

Analysis Of The Use of Technology in Improving The Literacy Skills of Elementary School Students : Literature Study

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Keywords

Technology
Literacy skills
Critical thinking

Abstract

This study examines the use of technology to improve the literacy skills of elementary school students. The background reflects the challenges of low interest in reading and comprehension of texts in the digital age, driving the need for innovative solutions. The purpose of the research is to analyze the effectiveness of digital tools such as educational applications, e-books, and interactive games in improving literacy. Using a qualitative descriptive approach and a literature review method, data were collected from journal articles and research reports in 2013–2024. The results show significant improvements in reading ability, digital literacy, and critical thinking through technology integration, as evidenced in studies on "Let's Read" apps and digital media such as Kahoot and QR codes. However, challenges such as limited infrastructure and teacher training remain. The conclusion emphasized the potential of technology as a strategic solution for literacy development, provided that there is collaboration to overcome obstacles. Recommendations include teacher training, equitable access to digital resources, and curriculum-based content development.

1. Introduction

In the ever-evolving digital era, technology has brought significant changes in the world of education, including at the elementary school level. One of the main challenges still faced is the low interest in reading and understanding of the text, which has an impact on their low literacy skills. Literacy in today's era not only includes the ability to read and write, but also includes the skills to understand, analyze, and use information critically and responsibly, including in digital form.

Along with technological advancements, various digital-based learning tools such as educational applications, e-books, and interactive games have begun to be used as solutions to improve students' literacy skills. Several research results have shown that the use of technology in literacy learning has been proven to have a positive impact on students' reading interests, material comprehension, and creativity.

For example, research by Salimodo et al. (2023) highlights the role of technology-based learning strategies such as *Project-Based Learning* (PjBL) and *Flipped Classroom* which have been proven to increase students' motivation and understanding of subject matter. Maruti et al. (2022) also found that the use of Microsoft Teams applications in e-learning activities is able to improve students' digital literacy because it creates a more interactive learning environment.

In addition, Rosyadi et al. (2024) explained that the use of pop-up book media can foster interest in learning and significantly increase students' science literacy. Ulum et al. (2019) also showed that the use of *Google Apps for Education* provides a more collaborative and flexible learning space.

However, the application of technology in literacy learning cannot be separated from various challenges. Some of them are limited facilities and infrastructure, gaps in access to digital devices, and lack of teacher training in optimal use of technology. Therefore, this study aims to analyze how technology can be used effectively in improving the literacy skills of elementary school students, as well as identify challenges and solutions that can be implemented in the field.

By understanding the role and effectiveness of technology in improving student literacy, it is hoped that the results of this research can provide practical recommendations for educators, application developers, and policymakers to optimize the use of technology in literacy learning at the elementary school level.

2. Method

This study uses a descriptive qualitative approach with a literature study method. This means that this research was conducted by examining various written sources such as journal articles, research reports, and other documents relevant to the topic, namely the use of technology to improve the literacy skills of elementary school students.

National and international journal articles published between 2020 and 2024. Sources from trusted databases such as Google Scholar and digital libraries, use keywords, digital literacy of elementary school students, learning technology, elementary e-learning, and children's literacy education applications.

2.1. Method 2

Search for articles that are relevant to the research topic using certain keywords, choose articles that are relevant to the research focus, namely about technology and literacy at the elementary level, read and record the important content of the article, such as the type of technology used, the results of the research, and the recommendations given. Once the data is collected, the next step is to analyze the content of the article. The analysis is carried out by grouping information based on themes, such as the type of technology, its impact on literacy, as well as its constraints and solutions, comparing research results from various sources to see similarities and differences, and drawing conclusions that describe how technology can help improve the literacy skills of elementary school students.

2.1.1. Method 3

To ensure that the data used is really appropriate, the researcher makes several criteria, the article used must contain topics about literacy and technology in elementary schools, the article must be available in the form of full text, so that it can be analyzed thoroughly, articles that are not relevant or only discuss education in general will be excluded from the analysis. To ensure that the data obtained is reliable, researchers compare information from several sources (called triangulation) to make the results more accurate and record the data neatly and systematically, so that no important information is missed.

3. Results and Discussion

Based on the results of studies from several relevant studies, the use of technology in the learning process to improve the literacy skills of elementary school students has shown significant and positive results. Research results from several sources show that the use of digital media such as learning applications, *e-books*, and interactive *games* has been proven to be able to increase students' interest in reading, ability to understand texts, and digital literacy.

