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Digital Transformation in Education: A Study of Technology Implementation at SMA Negeri 5 Makassar City

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ABSTRACT

Digital transformation in education has become an essential need to improve the effectiveness of learning. This study aims to analyze the implementation of digital technology in SMA Negeri 5 Makassar City in supporting the learning process. The research method used is a qualitative method with a case study approach. Data were collected through interviews, observations, and documentation. The results of the study indicate that the use of digital technology such as the Learning Management System (LMS), online learning applications, and other digital devices can improve interaction between teachers and students, and provide flexibility in the teaching and learning process. However, challenges such as limited infrastructure and readiness of educators are still major obstacles. Therefore, strategic policies are needed from schools and the government in optimizing the application of digital technology in education.

Keywords: Digital Transformation, Education, Digital Technology, Learning, State Senior High School 5.

INTRODUCTION

The Industrial Revolution 4.0 era has brought major changes in various sectors, including education. Digital transformation in the world of education is a must to increase the effectiveness and efficiency of the learning process. According to Prensky (2001), the current generation is a "digital native" who is more accustomed to technology, so conventional learning approaches need to be adjusted to remain relevant. The implementation of digital technology in schools can increase the accessibility of learning resources, more dynamic interactions between teachers and students, and flexibility in teaching methods (Anderson & Rainie, 2020).

The development of an increasingly modern era is marked by the rapid advancement of digital technology. This digital transformation has affected various aspects of life, including the world of education. Education, as the main pillar in building quality human resources, is required to continue to adapt to changes in the times (Pratama, 2020). One of the biggest challenges in the world of education is

creating effective and interesting learning for the younger generation growing up in the digital era (Suryadi, 2019). To face this challenge, the world of education has begun to change its learning approach to better suit the needs of today's students. In the last few decades, there has been a paradigm shift in education. The passive, teacher-centered learning approach is starting to be abandoned. Instead, more active, student-centered learning that is oriented towards developing 21st-century skills is becoming the main trend (Wijaya, 2021).

In Indonesia, government policies in supporting digital transformation in education have been realized through various initiatives, such as the "Merdeka Belajar" program which encourages the use of technology in the learning process (Ministry of Education and Culture, 2021). SMA Negeri 5 Makassar City as one of the leading schools has adopted various technologies in its learning process. However, the implementation of digital technology in schools still faces several challenges, such as limited infrastructure, readiness of educators, and student accessibility to digital devices.

One of the subjects that can utilize digital technology to increase student engagement is history. As a discipline that studies past events, history has also undergone a transformation in its learning methods. Digital technology is able to present history learning that is more interesting, interactive, and relevant to students' lives. With data visualization, simulations, and other interactive features, students can more easily understand complex historical concepts (Setiawan, 2021). For example, the use of interactive maps, documentary videos, or augmented reality-based applications allows students to explore historical events in a more lively and contextual way (Wahyudi, 2021).

However, the application of digital technology in history learning does not always run smoothly. Although technology has great potential, its implementation still faces various challenges. Several factors that influence the success of implementing digital technology in the classroom include teacher readiness, infrastructure availability, and the relevance of learning materials to the technology used (Hidayat, 2018). In addition, not all students have the same access to digital devices and internet connections, which creates a digital divide (Zulkarnain, 2020).

This study aims to analyze how the implementation of digital technology in learning at SMA Negeri 5 Makassar City, identify the benefits obtained, and the obstacles faced in the digital transformation process. The results of this study are expected to provide recommendations for schools and policy makers in increasing the effectiveness of the application of digital technology in education.

METHOD

This study uses a qualitative approach with a case study method. This approach was chosen to deeply understand the implementation of digital technology in learning at SMA Negeri 5 Makassar City (Yin, 2018). The study was conducted at SMA Negeri 5 Makassar City. The research subjects consisted of principals, teachers, and students involved in the digital technology-based learning process. The selection of subjects was carried out by purposive sampling based on their involvement in digital transformation at school (Creswell, 2014).

To ensure the validity of the data, this study applied triangulation techniques by comparing data from various sources (interviews, observations, and documents). In addition, member checking was carried out by asking respondents to verify the results of the interviews and research findings to increase validity (Lincoln & Guba,

1985).

