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Literatur Review: The use of Mobile Learning to Improve Critical Thinking Skills of Elementary School Students

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Abstract: The purpose of this sturi was to analyze the application of Mobile Learning to improve critical thinking skills of elementary school students. The method use is descriptive qualitative using literature study as a data collection technique. The use of mobile learning in science education at elementary schools can help students improve their critical thinking skills, facilitate teachers and students in the learning process, and utilize technology effectively in the learning context. Research results show that mobile learning can be used as a learning medium to improve students' analytical skills and increase their knowledge. By using mobile learning as a learning medium, students are able to use critical thinking techniques to analyze a situation, solve problems, and produce solutions, thereby drawing conclusions and resolving problems. Therefore, the use of mobile learning can be widely applied in science education at elementary schools to enhance students' learning experiences and provide them with the skills to use technology effectively and correctly.

Keywords: Critical Thinking Skills, Mobile Learning.

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A. INTRODUCTION

The Industrial Revolution 4.0 era has brought significant changes in the world of Education. With the rapid advancement of technology, students must have the ability to adapt to rapid and complex changes. This Industrial Revolution 4.0 is characterized by the rapid development of various sciences and technologies, thousands of digital content and various types of multi-platform applications flood human life. This situation has even become a familiar thing for most people, where technological developments have entered various lines of life. In this 4.0 revolution era, technology is advancing at an incredible pace, keeping pace with human needs in various aspects of life (Suryanti, 2018).

The industry 4.0 era presents educational institutions with a unique opportunity to foster a highly skilled and competent workforce. With unparalleled access to information, students can engage in virtual learning and seamlessly connect with various platforms. The Education 4.0 paradigm promotes the development of personalized learning approaches, student autonomy, and self-directed knowledge acquisition, ultimately leading to a more effective learning experience (Teknowijoyo & Marpelina, 2021).

In the 21st century, mobile learning are extremely useful for supporting the learning process, making it unavoidable that school-age children typically own a mobile device or

gadget, which is often provided by their parents. However, this cannot be separated from parental supervision, especially when accessing the internet. Mobile learning greatly facilitate users in receiving information. Nevertheless, excessive use of mobile devices can have negative impacts on the development of school-age children. Children who constantly use mobile devices as a means of playing can become addicted to them, making it their primary daily activity (Nuraeni, 2023).

Mobile learning is a learning approach that emerges from the evolution of educational technology (McQuiggan et al., 2015). Mobile learning is an extension of e-learning; mobile learning is defined as e-learning through mobile computing devices. The mobile devices referred to are small portable devices or small computing devices such as smartphones, tablets, Personal Digital Assistants (PDAs), and other handheld device (Bukharev & Altaher, 2017).

The most popular mobile learning platform in Indonesia currently is Android-based mobile learning. Android is a software platform and Linux-based operating system designed for touchscreen mobile devices such as smartphones and tablet computers, developed by Google and later by the Open Handset Alliance. Android provides an open platform for developers to create their own applications (Yudhanto & Wijayanto, 2017).

However, the use of mobile learning not only has negative impacts but also positive ones. The positive impacts include mobile devices serving as a learning medium to stimulate children's development (Ningsih & Shanie, 2023). Mobile learning become a means of learning media that promotes effectiveness and efficiency in learning activities. Another positive aspect of using mobile learning is that they provide easy access to information and foster creativity through various creative and challenging games for children, such as enhancing knowledge through examples of questions, images, videos, or tutorials that support children's learning (Novitasari, 2019).

The 4C skills are necessary for students to succeed in the 21st century (Wagner, 2008). These skills include communication, collaboration, critical thinking, and creativity. Therefore, in this era, students are required to master various skills, one of which is critical thinking. Critical thinking is the ability to analyze information, evaluate arguments, and make logical and rational decisions. This critical thinking skill is crucial in the industry 4.0 era because students must be able to process complex information and make appropriate decisions in uncertain situations. Critical thinking is an integral part of the learning process. Critical thinking is necessary for students to provide explanations, build skills, summarize, make explanations, and determine strategies in problem-solving (Salim & Aryuni, 2022). Critical thinking helps students understand the material and improves student learning outcomes (Muntari et al., 2021). In the context of education, critical thinking is essential to help students solve problems and make informed decisions in everyday life (Zubaidah, 2017).