3.1. Results and Discussion 2

They should be combined. The study results should be clear and concise. Restrict the use of tables and figures to depict data that is essential to the message and interpretation of the study. The results should be presented in a logical sequence in the text, tables and illustrations. The part of result exposes the findings obtained from research data which is related to the hypotheses. The results should summarize (scientific) findings rather than providing data in great detail. The discussion should explore the significance of the results of the work. Explains the findings obtained from research data along with theory and similar research comparison. Make the discussion corresponding to the results, but do not reiterate the results. The following components should be covered in discussion: How do your results relate to the original question or objectives outlined in the Introduction section (what/how)? Do you provide interpretation scientifically for each of your results or findings presented (why)? Are your results consistent with what other investigators have reported (what else)? Or are there any differences?. Include in the discussion the implications of the findings and their limitations, how the findings fit into the context of other relevant work, and directions for future research.

No.	Researchers And Years Of Learning	Title	Research Results
1.	Dian Luthfiyah And Her	Integration Of Technology In Education: Improving	The Results Of A Study Conducted By Dian Luthfiyah And Her Colleagues (2024) Show That The Use Of Digital Media Such As

	Friends, 2024	In Student Literacy With <i>Digital Reading Media</i>	Kahoot, E-Books, And Digital Articles Can Increase Students' Literacy Skills By 25% Based On Test Results. In Addition, Students Also Feel More Confident In Reading And Understanding Digital Texts. And Teachers Feel More Helped In Delivering Material With The Help Of Technology.
2.	Nurhabibah Et Al., Year 2023	The Utilization Of <i>The Let's Read Application</i> In Improving Reading Literacy Of Elementary School Students	Research Conducted By Nurhabibah Et Al. (2023) Tested The Effectiveness Of The "Let's Read" Application In Improving The Literacy Of Grade 2 Elementary School Students To Provide Positive Results On Students' Reading Ability. The Results Showed A Significant Increase In Post-Test Scores, From An Average Of 45.27 To 49.77 In The Experimental Class. This Shows That The "Let's Read" Application Is Effective In Showing Students' Interest And Reading Skills, As It Offers Content That Is Interesting, Accessible, And Appropriate To Children's Development.
3.	Irma Sary And Zulfan Mazaimi, Year 2023	The Use Of Digital Technology In Improving Students' Information Literacy Skills	The Role Of Digital Literacy In Education By Irma Sary And Zulfan Mazaimi (2023). Research Shows That The Implementation Of Digital Literacy Activities In A Structured Manner (Through The Habituation, Development And Learning Stages) Can Improve Students' Information Literacy Skills, As Well As Be Able To Form Students Who Are More Critical And Creative In Managing Information. Digital Literacy Activities Are Carried Out Before Learning Begins And Involve Access To Digital Content Through Devices Such As Computers Or Smartphones. That Way, Students Become More Accustomed And Trained In Accessing And Understanding Information Digitally.
4.	Sepling Paling And Elisabet Ida Suparyono, 2024	The Utilization Of Digital-Based Learning Technology In Improving Literacy Of Elementary School Students	Sepling Paling And Elisabet Ida Suparyono (2024) Said That The Use Of Digital-Based Learning Media, Such As Educational Videos And Virtual Simulations, Makes Students Better Understand Science Concepts As A Whole. This Creates Interactive And Personalized Learning.
5.	Tunjung Tamarin Rahmadani Et Al., Year 2024	Technology-Based Learning As A Strengthening Of Digital Literacy For Grade V Students Of Sd Supriyadi Semarang	In Class With Tunjung Tamarin Rahmadani Et Al. (2024) Highlights The Practice At Sd Supriyadi Semarang Which Has Integrated Technology Such As Qr Codes, Smartphones, And Digital Content Into Daily Learning. This Has Been Proven To Be Able To Improve Students' Digital Literacy Skills. In Addition, Students Are Not Only

Consumers Of Information, But Also Educational Creators.

