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Digital Education Transformation 5.0 through Innovation Integration Science and Technology

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ABSTRAK

Digital Education 5.0 combines innovations in science and technology to create an effective, interactive, and relevant learning environment. This research aims to describe the role of Digital Education 5.0 transformation through the integration of science and technology innovations. The study employs a qualitative research method with a literature review approach. Data from relevant literature sources are utilized to gain an understanding of the concepts of Digital Education 5.0 and the integration of science and technology innovations in an educational context. The research findings indicate that Digital Education 5.0 provides new opportunities in learning and teaching. The integration of science and technology innovations creates a learning ecosystem based on advanced technologies such as artificial intelligence, machine learning, virtual reality, and the Internet of Things. This approach enhances student motivation, interaction, and participation. Moreover, the integration of science and technology innovations also encourages innovative teaching strategies such as flipped classrooms, blended learning, and personalized learning. Teachers can present engaging and relevant educational content and facilitate effective collaboration and communication between teachers and students. However, the transformation of Digital Education 5.0 also faces challenges. Sustained preparation is needed to equip teachers and students to master and utilize technology optimally. Privacy and security aspects of digital technology usage must also be considered. In conclusion, the transformation of Digital Education 5.0 through the integration of science and technology innovations enhances the quality of education. With advanced technology and innovative teaching strategies, Digital Education 5.0 creates an interactive, creative, and adaptive learning environment. Challenges in technology implementation need to be overcome for the full potential of Digital Education 5.0 to be realized.

1. Introduction

Amidst rapid developments in the digital realm, education is undergoing transformational changes to adapt to advances in science and technology. to adapt to advances in science and technology. Education can also broaden horizons and strengthen the ability to make smart and wise decisions [1]. smart and wise decisions [1]. Therefore, education must continue to develop

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and adapt to the times, especially in the digital era like now. Education in the 21st century century has undergone a transformation through the use of Science and Technology (IPTEK), which is increasingly advanced [2]. which is increasingly advanced[2]. By utilizing the latest technologies such as artificial intelligence, machine learning, virtual reality, and the Internet of Things, Digital Education 5.0 aims to optimize student engagement, encourage collaboration, and improve overall learning outcomes. overall learning outcomes. This research explores the role of Digital Education 5.0 in transforming the educational education landscape and the integration of science and technology innovations within this framework[3]. Through a qualitative research approach and an in-depth review of relevant literature, the study aims to provide an understanding of the opportunities and challenges offered by Digital Education 5.0 and its potential to improve the quality of education[4]. By embracing this transformational approach, educators can unlock a range of opportunities, Translated with DeepL.com (free version).diversity and equality in access to and use of technology.In addition, the transformation of education through science and technology also opens up opportunities to improve the quality of education and create new innovations in teaching and learning [6]. quality of education and create new innovations in teaching and learning [6]. For example, technology can be used to optimize personalized learning and enable more effective and efficient more effective and efficient teaching. In addition, technology can also be used to facilitate creative and collaborative learning that can strengthen students' ability to face future challenges [7]. face future challenges [7]. In this scientific work, we will discuss the transformation of education through Digital Education 5.0 and the challenges and opportunities faced. In this case, education in Indonesia is the main focus of the discussion, given the condition of education in Indonesia, which still needs to be improved [8]. which still needs to be improved [8]. Based on data from the Central Bureau of Statistics (BPS) in 2019, the level of education in Indonesia is still low, especially in remote and poorly populated areas. poor populations.There are 5 (five) previous studies that discuss education in the 21st century related to science and technology. related to science and technology, this previous research is a reference for this research in knowing the development of early childhood education, including the development of early childhood education including: Early research talks about shifts in the way of learning due to rapid developments in Science and Technology [9]. (SCIENCE AND TECHNOLOGY)[9]. The changes are characterized by modifications in curriculum, media, and technology. Research This research uses the literature study method, and the results show that education in the 21st era is a process that allows the development and empowerment of all the potential of participants. era is a process that enables the development and empowerment of all learners' potential to form better characters. learners to form a better character. The purpose of this second research is to explain thoroughly about STEM learning as an innovation in the learning process that can be applied in vocational education. learning process that can be applied in vocational education [10]. In this research, literature review method was used by referring to relevant references and research results, then continued with group discussion. The results showed that STEM learning has been successfully implemented both at home and abroad. This third research aims to shaping the character of human resources to improve in the 21st century [11]. In this research This analysis method uses literature review. The findings of the study show that character education in the 21st century has undergone a transformation from a traditional society to a society that has critical analytical skills and expertise in science and technology [12]. But However, the strong basis of character education in the 21st century is the values of religion, devotion to God Almighty and the noble values of the nation. religion, devotion to God Almighty and the noble values of the nation. Research objectives of this fourth study was to evaluate the psychological principles underlying curriculum development in the 21st century [13]. curriculum development in the 21st century era [13]. In this research, the literature study method was used to collect, analyze, process, and present books, journals, and texts related to the research topic as references in the form of a report. to the research topic as a reference in the form of a literature report. The result of the research showed that in developing curriculum, it is important to be based on psychological principles rather than relying solely on philosophy [14]. The purpose of this fifth research is to identify the learning skills needed in learning in the 21st century era and improve the quality of human resources. and improve the quality of human resources. In this research, the method used is descriptive qualitative with a literature study approach. From the research results, it can be concluded that in digital education 5.0, emphasis is placed on activities that train learners' skills with a focus on the learning process [15]. A number of previous studies have been conducted on education in the 21st century, and the results show that the rapid advancement of science and technology (Science and Technology) and The results show that the rapid advancement of science and technology (IPTEK) has resulted in a paradigm shift in learning. The change is characterized by changes in curriculum, media, and technology used [16]. It has been proven that STEM learning has been successfully implemented at home and abroad, so that it is able to improve critical thinking skills and foster student creativity [17]. This allows students to have a more maximized view of the future that is ahead of them [18]. in front of them [18]. Character education in the era of the 21st century is a transformation that transform society from a traditional culture to a society that thinks analytically and critically, and have skills in science and technology [19]. Nevertheless, character education still maintains religious values, faith, and devotion to God Almighty, as well as noble values. Almighty, as well as the noble values of the nation's culture [20]. Curriculum development today curriculum development today must be based on the principles of psychology rather than relying solely on philosophy, because digital education 5.0 emphasizes activities that train