In Indonesia, students are generally considered to have low critical thinking skills. The low level of critical thinking skills among students can be seen in their inability to provide clear arguments when asked by teachers, and their tendency to simply read from books without adding their own analysis. Critical thinking skills will undoubtedly have a significant impact on students' cognitive development and adaptability. Therefore, students'

critical thinking skills are a crucial issue that needs to be addressed in the digital era on existing problems, field observations also reveal that elementary school students often struggle to solve learning-related problems, have difficulty analyzing information effectively, and struggle with high-level thinking questions, and tend to be passive in the learning process (Lidiawati & Aurelia, 2023).

Several studies suggest that critical thinking skills are essential in the education world of the 4.0 era. Critical thinking skills are crucial for students to prepare for global challenges, where education can create a society with quality and excellence in education for the future (Prasasti & Anas, 2023). With the advent of the 4.0 industrial era, students often use technology, such as mobile devices, to access information and play, thereby reducing learning activities and student abilities. This condition undoubtedly affects students' critical thinking skills (Ningsih & Shanie, 2023). Students who can apply critical thinking techniques can examine a situation, solve or generate solutions, and draw conclusions to solve problems (Handayani et al., 2021). Therefore, students are expected to possess critical thinking skills to analyze and solve problems that should not have a negative impact on themselves.

The purpose of this study is to analyze the effectiveness of applying mobile learning in improving the critical thinking skills of elementary school students. Through this learning medium, students are expected to improve their critical thinking skills, facilitate teachers and students in the learning process, and effectively utilize technology in the context of learning.

B. METHOD

This research uses a descriptive qualitative method with a literature study as a data collection technique. The descriptive qualitative method is used to gain an in-depth understanding of mobile learning to improve critical thinking skills of elementary school students. The descriptive qualitative method is used to describe a phenomenon or event in detail and in-depth by paying attention to the context and related situations (Creswell, 2019). In this method, the sources used by researchers are obtained from scientific journals, books, and other documents. The researcher employed a systematic literature review, using a State of the Art Matrix table to categorize and synthesize relevant articles pertaining to the research topic. Data analysis was carried out by studying and reviewing the results of previous studies and related documents to gain a deeper understanding of mobile learning to improve critical thinking skills of elementary school students. Thus, the descriptive qualitative method using a literature study is the right method to answer the problem formulation in this research.

C. RESULTS AND DISCUSSION

Based on the literature review, which combines previous studies, it is evident that mobile learning can enhance 4C skills, including critical thinking. Darmawan explains that mobile learning is an alternative approach that enables learning services to be conducted anywhere and anytime (Darmawan, 2012:15). Moreover, mobile learning provides a platform for teachers and students to interact during the learning process, regardless of proximity. This encourages student participation in educational guidance, which in turn enhances the

learning process and develops critical thinking skills associated with learning activities (Majid et al., 2020).

Table 1. Collection of Articles to Analyze

No	Name & Year	Title	Result
1	Sari & Ma'rifah, (2020)	Development Of Mobile Learning Lkpd Based on Android with Pbl to Improve Critical Thinking on Environmental Materials	The Android-based mobile learning LKPD with PBL is a viable tool for fostering critical thinking skills among students.
2	Susanto, (2021)	Developing Nearpod E-Media through the Discovery Model to Enhance Critical Thinking Skills of Elementary School Students	The implementation of Nearpod electronic media through the Discovery model resulted in an improvement in students' critical thinking skills, as evidenced by a post-test average score of 79.74. Prior to using this media, the pre-test average score was 65.18 (Susanto, 2021). This indicates a 42% increase in students' critical thinking skills.
3	Pratiwi & Mawardi, (2022)	The Application of Audio-Visual Aided Problem-Based Learning Model to Enhance Critical Thinking Skills and Student Learning Outcome	The critical thinking skills and learning outcomes of fourth-grade students at SD Negeri 1 Mangunsari can be improved through the application of problem-based learning models assisted by audio-visual media. This is evidenced by a 48% increase in students' critical reasoning abilities
4	Twiningsih, A (2022)	The Use of iSpring Suite Mobile Learning-Based Media in Mathematics Learning to Improve Critical Thinking Skills of Third-Grade Elementary School Students	The use of iSpring Suite media in the mathematics curriculum for third-grade elementary school students, particularly in number recognition, has an impact on the development of students' critical thinking skills. This is supported by a 42% increase in the average assessment score of students' critical thinking skills before and after using the media.
5	Andriani & Ramadani (2022)	The Effect of Using Android-Based Augmented Reality Media on Critical Thinking Skills of Elementary School Students	Augmented Reality can make abstract science concepts concrete. AR can bring virtual worlds to life, making it real, thus enabling students to discover concepts independently through the application of AR in science learning. Augmented Reality media has a 75% influence on improving critical thinking skills.

