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EMBRACING DIGITALIZATION: TRANSFORMING EDUCATION FOR THE 5.0 ERA

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ABSTRACT

In the evolution of time, humans continue to develop and adapt to their environment during that period. Throughout this evolutionary process, humans constantly create innovations to enhance their effectiveness and ease of living. One of the tools used by humans in this process of adaptation and change is technology. Technology brings convenience and efficiency to human life. The development of the digital world progresses dynamically, and its influence on society's lifestyle cannot be ignored. Therefore, this paper aims to explore the importance of digitization in education in facing the changes from the 4.0 revolution towards 5.0. This research employs qualitative descriptive research with a literature review method. Data collection techniques utilize Content Analysis obtained from various sources including scientific articles, government documents, mass media, books, and others deemed relevant to this study, which are then analyzed using policy research. The research findings indicate that the digitization of education in schools is important to meet several needs, including increasing the demand for knowledge, improving the quality of student learning, strengthening students' four abilities: creativity, communication, critical thinking, and collaboration, as well as supporting the government's "independent learning" program, which is not limited by space and time. The digitization of school education can be used as a tool to support virtual learning without diminishing the essence of delivering learning materials, through online platforms that can be used flexibly.

Keywords: *Education digitization, Technological innovations*

1. INTRODUCTION

Technology is a field of knowledge that is constantly evolving. Human curiosity drives technological development as if it were limitless. Technological progress impacts every aspect of life, facilitating the fulfillment of human needs, including clothing, food, shelter, and even bureaucracy, through technology. The continuous innovation in technology signifies that humanity has entered the digital era. The digital era is a period where every aspect of human life is simplified by the sophistication of digital systems.

The digitization of schools is a logical consequence of the changing times, necessitating adaptation to master knowledge and technology, as emphasized by Dewanti (2020). In this regard, the government has implemented a policy regarding the digitization of schools to support digital learning activities by providing teaching materials through networks for use by education stakeholders, including teachers, students, schools, and the community. The policy emphasizes the use of information technology tools such as computer tablets and learning portal as operational aids in school performance, with regulations referring to Ministry of Education and Culture Regulation number 31 of 2019 and Minister of Education and Culture Decision number 320/P/2019 (Dewanti, 2020). Educational institutions, as platforms shaping the future generations, must not only preserve cultural traditions but also present an education system capable of addressing global challenges. Globalization is a dynamic reality, as highlighted by Ajizah (2021). Technological advancements have a broad impact, including in the field of education. Zubaidah, as cited by Hasanuddin et al. (2022), describes digital literacy as a key skill for learners facing the digital world, enabling critical, creative, and safe practices when dealing with digital technology in all aspects of life.

Digital literacy in the context of digital technology is the ability to use technology as a tool for work and learning, as defined by Nafi'ah Setiani and Barokah (2021). Another definition describes digital literacy as an individual's ability to research, create, and communicate more effectively, whether at home, school, workplace, or in daily life (Uršej, 2019). In the last decade, digital technology has

become part of society's culture. Digital media has become a central aspect of many people's lives, regardless of age. Therefore, the skills, knowledge, and understanding of digital literacy become crucial as digital culture grows among the community, from adults to young people and even children (Nafi'ah Setiani & Barokah, 2021).

To prepare students for technological literacy, early preparation is required, starting from schools. Schools serve as a platform to train students to become accustomed to the use of information technology, making it a familiar aspect of their lives. Digitalization of education can take the form of content digitalization and facility digitalization, with the presence of digital education paving the way for the realization of future-oriented smart schools (Murhadi & Ponidi, 2019).

The era of digitization, associated with the fourth industrial revolution, requires students not only to master science and information technology but also to be able to develop technology, presenting a real challenge. In line with these developments, the challenges faced by teachers in producing graduates that meet parental expectations are becoming more complex and are constantly adjusted to societal demands (Aulia et al., 2020). Both software and hardware tools are needed to face these challenges, including the learning process, as stated in the Ministry of Education and Culture Regulation Number 22 of 2016 on Basic and Secondary Education Process Standards. The regulation emphasizes that the learning process in educational institutions should be interactive, inspiring, enjoyable, challenging, motivating students to be actively involved, and providing sufficient space for initiatives, creativity, and independence in accordance with the talents, interests, and physical and psychological development of students (Sulis Setiawati, 2019).

