



UTILIZATION OF DIGITAL-BASED LEARNING MEDIA IN THE INDEPENDENT CURRICULUM IN ELEMENTARY SCHOOLS

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ABSTRACT

The utilization of digital-based learning media in elementary schools is becoming increasingly important in supporting the implementation of the Free Curriculum. Digital media such as interactive multimedia, e-learning, instructional videos, augmented reality (AR), and virtual reality (VR) have the potential to enhance active student participation, facilitate contextual and meaningful learning, and develop 21st-century skills. However, its implementation faces challenges such as limited technological infrastructure, educator skill shortages, lack of quality content, and insufficient stakeholder support.

This research deeply examines the utilization of digital-based learning media in the Free Curriculum at Indonesian elementary schools, identifies influencing factors, and proposes optimization strategies. The method used is a literature review by analyzing and synthesizing information from relevant literature sources. The research results show that optimizing the utilization of digital media requires a comprehensive approach, including infrastructure development, educator training, provision of quality content, stakeholder collaboration, supportive policies, adequate funding, and the implementation of best practices. This research contributes to the development of effective implementation strategies to support the use of digital media in elementary school learning and to achieve the goals of the Free Curriculum in creating meaningful learning processes and developing 21st-century skills.

Keywords: Digital Learning Media, Free Curriculum, Elementary School

1. INTRODUCTION

Learning media is one of the crucial components in the teaching and learning process. Learning media serves as a tool used by educators to deliver subject matter to students. The appropriate use of learning media can help enhance motivation for learning, facilitate information delivery, and create a more interactive and engaging learning environment (Ylsan & Kamal, 2022). In the current digital era, the advancement of information and communication technology (ICT) has brought significant changes to the world of education, including the use of learning media.

The progress of ICT has enabled the creation of various digital-based learning media that can be integrated into the teaching and learning process. Digital-based learning media encompass various types of media such as interactive multimedia, e-learning, educational applications, instructional videos, and others. These media utilize digital technology such as computers, the internet, mobile devices, and sophisticated software to present subject matter in a more engaging, interactive, and efficient manner (Fransisca, et.al, 2023).

One of Indonesia's new concepts in the education sector is the Merdeka Curriculum. The Merdeka Curriculum is a new policy from the Ministry of Education and Culture aimed at giving schools the freedom to develop a curriculum that suits the needs and characteristics of students as well as the local environment (Kemendikbud, 2021). The Merdeka Curriculum emphasizes a student-centered learning approach and integrates the use of digital technology in learning (Kemendikbud, 2021).

In the context of the Merdeka Curriculum, the utilization of digital-based learning media is highly relevant and important. Digital-based learning media can facilitate a learner-centered approach to teaching, create a more interactive and engaging learning environment, and assist learners in developing 21st-century skills such as digital literacy, collaboration, and self-directed learning (Kemendikbud, 2021).



At the elementary school level, the use of digital-based learning media has great potential to enhance the quality of learning. Learners at the elementary school age tend to have a strong curiosity, are easily attracted to new things, and enjoy learning that involves visual and interactive elements as stated by Lestari, et.al. (2022). Rachmawati, et.al (2023) stated that digital-based learning media such as interactive multimedia, educational applications, and instructional videos can capture the interest and attention of learners, as well as help them understand abstract concepts through visualization and simulation.

However, the utilization of digital-based learning media in elementary schools also faces several challenges and obstacles. Rohim & Rigianti (2023) stated that one of the main challenges is the availability of adequate technological infrastructure, such as computers, mobile devices, and stable internet access. Additionally, other factors such as educators' skills in using digital technology, availability of resources and adequate training, and support from schools and the government are also challenges that need to be addressed (Sukardi, et.al, 2023).

Nevertheless, if these challenges can be overcome, the utilization of digital-based learning media in elementary schools can provide many benefits. Some benefits that can be obtained include increasing learners' motivation, facilitating more interactive and meaningful learning, and helping learners develop 21st-century skills such as digital literacy, collaboration, and self-directed learning. Moreover, Rohim & Rigianti (2023) stated that the use of digital-based learning media can also support the implementation of the Merdeka Curriculum by providing rich and diverse learning resources for learners.