6.	Heza Aqil Siroj Et Al., Year 2022	The Effect Of Digital Literacy On The Reading Interest Of Grade V Students At Sdn 1 Dasa Tapen For The 2021/2022 Academic Year	Research Conducted By Siroj Et Al. (2022) Found That Digital Literacy Has A Significant Influence On Increasing Students' Reading Interest At The Elementary School Level. In A Study Conducted At Sdn 1 Dasa Tapen, The Use Of Online Media As A Literacy Tool Showed An Increase In Reading Interest In Grade V Students By 79.5%. These Results Confirm That The Integration Of Digital Technology In Literacy Programs In Schools Is Able To Increase Students' Motivation In Reading And Enrich Their Access To Various Sources Of Information.
7.	Intan Purnama Dewi Et Al., Year 2024	Development Of Augmented Reality-Based Learning Media To Help Read Comprehension In Grade Iv Sd Negri 1 Langsa	Dewi Et Al. (2024) Succeeded In Developing Augmented Reality (Ar)-Based Learning Media Focused On Improving Reading Comprehension Of Grade Iv Elementary School Students. The Resulting Media Product Is Considered Very Feasible With A Media Validation Rate Of 98.43%, Which Shows That Ar-Based Technology Can Provide Students With A More Realistic Visualization Learning Experience, Increase Their Interest In Reading, And Help The Process Of Understanding Reading Materials In A More In-Depth And Enjoyable Manner.
8.	Annisa Dzikri Robbia And Husnul Fuadi, Year 2020	Development Of Interactive Multimedia Skills For Science Learning To Improve Students' Science Literacy In The 21st Century	Robbia & Fuadi (2020) Emphasized The Importance Of Using Interactive Multimedia In Learning, Especially In Improving Students' Science Literacy In The 21st Century. Through The Use Of Technologies Such As Digital Animation, Audio-Visual, And Computer-Based Simulations, Students Not Only Gain A Stronger Understanding Of Scientific Concepts, But Also Help In Developing Critical And Analytical Thinking Skills, Which Are Demanded In The World Of Modern Education Based On Information Technology.
9.	Rafika Dian Rahmawati Et Al., Year 2024	Analysis Of The Effectiveness Of Digital Technology Utilization Of Mathematics Learning Process At The Elementary School Level	In A Study Conducted By Rahmawati Et Al. (2024), It Was Found That The Use Of Interactive Applications And Educational Games In Mathematics Learning At The Elementary School Level Was Able To Increase Students' Active Involvement In The Learning Process. Not Only Does It Help Improve Students' Critical Thinking Skills, But It Is Also Able To Make Learning More Fun, Creative, And Adaptive To Various Student Learning Styles, Thus Having A Positive Impact On Overall Learning Outcomes.

10. Wening Estiningjati Et Al., Year 2024	The Utilization Of Technology In Education To Improve Numeracy Literacy In Elementary Schools And Create A Quality Independent Curriculum	Estiningjati Et Al. (2024) In Their Research Results Presented At A National Seminar, Stated That The Optimal Use Of Digital Technology Is Able To Strengthen The Numeracy Literacy Of Elementary School Students. They Highlighted That Innovations In The Use Of Technology, Such As Online-Based Numeracy Applications And Adaptive Learning Platforms, Are In Line With The Principles Of The Independent Curriculum Which Emphasizes Context-Based Learning And Differentiation. The Application Of This Technology Is Believed To Be Able To Develop Students' Logical Thinking And Problem-Solving Skills More Effectively.
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3.1.1. Results and Discussion 3

From several studies that have been studied, it shows that the use of technology in the learning process has a positive impact overall. Technology is able to bridge the limitations of access in reading materials. Learning that utilizes digital media can help students to be more interested in reading, understanding information in depth, and fostering a critical and creative attitude. In addition, it makes the learning process more interesting and adaptive to individual needs.

The use of technology in learning has a great influence on the process of improving literacy of elementary school students. Technology such as e-books, reading applications, and interactive games are able to provide interesting and fun learning for students. This is evidenced by research by Dian Luthfiyati et al. (2024), where the use of digital media such as Kahoot, e-books, and digital articles can increase students' literacy skills by up to 25%. In addition, students also feel more confident in reading digital texts, while teachers feel helped by the presence of technological media in delivering material.

In other words, technology is not only a tool, but also an effective means to develop students' literacy skills in digital form. This strengthens the opinion that the integration of technology in learning is a strategic step in answering the challenge of low interest in reading and understanding texts among elementary school students.

Various types of technology have proven to be effective in supporting literacy learning. One example is the "Let's Read" application, as researched by Nurhabibah et al. (2023). This application has been proven to be able to significantly improve the reading ability of 2nd grade elementary school students. This app is effective because it provides content that is engaging, accessible, and appropriate to the child's developmental level.

In addition to these applications, the use of digital media in the form of structured literacy activities has also proven to be effective. Irma Sary and Zulfan Mazaimi (2023) stated that digital literacy activities that are carried out routinely before learning begins (through the habituation, development, and learning stages) can form students who are used to accessing information independently and critically.