Information technology in the modern era has penetrated all aspects of human life. Educational technology is an integrated strategy process in solving learning problems, serving as a system used to support learning to achieve desired outcomes. Therefore, educational technology is considered all efforts aimed at solving problems related to learning (Fauziah et al., 2020). The digitization of education programs involves utilizing technology as an aspect of the learning system, from curriculum to education administration. In the era of Digital Education Programs, understanding digital literacy, a set of basic technical skills to operate computer devices and other supporting media to understand, think critically, evaluate, and design communication content, is crucial. Paul Gilster, as mentioned by Eti (2020:70), defines digital literacy as the ability to use technology and information from digital devices effectively and efficiently in various contexts such as academic, career, and daily life.

2. METHODS

This research utilizes qualitative research methods (Darmawan, 2013) employing the library research method or literature review, also known as Content Analysis, related to the importance of educational digitization to obtain research data from library sources (Rahmi, 2021). The data sources in this study consist of subjects where the researcher obtained information sources related to the urgency of educational digitization in various forms such as recordings, images, sound, writing, and others, objectively and systematically (Rahmi, 2020). The data collection technique involves documentation such as scholarly articles, government documents, mass media, books, and other relevant materials, which are then analyzed using policy research methods (Qiftiyah et al., 2020).

3. RESULTS & DISCUSSION

Digital literacy is an essential skill for students at all levels of education. The digital world enables everyone to connect, collaborate (Rahmi & Fadhil, 2022), innovate, and discover continuously evolving information. In today's digital age, digital literacy is inseparable from students' skills, understanding, and knowledge, which will help them play significant and active roles in social, cultural, economic, and intellectual life, whether the impacts are felt now or in the future.

In the realm of education, digitization is the ability to transform various perspectives and educational processes into various forms of digitalization. Moreover, technology can improve human beings, serve as a platform for student creativity, foster a desire for critical thinking among students, and enhance the quality and structure of education, facilitating smooth learning processes. Thus, the emphasis of learning implementation should be on students' efforts to seek learning sources, problem-solving skills, and analytical thinking. The 21st century emerges specifically due to the global educational reality that has not fully met the needs of educational output, where the prevailing mindset generally revolves around competition. In this context, a competitive mindset only emphasizes cognitive aspects, sidelining cooperation and collaboration culture. From the perspective of the 21st century, this is contrary to the idea that individuals live in an environment rich in technology use, with widespread access to information, new communication patterns, and collaboration. Therefore, to support success in the digital age, a foundation of digital skills is crucial, including critical thinking, problem-solving, communication, and collaboration skills.

In today's era of information openness, digital literacy becomes crucial. The ability to operate digital technology devices is a necessity, as is the ability to interact in the digital world. Effective communication occurs when students understand the various forms of communication in the digital world. Currently, almost all aspects of human life use the internet, increasing the urgency to enhance digital literacy, from understanding responsible digital product use to accessing networked data sources.

Schools, as educational institutions, play a significant role in managing technology correctly as a learning tool or medium. Technological developments in the educational world have many positive aspects, but they also have negative implications. Therefore, human resources capable of managing technology appropriately as a learning tool are highly needed. The design of technology in the educational world should incorporate educational values and ethics to maximize its potential.