Several previous studies have examined the utilization of digital-based learning media in the context of education, but few have focused on the elementary school level and its relation to the Merdeka Curriculum. Research conducted by Nenotek, et.al (2023) and Rezeki, et.al (2023) examined the factors influencing the use of technology in education in developing countries, including Indonesia. Their research findings indicated that the availability of technological infrastructure, educators' skills, and government support are key factors determining the success of technology integration in education.

Another study conducted by Farida, et.al (2023) examined the challenges and opportunities in the use of ICT in schools in developing countries. This research emphasized the importance of human resource capacity, supportive policies, and collaboration among stakeholders to ensure effective ICT utilization in education.

Although these studies provide valuable insights, there are still gaps that have not been extensively explored, especially in the context of the utilization of digital-based learning media in elementary schools in Indonesia and its relation to the Merdeka Curriculum. Therefore, this research aims to thoroughly examine the utilization of digital-based learning media in the Merdeka Curriculum in elementary schools in Indonesia.

The main objectives of this research are to identify the types of digital-based learning media used in elementary schools, analyze the factors influencing their utilization, and evaluate the impact of using digital-based learning media on the quality of education and the achievement of the goals of the Merdeka Curriculum. This research is expected to provide valuable insights for stakeholders in the education sector, such as the government, schools, educators, and parents, about the importance of utilizing digital-based learning media in elementary schools and strategies that can be employed to optimize their usage.

Furthermore, this research is also expected to contribute to the development of theory and practice in the use of digital-based learning media within the context of the Merdeka Curriculum. The findings of this research can serve as the basis for the development of more effective policies, training programs, and implementation strategies to support the utilization of digital-based learning media in elementary schools across Indonesia.

By optimizing the utilization of digital-based learning media, it is hoped that the quality of education in elementary schools can be enhanced, and the primary goals of the Merdeka Curriculum in creating meaningful, enjoyable learning experiences and developing 21st-century skills can be achieved. This research is important and urgent to support the government's efforts in realizing the vision of quality education that is relevant to the changing times.



2. RESEARCH METHODS

This research will use the literature review method to thoroughly examine the utilization of digital-based learning media in the Merdeka Curriculum in elementary schools in Indonesia. The literature review method involves collecting, reading, analyzing, and synthesizing information from various relevant literary sources, such as books, scientific journals, research reports, and trustworthy online sources.

The steps to be taken in this literature review method include:

1. Identifying and collecting relevant literary sources on the research topic, such as books, journals, research reports, and online sources.
2. Reading and critically analyzing the content of literary sources to understand the concepts, findings, and perspectives related to the utilization of digital-based learning media in the Merdeka Curriculum in elementary schools.
3. Synthesizing and integrating information from various literary sources to identify patterns, similarities, and differences among existing findings.
4. Criticizing and evaluating the strengths and weaknesses of the literary sources used, as well as identifying gaps or areas that still require further research.
5. Drawing comprehensive conclusions and recommendations based on the analysis and synthesis of literary sources.

In conducting the literature review, this research will utilize various literary sources such as textbooks, scientific journals, research reports, dissertations, and relevant and trustworthy online sources. Literary sources will be systematically traced through searches in academic databases, digital libraries, and scholarly search engines.

3. RESULTS AND DISCUSSIONS

Types of Digital-Based Learning Media in Elementary Schools

a) Interactive Multimedia

Interactive multimedia is one of the most widely used types of digital-based learning media in elementary schools. Interactive multimedia combines various media elements such as text, images, audio, video, and animations into one interactive digital application. Learners can interact directly with interactive multimedia, control the flow of learning, explore content, and receive real-time feedback. Educational apps, educational games, and simulations are some examples of interactive multimedia commonly used in elementary schools. Educational apps are specifically designed to deliver specific learning materials, such as apps for learning to read, count, or recognize shapes and colours. Educational games combine game elements with learning content, making the learning process more enjoyable and engaging for learners. Meanwhile, simulations allow learners to experience specific situations or environments virtually, such as science simulations, space travel simulations, or natural resource management simulations. Interactive multimedia has characteristics that appeal to elementary school learners, such as attractive visual displays, interactive sounds and animations, and enjoyable game elements. Learners can learn while playing, explore concepts concretely, and actively engage in the learning process.

