka et al., 2022) For example, digital comics can be tailored to different grade levels, or even to the personal interests of students. The ability to customize this content allows students to feel more engaged in learning, as the material presented is relevant and relevant to their interests.

The use of digital comics in learning assists students in understanding digital media formats and developing essential navigation skills, enhancing their digital literacy in the 21st century educational landscape (Sutin et al., 2022). They learn to understand how to convey messages through images and text in digital media, as well as develop critical skills to evaluate the information they receive. Thus, the use of digital comics not only increases interest in learning, but also helps students develop skills relevant to today's digital world. Digital comics can enhance inclusive learning for students with special needs by providing innovative and engaging ways to access educational content, aligned with pedagogical concepts(Eleni et al., 2023). Digital comics can be tailored to the needs of students who have learning difficulties or other special needs, such as dyslexia or hearing loss. For example, text in digital comics can be resized, or read aloud, allowing for easier access for students with reading difficulties. By providing greater accessibility to learning materials, Digital comics help create an inclusive learning environment for every student.

Overall, the use of digital comics in primary school education has the potential to increase students' interest in learning, improve their skills in visual and digital literacy, and create an inclusive and student-oriented learning environment. By utilizing digital teaching tools, educators are able to create an interesting and meaningful learning atmosphere for students, who in the future are able to optimize their academic achievement and involvement in teaching and learning activities.

Conclusion

Based on research on several articles, it is concluded that the use of digital comic media in science learning in elementary schools has proven to be effective in increasing students'

interest in learning. Several researchers support this conclusion by showing that the use of digital comic media in science learning in elementary schools has succeeded in spurring student engagement, student motivation, their understanding of concepts, and cognitive learning outcomes. In addition, digital comics have the ability to improve digital literacy and navigation, which is crucial for students in the 21st century. The use of this medium also allows for more inclusive learning for students with special needs, with appropriate accessibility adjustments. However, it should be noted that the use of digital comic media is highly dependent on the proper design and management by teachers. It is recommended that teachers need to choose appropriate materials, design digital comics well, and integrate them in an effective learning process In addition, additional research is needed to find out how the use of digital comic media has a direct impact on students' academic achievement in science subjects.

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