No	Name & Year	Title	Result
6	Ma'rifah & Mawardi (2022)	Enhancing Critical Thinking Skills of Students Using Hyflex Learning Assisted by Wordwall	Hyflex Learning assisted by Wordwall is capable of improving students' critical thinking skills by 34%.
7	Rahayu et al., (2023)	Literature Study on the Impact of Gadget Use on Cognitive Development in School-Age Children	The result of this literature study review is that gadgets have a significant impact on the cognitive development of school-age children, both positively and negatively. Lack of parental supervision can lead to negative impacts on cognitive development, whereas proper use of gadgets can have positive effects, such as enhancing cognitive abilities in school-age children
8	Setianingsih et al., (2024)	Development of Web-Based Learning Media (Google Sites) to Improve Critical Thinking Skills and Digital Literacy of Fifth-Grade Elementary School Students	The development of web-based media (Google Sites) makes student activities in learning categorized as very active, and there is a significant improvement in students' critical thinking skills.
9	Ningsih & Shanie, (2023)	The Effect of Gadget Use on Critical Thinking Abilities of Elementary School Students	The use of gadgets is one of the factors that influence the critical thinking abilities of sixth-grade students at Madrasah Ibtidaiyah Nashrul Fajar Meteseh Tembalan.

In the 21st century, students are drawn to experiential learning delivered through interactive digital media. The use of mobile learning digital media can be tailored to individual capacities in the learning process. The use of mobile learning is one of the solutions that can be employed in learning to enhance students' critical thinking skills in analyzing problems that occur in the 21st century. It is known that the critical thinking skills of students through the results of PISA (Programme for International Student Assessment) data in 2018, Indonesia ranks 71st out of 78 participating countries with an average score of 396 in the field of science (OECD, 2019). This indicates that the critical thinking skills of students are still considered low. Therefore, students' critical thinking skills are highly required in this Industrial Revolution 4.0 era.

From various literature reviews, it is evident that digital media can enhance critical thinking skills in elementary school students, and the options are diverse. A relevant literature review highlights the use of Nearpod electronic media as a digital learning platform for delivering learning materials and assessments. This platform is utilized in the implementation of the Discovery learning model, which aims to improve students' critical thinking skills through interactive learning devices.

Moreover, the LKPD mobile learning product, based on Android and incorporating the PBL model, enables learning to take place anywhere and at any time, with a focus on ecological studies. The PBL method also relies on learning devices, including LKPD, which has been shown to be highly effective in promoting students' critical thinking skills (Abdurrahman, 2019).

The iSpring Suite is a mobile learning-based educational media built on Microsoft PowerPoint software, classified as an interactive multimedia media (Twiningsih, 2022). It produces a media that can be converted into an application, accessible via Android, both online and offline, making it easily accessible for students anywhere, anytime. iSpring media facilitates the transmission of learning messages through multimedia elements such as images, audio, and video, yielding an engaging and interactive learning media for students. By leveraging iSpring Suite, teachers can distill learning materials into concise summaries and generate quizzes for evaluating student learning. The iSpring media platform can provide an additional instrument for assessment and evaluation of learning, as well as summarizing learning materials.