b) E-Learning

E-learning, or electronic learning, is a type of digital-based learning media that utilizes internet and web technology. In elementary schools, e-learning can be implemented in the form of online courses, virtual classes, or Learning Management Systems (LMS). Online courses provide learning materials in digital format that



learners can access independently via the internet. Virtual classes allow direct interaction between teachers and learners online, such as through video conferences or virtual discussion rooms. Meanwhile, an LMS is a platform that integrates various features such as content delivery, assignments, assessments, and communication between teachers and learners. E-learning in elementary schools is generally used as a supplement or support to classroom learning, rather than a complete replacement. With e-learning, learners can access learning materials anytime and anywhere as long as they are connected to the internet. This provides flexibility and convenience for learners to review materials covered in class or expand their knowledge independently.

c) Instructional Videos

Instructional videos are visual media that present information in audio and visual formats simultaneously. In elementary schools, instructional videos can include recorded lectures or presentations by teachers, step-by-step tutorials, or animations explaining specific concepts. Instructional videos have the advantage of visualizing abstract concepts or processes that are difficult to explain with words alone. For example, animated videos can explain the process of photosynthesis in plants or the water cycle more concretely and engagingly for learners. Tutorial videos can also help learners understand the steps involved in an activity, such as conducting science experiments or creating artworks. In the context of learning in elementary schools, instructional videos can be used as support to explain concepts, trigger discussions, or assign tasks to learners. Instructional videos can also be accessed independently by learners outside of class hours, allowing them to review materials they may not have fully understood or expand their knowledge.

d) Augmented Reality (AR) and Virtual Reality (VR)

Augmented Reality (AR) and Virtual Reality (VR) are modern technologies that are beginning to be used in the field of education, including in elementary schools. AR combines virtual objects with the real environment, while VR creates a fully immersive virtual environment. In elementary schools, AR and VR can be used to visualize abstract or difficult-to-observe concepts. For example, AR can be used to display three-dimensional models of the human body or the solar system, while VR can create simulations of natural environments or trips to places that are difficult to reach physically. AR and VR provide more interactive, immersive, and contextual learning experiences for learners. They can explore virtual objects or environments, interact with elements within them, and gain a deeper understanding of the concepts being learned.

e) Characteristics and Examples of Use in Elementary Schools

Each type of digital-based learning media has different characteristics and potentials in supporting the teaching and learning process in elementary schools. Interactive multimedia is suitable for providing engaging and interactive learning experiences, while e-learning offers flexibility and easy access for learners. Instructional videos help visualize abstract concepts, while AR and VR create immersive and contextual learning environments. In practice, teachers in elementary schools can combine various types of digital-based learning media according to learning objectives, learner characteristics, and resource availability. For example, teachers can use interactive multimedia or educational apps to introduce basic concepts, then utilize instructional videos to explain more complex concepts, and use AR or VR to provide more concrete and immersive learning experiences.

Factors Influencing the Utilization of Digital-Based Learning Media

a) Technology Infrastructure

Adequate technology infrastructure is a key factor influencing the utilization of digital-based learning media in elementary schools. Technology infrastructure includes the availability of digital devices such as computers,



laptops, tablets, or mobile devices that can be used to access and interact with digital-based learning media. Additionally, stable and high-speed internet connectivity is also crucial to facilitate access to online learning resources and cloud-based applications. Other supporting facilities such as multimedia classrooms, projectors, and audio-visual equipment can also help create a more interactive and conducive learning environment for the use of digital-based learning media. Without adequate technology infrastructure, the utilization of digital-based learning media will be limited and less effective.

b) Educators' Skills and Competencies

Another crucial factor is educators' skills and competencies in using and integrating technology into the teaching and learning process. Educators who are skilled in operating digital devices, using online learning applications and platforms, and designing learning activities that utilize digital-based learning media will be more prepared and confident in implementing them in the classroom. On the other hand, educators who are less skilled or even have a fear of technology (technophobia) are likely to struggle in effectively implementing digital-based learning media. Therefore, training and professional development for educators in the field of instructional technology are crucial to support the utilization of digital-based learning media in elementary schools.