In the field of science literacy, Sepling Paling and Elisabet Ida Suparyono (2024) show that technology such as educational videos and virtual simulations can make it easier for students to understand science concepts. This digital media makes learning more personalized and interactive, and helps students connect the material with real life.

Other technologies used are QR codes, smartphones, and digital media in daily learning activities such as those carried out at SD Supriyadi Semarang. Research by Tunjung Tamarin Rahmadani et al. (2024) shows that students are not only able to access information, but also able to create educational content. This shows that technology-supported learning can increase students' literacy as well as creativity.

Research conducted by Heza Aqil Siroj et al. (2022) strengthens that digital literacy plays a very important role in increasing students' interest in reading. With the integration of online media in the

learning process at SDN 1 Dasan Tapen, there was an increase in the reading interest of grade V students by 79.5%. This shows that technology is able to expand students' access to reading resources and increase their motivation to read, thereby enriching the literacy skills needed in the modern world.

In addition, the use of Augmented Reality (AR)-based technology in learning also has a positive impact, as stated by Intan Purnama Dewi et al. (2024). The AR media developed has proven to be very feasible to use with a validation rate of 98.43%. This technology helps increase students' interest in reading and deepen their understanding of the material, through a more realistic and interactive visualization learning experience.

In the realm of science literacy, Robbia and Fuadi (2020) emphasized the importance of interactive multimedia. Through digital animation, audio-visual, and computer simulations, students can develop an understanding of science concepts as well as critical and analytical thinking skills. This shows that the use of interactive multimedia not only supports material mastery, but also hone the high-level thinking skills that are important in the 21st century.

A study by Rafika Dian Rahmawati et al. (2024) also proves that digital technology, especially interactive applications and educational games, is able to increase student involvement in mathematics learning in elementary school. Not only does it help students in critical thinking, but it also makes the learning process more fun, creative, and adaptive to various learning styles. This positive impact contributes to the overall improvement of student learning outcomes.

Finally, research by Wening Estiningjati et al. (2024) shows that the use of digital technology is very effective in strengthening numeracy literacy at the elementary school level. The innovation of using online-based numeracy applications and adaptive platforms is in accordance with the principles of the Independent Curriculum, which emphasizes context-based learning and differentiation. This is able to develop students' logical thinking skills and problem-solving, which is an important foundation in today's world of education.

Although technology has proven to bring many benefits, its application in learning also faces various challenges. Some of the main challenges found from the results of the study are the limited technology facilities, such as the availability of the internet, digital devices, and the lack of training for teachers. In addition, not all parents, teachers or students' environment support digital-based learning activities, especially in areas that are still technologically lagging behind.

To overcome these challenges, several solutions can be implemented. Schools and the government need to work together in providing regular and intensive training for teachers to improve their competence in the use of educational technology. In addition, it is necessary to provide supporting facilities such as school Wi-Fi connections, computer or tablet devices, and comfortable and adequate digital learning spaces. Close cooperation between schools and parents is also very important, so that students can continue to be accompanied in accessing and utilizing digital media at home. Finally, educational application developers need to innovate in creating learning content that is interesting, in accordance with the curriculum, and easy to use by teachers and students, so that technology is really an effective tool in improving student literacy.

By paying attention to these things, the use of technology in literacy learning in elementary schools can continue to be developed to achieve maximum results. Digital literacy activities carried out in a sustainable manner will form a young generation that is technologically literate and has strong literacy skills, both in terms of reading, critical thinking, and producing their own works digitally.

3.2. Conclusion

The use of technology in learning has been proven to have a positive impact on improving the literacy skills of elementary school students. Various forms of technology such as learning applications (such as Let's Read), digital media (such as e-books and educational videos), interactive games, to the use of QR codes and smartphones, have succeeded in helping students in increasing their interest in reading, text comprehension, and digital literacy in general.

The use of technology makes the learning process more interesting, fun, and in accordance with the needs of the times. Not only that, students also become more confident, active, and creative in accessing and producing information. This shows that technology is not only a learning aid, but also an important means in shaping a literate and digitally literate generation.

However, the application of technology in education still faces challenges, such as limited facilities, uneven internet access, and lack of training for teachers. Therefore, cooperation from various parties, including schools, governments, parents, and application developers, is needed so that technology can be used optimally and evenly.

With the right and sustainable approach, technology can be an effective solution in improving the literacy skills of elementary school students, as well as shaping the character of students who are critical, creative, and ready to face challenges in the digital era.

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