learners' skills with a focus on the learning process [21]. Therefore, previous research can be used as reference to understand the development of early childhood education in the future. By Considering the findings of previous research, it is expected that curriculum development that is oriented towards oriented to the learning process and learner skills can be better directed in the future [22].

2. Literature Review

1. Definition and Concept of Digital Education 5.0

Digital Education 5.0 can be defined as an educational paradigm that combines information and communication technology (ICT) with modern science to create a sophisticated learning ecosystem. This includes the use of artificial intelligence (AI), Internet of Things (IoT), virtual reality (VR), and augmented reality (AR) in the learning process.

3. Methodology

In the research process, the author analyzed various articles accessed through the literature study method [23]. Through this method, the author can analyze what technologies are used in education and the impact of the development of science and technology.

used in education and the impact caused by the development of science and technology in education [24].. Thus, this research provides a broader understanding of how science and technology affects the digital 5.0 education field [25]. Through data collection and analysis from various literature sources, researchers can obtain deeper insight into the topic being researched [26]. In the context of this study, the use of The literature study method assists the author in identifying the technology used in education and its impact on the development of education in the digital era can be seen in Scheme 1. The shift in the learning paradigm of the 21st century is below.

4. Results and Discussion

In this study, we conducted a literature review of the concept of digital education 5.0 and educational transformation through science and technology. We analyze these concepts in context challenges faced by Digital Education 5.0, such as globalization, technological developments, and social change [27]. In addition, we also analyze the learning models that can be used to develop digital education 5.0 and a case study of the implementation of 21st century education in some countries[28].

The results of the study show that digital education 5.0 must undergo a transformation to facing the challenges of the present and the future. The transformation includes the development of Competency-oriented curriculum, the use of technology in the learning process, and development of 21st century skills such as collaboration, creativity, critical skills, and communication [29]. In addition, effective learning models for 21st century education include Proye-based learning integrated learning, and collaborative learning. Case studies The implementation of Digital Education 5.0 in several countries shows that these countries has successfully implemented 21st century education by using various strategies and approach [30]. The results of our research are consistent with the theories discussed in the literature review. We found that the concept of transforming education through science and technology is one of the solutions". Therefore, further research can be conducted to validate our findings in practice education. In addition, further research can also consider the student's perspective and Their experience in developing 21st century skills and how to strategize Learning can help them in the development of these skills. Deep In conclusion, the results of our research show that the transformation of education through science and technology and 21st century skills development is an important step in developing education Digital 5.0. Learning models such as project-based learning, integrated learning, and Collaborative learning can be used to develop 21st century skills. Result Our research has important implications for the development of curriculum and learning methods at the school level and can provide a view of how 21st century education can developed in various countries.

5. Conclusion

Based on the results of the research and discussion that has been carried out, it can be concluded that educational transformation through science and technology and skill development in the 21st century is a thing which is important in developing digital education 5.0. 21st century skills learning such as critical thinking skills, communication skills, teamwork skills, and Information and communication technology (ICT) skills can help students to cope with global challenges in the future. Development of curriculum-oriented learning methods on competencies and integrating 21st century skills in learning can improve learning effectiveness and assisting students in developing 21st century skills. The use of technology such as online learning and learning apps can also increase learning effectiveness and assisting students in developing 21st century skills.

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