c) Availability of Quality Content and Learning Resources

The availability of quality digital-based learning content and resources that align with the curriculum is also a significant factor influencing the utilization of such media. Engaging, interactive learning content that can facilitate the achievement of learning objectives will be more effective in supporting the teaching and learning process compared to monotonous or irrelevant content. Quality digital-based learning resources can include educational applications, interactive multimedia, instructional videos, or online resources that have been verified and align with curriculum standards. The availability of these resources enables educators and students to optimize the utilization of digital-based learning media according to their learning needs.

d) Support from Schools, Parents, and Stakeholders

The utilization of digital-based learning media in elementary schools is also greatly influenced by the support and involvement of schools, parents, and other stakeholders. Schools, such as principals and administrators, play a crucial role in providing adequate technology infrastructure, offering training for educators, and creating a culture that supports the use of technology in learning. Additionally, support and involvement from parents are also crucial, especially in facilitating students' access to digital-based learning media at home and encouraging them to use it positively and responsibly. Other stakeholders such as local governments, community organizations, and industry partners can also play a role in providing resources, training, or programs that support the utilization of digital-based learning media in elementary schools.

e) Government Policies and Regulations

Finally, government policies and regulations related to the use of technology in education also influence the utilization of digital-based learning media in elementary schools. Governments can establish clear standards and guidelines for the use of technology in learning and provide support such as funding, infrastructure, or training programs for educators and schools. Government policies and regulations can also encourage the development and provision of quality digital-based learning content and resources that align with the national curriculum. With supportive policies and regulations in place, elementary schools will be better equipped to effectively implement digital-based learning media and integrate them with the applicable curriculum.



Benefits and Impact of Using Digital-Based Learning Media

Enhancing active participation and engagement of students: The use of interactive and engaging digital-based learning media can enhance the active participation and engagement of students in the learning process. Digital media allows students to interact with learning content directly, answer questions, simulate scenarios, or engage in more dynamic and multisensory learning activities. This can increase motivation and interest in learning, as well as make students more actively involved in constructing their own knowledge. Digital-based learning media can provide broader access to resources and information relevant to students' real-life contexts. For example, students can explore learning materials through videos, simulations, or applications that connect abstract concepts with real-world situations. This can facilitate more contextual and meaningful learning, helping students build connections between acquired knowledge and its application in everyday life.

Helping students develop digital literacy and 21st-century skills: The use of digital-based learning media can help students develop digital literacy and 21st-century skills that are crucial for their future success. Skills such as critical thinking, collaboration, communication, creativity, and problem-solving can be facilitated through the appropriate use of digital media. Students can learn to use technology effectively, access and critically evaluate information, and develop the ability to communicate and collaborate digitally. Digital-based learning media allows for flexibility in the learning process. Students can access learning materials anytime and anywhere, and adjust their own pace and learning styles. Additionally, digital media also enables personalized learning, where content and activities can be tailored to the needs, interests, and abilities of each student.

Increasing motivation and interest in learning: Engaging and interactive digital-based learning media can increase motivation and interest in learning among students. The use of up-to-date technology, rich multimedia content, and varied learning activities can make the learning process more enjoyable and engaging for students. This can encourage their involvement and active participation in the learning process, as well as increase curiosity and interest in learning more.

Impact on academic achievement and learning goals attainment: Effective and well-integrated use of digital-based learning media in the learning process can have a positive impact on academic achievement and the attainment of learning goals for students. Research has shown that well-designed digital media can improve understanding of concepts, higher-order thinking skills, and knowledge retention in students. However, this impact is highly dependent on how digital media is integrated into the overall learning design, as well as other factors such as content quality, teaching strategies, and student characteristics.