The fourth industrial revolution has brought about significant changes in various aspects of human life, including education. With the COVID-19 pandemic, schools are required to conduct digital-based learning activities. This could become a new culture in learning activities, indirectly enhancing learning quality by implementing new digital learning patterns (Septina Alrianingrum, 2020). The industrial revolution is defined as a rapid change process where the produced products have added value and better commercial value. The increase in data volume, computing power, connectivity, and the emergence of data analysis by the Internet of Things (IoT) or Internet of People (IoP) originating from human-machine interactions are the main work patterns and characteristics of the fourth industrial revolution, making it also known as the era of disruptive technology (Kasali, in Anggraeni, H., et al., 2019). The Ministry of Research, Technology, and Higher Education (2018) stated that the fourth industrial revolution era would disrupt various human activities, including science and technology fields and higher education. Therefore, educational support and roles are expected to enhance the nation's competitiveness amidst rapid global technological developments.

The era of globalization has significant impacts on every aspect of life. The education sector is required to produce human resources with four competencies known as 21st-century competencies (Yuni et al., 2016). This term is promoted because this era demands quality in every human effort and work result. Referring to the statement above, the Partnership for 21st Century Learning demands that students have skills, knowledge, and abilities in technology, media information, learning and innovation skills, life skills, and career as outlined in the 21st-century learning framework (Prayogi & Estetika, 2019). In other words, 21st-century competencies can be presented in the following four categories: ways of thinking, including creativity and innovation; ways of working, consisting of communication and collaboration; tools for working, including general knowledge, and

information and communication technology skills (Sugiman et al., 2022); and ways of living, which include career, personal and social responsibility, including awareness of culture and competence (Griffin et al., 2012).

In the era of the fourth industrial revolution towards industry 5.0, education should not only turn students into passive learners but rather the opposite. Learning must be student-centered and allow students to explore various sciences independently through various evolving technologies. Therefore, students must be equipped with four abilities (Creative, communicative, critical thinking, and collaborative) (Costa et al., 2022) by utilizing the role of technology in supporting these abilities.

a. Creative

The advancement of technology and information is not always a challenge for teachers. This advancement can be seen as an opportunity to develop the potential of teachers in honing students' abilities to face the Industry 4.0 revolution. Technological advancements also facilitate teachers in delivering learning materials with the help of instructional animations, PowerPoint presentations, and similar tools that emphasize student-centered learning (Sugiman et al., 2022). Additionally, technology-based learning can present engaging and enjoyable learning experiences (Ajizah, 2021). Besides creativity in delivering lessons, the use of technology provides opportunities for students, such as creating simple instructional videos, which technology serves as a platform to showcase students' creativity and opens pathways for everyone to develop themselves (Ajizah, 2021). Therefore, creativity is not just about students who are good at drawing or wording in a text. Instead, creativity can be interpreted as thinking outside the box without limitations imposed by binding regulations.

b. Communication

Communication is defined as students' potential to present their ideas and thoughts quickly, clearly, and effectively, including several sub-skills such as reading the audience to ensure their message is conveyed. In this regard, students are expected to master, organize, and build good and correct communication verbally, in writing, or through multimedia. Technological advancements provide much easier communication access than before, whether between educators and students or among students. This has advantageous impacts on individuals in enhancing their communication skills (Ajizah, 2021). This benefit is also greatly felt by introverted students. Where introverts can use technology as a facility to express their arguments in writing. This is relevant as shown in a study by (Afifah et al., 2016) through the development of media named letter sharing.

c. Critical thinking

Critical thinking can be interpreted as a person's ability to argue in a structured manner. In the process, critical thinking skills are applied in mental activities such as problem-solving, decision-making, persuading, analyzing opinions, and conducting scientific research. In other words, critical thinking skills are applied to systematically evaluate the weight of personal arguments and the opinions of others (Ajizah, 2021). The implementation of technology-based learning can ignite students' enthusiasm, which will affect the improvement of their learning motivation. Thus, students are encouraged to think critically about a problem, where they are required to solve the problems that arise. This can be encouraged through the implementation of Problem-based Learning strategies, where students utilize technology to obtain information to solve the problems they face. Referring to the statement above, many modern people rely more on internet search engines than available library services (Santoso & Isminarti, 2020).

d. Collaborative

Collaboration, or in other terms known as cooperation with a group of people to achieve common goals (Ajizah, 2021). In the learning process, this activity is important to be implemented to students so that they are trained to develop the best solutions that can be accepted by everyone in their group and ready to cooperate in the future. In this collaboration, children will gain learning such as empathy towards others, respecting different

opinions, and leadership. Additionally, collaboration aims to shape students to have a sense of responsibility, adapt easily to the environment, society, and set high targets for groups/individuals. In this regard, educators are responsible for training students' collaboration skills. With the technological advancements in today's era, teachers can utilize technology as a medium to help students collaborate without being limited by space and time (Hamidy & Purboningsih, 2016).