Augmented Reality (AR) media is an innovative technology that acts as a supplementary tool in the learning process. This technology offers the ability to combine virtual objects with the physical world, allowing users to experience a more immersive interaction by integrating these digital objects into their real-world environment (Andriani & Ramadani, 2022). In this way, the media provides a great opportunity for students to better understand the subject matter they are studying. Students can directly observe the teacher's explanations in a more vivid and dynamic visual form, enabling them to observe the taught concepts in a more engaging and easily understandable way. This can increase student engagement and understanding of the subject matter being taught.

This media provides elementary school students with the opportunity not only to see, but also to hear the presented material in an engaging and relevant way. With an interactive approach, this media is designed to capture students' attention, making it easier for them to understand and enjoy the learning process. This helps create a more enjoyable and motivating learning experience, encouraging students to be more actively engaged in learning. The implementation of Augmented Reality media can enhance the critical thinking skills of 5th-grade elementary school students.

Web-based learning media (Google Sites) is one of the learning media created using technology, with the advantage of being able to store learning materials in various formats, including text, images, videos, audio, and audiovisual. Google Sites is one of Google's free products that allows users to create structured websites with attractive accessories easily, without requiring programming knowledge, making it accessible to beginner users (Kurniawan & Sanjaya, 2010). Google Sites functions as a platform that enables users to upload and share various types of learning content, such as text, images, videos, and audio (Setianingsih et al., 2024). This content can be accessed online through the internet, making it easy for students to access learning materials anytime and anywhere. Users can access Google Sites using various devices, such as tablets, laptops, and smartphones, providing

flexibility in the learning process and enabling a more interactive and accessible learning experience for all parties (Yanto et al., 2023).

Wordwall media is one of the media that can help elementary school students, specifically in improving their critical thinking skills (Ma'rifah & Mawardi, 2022). Wordwall can be conceptualized as a web-based application with the ability to generate engaging quizzes. This web application is suitable for developing and evaluating learning assessments. The educational games developed can be used for all subjects. By utilizing this media, teachers can create a more engaging and dynamic learning environment, preventing students from feeling bored or losing interest in the material being taught. During gameplay, this media enables teachers to convey information in a more interactive and enjoyable way, which in turn can keep students' attention focused and increase their engagement in the learning process. As a result, learning becomes more varied and enjoyable, helping students to better understand the material being presented.

Based on the summary of several literature reviews above, the researcher can conclude that mobile learning-based learning media has several effects on improving students' critical thinking skills. Critical thinking skills in students can be fostered through the use of various learning media in the learning process. In today's technological era of the 21st century, numerous students are adept at utilizing mobile learning. Nevertheless, this research reveals that mobile learning has a positive effect on enhancing students' critical thinking skills. A range of mobile learning-based media forms are employed and developed in elementary schools to improve students' critical thinking abilities.

D. CONCLUSIONS AND SUGGESTIONS

Critical thinking skills are one of the most essential skills that students should possess, as it enables them to solve various problems encountered in everyday life. This skill helps students analyze, evaluate, and make informed decisions based on available information. In the context of learning, to develop critical thinking skills, effective tools or media are required to support the learning process optimally. One of the media that can be used for this purpose is digital media. Digital media, which utilizes technology, information, and communication, has proven to have numerous benefits in enhancing the learning process. The use of digital media in learning can accelerate the achievement of learning objectives by increasing effectiveness and efficiency in delivering material. Moreover, digital media also has a greater appeal to students, making them more engaged and active in the learning process. One of the advantages of digital media is its ability to simplify complex or abstract material, enabling students to better understand concepts that were previously difficult to grasp.

This, in turn, supports a deeper understanding of the material being taught. Furthermore, the use of digital media also plays a role in developing 4C skills, which include critical thinking, communication, collaboration, and creativity. One of the most crucial aspects of 4C skills is critical thinking itself. Through the use of digital media, students are given the opportunity to explore various sources of information, analyze data, and make decisions based on their understanding, ultimately enhancing their critical thinking skills. Thus, digital

media is not just a supplementary tool in learning, but also a vital means of honing essential skills required by students in the real world. Various forms of technology-based learning media that can be used in the learning process to improve students' critical thinking skills include mobile learning, Google Sites, augmented reality, iSpring media, Nearpod, and Wordwall.

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