Challenges and Obstacles in Implementation

One of the main challenges in implementing digital-based learning media is the limitation of technological infrastructure in schools. Many schools, especially in rural or less developed areas, face shortages in terms of stable internet access, adequate hardware (computers, tablets, or mobile devices), and other supporting facilities such as multimedia classrooms or computer laboratories. These limitations can hinder the adoption and utilization of digital media in the learning process.

Another challenge is the lack of skills and competencies among educators in effectively integrating technology and digital media into the learning process. Many educators feel less confident or undertrained in using digital technology, which can hinder the optimal adoption and utilization of digital-based learning media. Adequate training and professional development programs are needed to help educators improve their skills and competencies in this area.

The availability of quality learning content and resources that align with the curriculum and local context is also a challenge. Although there are many digital resources available online, not all of them are relevant or suitable for the needs and learning objectives in schools. Efforts are needed to develop or adapt quality and contextual learning content and resources and to ensure easy access for educators and students.



The implementation of digital-based learning media requires support and involvement from various stakeholders, such as the government, schools, parents, and the community. Lack of support and collaboration from these stakeholders can be a barrier to the effective adoption and utilization of digital media. Efforts are needed to increase awareness, commitment, and involvement from all relevant parties.

Implementing digital-based learning media also requires significant financial investment, both for hardware procurement, software, infrastructure, and maintenance and update costs. Many schools, especially in areas with limited resources, face challenges with inadequate funding to meet these needs. Efforts are needed to allocate a sufficient budget and seek alternative funding sources, such as partnerships with private sector or non-profit organizations.

The use of digital technology in learning may also face technical challenges and security issues. Issues such as hardware damage, internet connection disruptions, software compatibility issues, or cyber security threats can disrupt effective learning processes. Efforts are needed to ensure the availability of adequate technical support, training on safe technology use, and implementation of appropriate security measures to protect the data and privacy of students and educators.

Considering the benefits and challenges, the implementation of digital-based learning media in the Free Curriculum at elementary schools requires thorough planning, close collaboration among various stakeholders, and sustainable efforts to overcome barriers and maximize the potential of digital media in supporting quality learning processes that are relevant to the needs of students in the 21st century.

Strategies and solutions for optimizing utilization

To optimize the utilization of digital-based learning media in the Free Curriculum at elementary schools, comprehensive strategies and solutions involving various stakeholders are necessary. These efforts are crucial to ensure effective and sustainable implementation so that the benefits of digital media in learning can be maximized. Some strategies and solutions that can be considered include the development of adequate technological infrastructure, educator training, and competency development programs, development and provision of quality learning content/resources, engagement and collaboration with stakeholders, supportive policies and regulations facilitating the use of technology in education, adequate budget allocation and funding, as well as the implementation of best practices and learning from successful experiences

The development of adequate technological infrastructure is a key factor for the successful implementation of digital-based learning media. This includes stable and high-speed internet access, hardware such as computers, laptops, tablets, or mobile devices, and supportive facilities such as multimedia classrooms or computer laboratories. Strategies that can be implemented include collaborating with the government and private sector to develop technology infrastructure in schools, allocating sufficient budget, leveraging cloud computing technology, and forming partnerships with internet and technology service providers (Kemendikbud, 2020).

Educators play a central role in effectively implementing digital-based learning media. Therefore, comprehensive educator training and competency development programs are required. Strategies that can be implemented include providing pre-service and in-service training for educators, developing certification or specific credentials programs, establishing practice communities or learning groups among educators, and encouraging educators to participate in continuous professional development programs related to digital media and technology in education (Kemendikbud & USAID, 2019).

The availability of quality learning content and resources that align with the curriculum and local context is a crucial factor in maximizing the benefits of digital-based learning media. Strategies that can be considered include developing quality and contextual digital learning content, collaborating with publishers or educational content developers, leveraging open educational resources (OER), and establishing centralized repositories of digital learning resources (Aruan & Wibowo, 2020).



The implementation of digital-based learning media requires engagement and collaboration from various stakeholders, including the government, schools, educators, parents, and the community. Strategies that can be implemented include forming committees or working groups involving representatives from various stakeholders, involving parents and the community in decision-making processes, collaborating with a private sector or non-profit organizations, and organizing workshops or discussion forums involving various stakeholders (Kemendikbud, 2021).