In welcoming the era of Society 5.0 revolution, the government has begun to develop everything based on digital platforms, especially in education. One of them is the implementation of independent learning. Independent learning is a program designed with the aim for students to have the freedom to learn, not only in specific classrooms but anywhere. This statement is in line with what Meylan Saleh expressed; he stated that independent learning is learning done without coercion, where students can be free to be creative and innovate (Saleh, n.d.). Furthermore, Aan Widiyono et al. also expressed similar views; they stated that independent campus is a natural learning process aimed at obtaining freedom and opening up broader learning opportunities, which can also stimulate students' interest in learning (Ke et al., n.d.). Here are some opportunities of independent learning, including developing students' creativity, fostering curiosity through exploration and experimentation related to learning, and allowing learning to take place anytime and anywhere without being restricted by space and time (Sidiq, n.d.). However, there are several challenges in the independent learning program, one of which is that lesson plans need to be shorter and must adapt to the personalities of students (Sasikirana et al., n.d.). In this program, there are also some implementation challenges, such as educators finding it difficult to determine indicators when arranging lesson plans (Fibra et al., 2021). Moreover, economic deficiencies can also hinder the realization of independent learning due to insufficient budgets to fulfill facilities in its implementation (Suhartono et al., n.d.). Thus, it can be understood that the government's "independent learning" program greatly assists students in developing creativity and increasing knowledge. Here, learning can take place anywhere and anytime, without being bound by space and time. In fact, learning can also proceed smoothly with or without educators.

Regarding the discussion above, in terms of education, the Society 5.0 revolution is a learning process that will be carried out without limitations of place and time, and whether or not educators are present is not a problem (Sasikirana et al., n.d.). In schools, students are now being accustomed to using technology to prepare for the Society 5.0 revolution. All students are required to master digital-based things. One of them is smartphones, which have become the most common learning media during the Covid-19 pandemic. At the elementary school level, the use of smartphones must be supervised by parents to minimize the negative impacts of smartphone use, one of which is students becoming lazy to study and only relying on the internet without genuine interest in learning. Regarding the above, Cut Nelga Isma et al. stated that when using smartphones, students must still be under parental supervision, and every parent must be firm with their children to prevent negative impacts of smartphone use (Pendidikan Tambusai et al., n.d.). Furthermore, Faiz N also mentioned that there are many possibilities for young children when using smartphones, both good and bad. In this case, he stated that parents play a crucial role as supervisors and controllers in the child's development process.

4. CONCLUSION

In conclusion, in the digital era and the fourth industrial revolution, education plays a crucial role in shaping learners to be individuals ready to face future challenges. Through the development of creative, communicative, critical thinking, and collaborative skills, education can produce competent and adaptable generations to technological and environmental changes. The use of technology in education allows teachers to create engaging and interactive learning experiences for students. It also opens opportunities for students to develop their skills through creativity, collaboration, and various digital media. Effective communication is key in

facilitating student-oriented teaching and learning processes. By leveraging technology, students can communicate more easily and efficiently, as well as develop critical and reflective communication skills. Critical thinking skills lay the foundation for problem-solving and making sound decisions amid the complexities of the modern world. Through learning approaches that encourage students to think critically, they can develop the analytical and evaluative skills necessary for success in life. Collaboration among students is also crucial in creating an inclusive and supportive learning environment. By working together in groups, students can learn to appreciate differences, build empathy, and solve problems collectively. Overall, technology-based education prioritizing the development of critical and collaborative skills is key in preparing future generations for success in the digital era and the fourth industrial revolution.

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