RESULTS AND DISCUSSION

Implementation of Digital Technology at State Senior High School 5, Makassar City

1. Teachers' Perceptions of the Use of Digital Technology

Based on in-depth interviews, teachers at SMA Negeri 5 Makassar have a positive perception of digital technology. They realize that technology has great potential in delivering historical material in a more interesting and interactive way. This is in line with the opinion of Mishra and Koehler (2006) who stated that technology can enhance the learning experience through the integration of relevant, interesting, and contextual materials. Teachers expressed that the use of digital media, such as documentary videos, interactive maps, and augmented reality (AR)-based applications, can help students understand complex historical material, such as the spice route and the proclamation event. According to Setiawan (2021), interactive visual media can provide a more realistic learning experience, so that students can more easily understand the context and dynamics of a historical event.

However, there are several obstacles in implementing digital technology in learning several subjects. Teachers still face limitations in technical skills, media preparation time, and minimal training available. Many teachers feel not fully confident in using applications such as Google Forms, Kahoot!, or AR technology due to limited skills. This is in line with the findings of Hidayat (2018), which states that the lack of teacher competence in technology is one of the inhibiting factors in integrating technology into learning. As a solution, regular teacher training needs to be carried out to improve their technical competence. Nuryanti et al. (2020) emphasize the importance of technology training for teachers so that they are more confident and able to design digital technology-based learning effectively.

2. Student Experience in Digital Technology Based Learning

Students' experiences in technology-based learning show higher effectiveness compared to traditional lecture methods. Students feel more focused and motivated when using media such as animated videos, interactive quizzes, or digital map applications. This is in line with the findings of Sari and Kurniawan (2020), which state that digital media can increase students' learning motivation through visualization and interactivity. In addition, technology-based learning provides a more contextual learning experience, allowing students to explore the material more independently. According to Zulkarnain (2020), interactive technology-based learning can help students build deeper conceptual understanding through active participation.

However, there are several obstacles in implementing technology in learning, such as unstable internet connections and limited access to digital devices. This inequality of access reflects the concept of the digital divide proposed by Van Dijk (2020), namely the gap in the use of technology that can hinder students' full participation in learning. To overcome these challenges, schools can develop policies that support access to technology, such as providing computer facilities or digital device subsidy programs for students in need. In addition, according to Santoso (2021), the use of simple media such as offline videos or quizzes based on local software can be a temporary solution to reduce dependence on internet connections.

Impact of Digital Technology Implementation

The use of digital technology has been shown to have a significant impact on increasing students' learning motivation. Observations show that students are more actively involved in discussions and group assignments when using interactive media. Media such as digital quizzes via Google Forms, Kahoot!, interactive maps, and documentary videos make students more enthusiastic and competitive. According to Sari and Kurniawan (2020), interactive digital media can increase student engagement because it can change the monotonous learning process to be more enjoyable. This is in line with behaviorist theory, which states that a fun learning experience can strengthen students' positive responses to learning.

In addition, the use of technology such as Google Forms, Quizizz, and Kahoot! also increases student competitiveness and collaboration. Yulianti's (2020) research shows that gamification in learning through digital platforms encourages students to compete healthily, thereby increasing their intrinsic motivation. Meanwhile, documentary videos and animations provide real visualizations that help students understand the material more deeply. Setiawan (2021) revealed that visual technology can strengthen students' memory of complex concepts.

However, challenges such as unstable internet connections are still an obstacle in implementing digital technology in the classroom. As a solution, a blended learning approach can be applied. As expressed by Graham (2019), the combination of online and offline learning allows students to still get the benefits of digital technology without fully relying on an internet connection.

CONCLUSION

Digital transformation in education at SMA Negeri 5 Makassar City has brought positive changes in the effectiveness of learning. The integration of digital technology allows teachers to deliver materials in a more interesting and interactive way, thereby increasing student engagement and understanding. Various media such as documentary videos, interactive quizzes, augmented reality (AR)-based applications, and online learning platforms have been used to support the teaching and learning process. However, although the benefits are quite significant, there are still several challenges that need to be overcome so that the implementation of digital learning can run more optimally. One of the main challenges is strengthening technological infrastructure. The availability of a stable internet network and supporting devices such as computers or tablets is still an obstacle for some students and teachers. This access gap can hinder the effectiveness of digital learning, especially for students who do not have adequate facilities at home. In addition, improving teachers' digital competence is also an important factor in the success of digital transformation. Although many teachers have shown a positive attitude towards technology, some still feel less confident in operating learning software or using digital platforms optimally. Therefore, regular training is needed that can improve teachers' skills in designing and managing technology-based learning. Policy support from the government is also a crucial aspect in accelerating digital transformation in the world of education. The government needs to provide regulations that support the procurement of technological devices, subsidies for students in need, and incentives for schools that actively develop digital innovation in learning

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