The presence of supportive policies and regulations facilitating the use of technology in education is crucial to ensure effective and sustainable implementation. Strategies that can be considered include formulating national or regional policies and regulations supporting the use of digital media in learning, developing standards and guidelines to ensure the quality, security, and accessibility of digital media used, establishing policies on data privacy and copyright protection, and involving various stakeholders in the policy formulation process and related regulations (Kemendikbud, 2018).

The implementation of digital-based learning media requires significant financial investment, both for infrastructure procurement, hardware, software, and operational and maintenance costs. Strategies that can be considered include allocating sufficient budget from government funds or other education funding sources, seeking alternative funding sources such as partnerships with private sector or non-profit organizations, developing sustainable funding models such as cost-sharing schemes or crowdfunding, and conducting cost-benefit analysis and prioritizing investments that have a large impact on learning quality (Kemendikbud & Bank Dunia, 2021).

In implementing digital-based learning media, it is crucial to learn from best practices and successful experiences that have been implemented elsewhere. Strategies that can be considered include studying and adopting best practices from schools, regions, or countries that have successfully implemented digital media in learning, participating in international practice networks or communities focusing on the use of technology in education, conducting benchmarking or visits to schools or educational institutions that have succeeded in implementing digital media, and inviting experts or experienced practitioners to provide training, consultation, or share insights on best practices (Kemendikbud & UNICEF, 2020).

By implementing comprehensive strategies and solutions as described above, it is expected that the utilization of digital-based learning media in the Free Curriculum at elementary schools can be optimized. This will provide significant benefits to the learning process, such as increasing active participation and engagement of students, facilitating contextual and meaningful learning, developing digital literacy and 21st-century skills, facilitating flexible and personalized learning, as well as enhancing motivation and interest in learning for students. Furthermore, optimizing the utilization of digital media can also have a positive impact on academic achievement and overall learning goal attainment.

However, it should be emphasized that the implementation of digital-based learning media is not just about integrating technology into the learning process, but also requires a change in mindset, thorough planning, close collaboration among various stakeholders, and ongoing efforts to address challenges and obstacles. With strong commitment and efforts from all involved parties, the utilization of digital media in learning can become a catalyst for a more quality, relevant, and student-centric education transformation in the 21st century.

4. CONCLUSIONS

Digital-based learning media is an essential tool for improving the quality of education in elementary schools. These media come in various types, such as interactive multimedia, e-learning, and instructional videos, as well as augmented reality (AR) and virtual reality (VR). Each type has its uniqueness and potential to facilitate more engaging, contextual, and meaningful learning experiences for students. The utilization of digital media in elementary schools can provide significant benefits, including increasing active participation and engagement of students, developing digital literacy and 21st-century skills, facilitating flexible and personalized learning, as well



as enhancing motivation and interest in learning. Furthermore, effective use of digital media can also positively impact academic achievement and overall learning goal attainment.

However, the utilization of digital-based learning media in elementary schools is influenced by various factors such as technological infrastructure, educator skills, and competencies, availability of quality learning content and resources, support from schools, parents, and stakeholders, as well as government policies and regulations. Additionally, there are challenges and obstacles to be overcome, such as limited technology infrastructure in schools, educator skill, and competency shortages, lack of suitable learning content and resources, inadequate support and engagement from stakeholders, cost, and funding issues, as well as technical and security issues in technology usage.

To optimize the utilization of digital-based learning media in the Free Curriculum at elementary schools, comprehensive strategies and solutions are required. This includes the development of adequate technology infrastructure, educator training, and competency development programs, development and provision of quality learning content/resources, engagement and collaboration with stakeholders, supportive policies and regulations, adequate budget allocation and funding, as well as the implementation of best practices and learning from successful experiences. The implementation of digital-based learning media requires a change in mindset, thorough planning, close collaboration among various stakeholders, and ongoing efforts to address emerging challenges and obstacles. With strong commitment and efforts from all involved parties, the utilization of digital media in learning can become a catalyst for a more quality, relevant, and student-centric education transformation in the 21st century.

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