The Influence of Digital Technology on Learning Methods at SMA Negeri 5 Makassar City

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ABSTRACT

In the modern world of education, the integration of digital technology has become an important element in supporting the learning process in secondary schools. This study aims to analyze the influence of digital technology on learning methods and the effectiveness of student learning outcomes.This study uses a combination of qualitative and quantitative methods. Data were collected through in-depth interviews with teachers, observations of teaching and learning activities in the classroom, and distribution of questionnaires to students. The results of the study indicate that the use of digital technology has a significant impact on increasing student engagement in the learning process, the effectiveness of material delivery, and the development of their digital literacy skills. However, this study also found challenges in the implementation of digital technology, such as limited infrastructure, variations in teacher skills in utilizing technology, and unequal access among students. Therefore, ongoing support is needed to overcome these challenges so that the use of digital technology in education can be optimized to the maximum.

Keywords: Digital Technology, Learning Methods, Secondary School, Digital Literacy, Educational Challenges

INTRODUCTION

Education in the digital era is facing a major transformation, especially in learning methods in secondary schools. Digital technology is now an important element in the world of education, allowing teachers and students to access information faster, increase interactivity, and support collaborative learning. In Indonesia, especially at SMA Negeri 5 Makassar City, the integration of digital technology is both a challenge and an opportunity to improve the quality of education. One important aspect in the integration of digital technology is increasing students' digital literacy. Digital literacy includes the ability to access, analyze, and evaluate information critically. At SMA Negeri 5 Makassar City, the digital literacy program has begun to be implemented as part of the curriculum. However, more efforts are still needed to ensure that all students have these skills in order to use technology wisely and productively (Rahman, 2021).

The development of digital technology such as computers, the internet, and mobile devices has changed the paradigm of traditional education. Teachers are no longer the only source of information, but rather facilitators who guide students in utilizing technology to learn independently and actively (Setiawan, 2021). On the other hand, students can now take advantage of various online learning resources that help enrich their knowledge. As

facilitators, teachers also play a role in creating an interactive and collaborative learning environment. By using digital platforms, such as Learning Management Systems (LMS), teachers can design assignments that require students to search for information, analyze, and present results independently. This encourages students to be more active in the learning process and reduces their dependence on conventional lecture methods.

However, the implementation of digital technology in learning at SMA Negeri 5 Makassar City faces several challenges. Uneven infrastructure, limited internet access, and diverse digital skills of teachers are obstacles in maximizing the potential of this technology (Widiastuti, 2020). Furthermore, various educational applications such as Khan Academy, Ruang Guru, and Google Scholar provide opportunities for students to explore subject matter independently outside of school hours. This process encourages exploration-based learning, where students can explore broader topics according to their interests. Although digital technology offers various benefits, this paradigm shift also presents challenges. One of them is the readiness of teachers and students to face this transition. Not all teachers are accustomed to their new role as digital facilitators, and many require training to develop technological skills. On the other hand, students also need to be equipped with digital literacy so that they are able to sort and analyze accurate information amidst the flood of information on the internet (Yusuf, 2019).

Several studies have shown that schools that successfully integrate digital technology tend to increase student motivation and engagement in learning. Digital technology also supports active and collaborative learning. Students can engage in online discussions, work together on team-based projects through platforms such as Google Docs, or join discussion forums in virtual classrooms. This process encourages students to actively participate, exchange ideas, and learn from different perspectives. Technology-based collaborative learning strengthens social and teamwork skills that are essential for their readiness in the future world of work (Prasetyo, 2022). However, without adequate policy support and training for teachers, the effectiveness of using digital technology will be difficult to achieve.

Based on these conditions, this study focuses on the influence of digital technology on learning methods at SMA Negeri 5 Makassar City. This study aims to identify the extent to which digital technology influences the teaching and learning process and the challenges faced in its implementation. By understanding these factors, it is hoped that the best solutions and strategies can be found to improve the quality of education through optimal use of digital technology.

METHOD

This study aims to analyze the influence of digital technology on learning methods at SMA Negeri 5 Makassar City. The research method used is a mixed-methods approach (a combination of qualitative and quantitative) to obtain comprehensive data on the implementation and impact of digital technology in the teaching and learning process. The design used in this study is descriptive exploratory, which utilizes the main approaches of Qualitative and Quantitative. The location of the study was at SMA Negeri 5 Makassar City. With research subjects, namely 10 teachers from various subjects who use digital technology in learning. Students: 100 students from grades X, XI, and XII who actively use digital technology in the learning process And the Principal and IT Staff: To provide insight into technology policies and infrastructure in schools. Data from interviews and observations were analyzed using thematic analysis techniques While data from the questionnaire were analyzed descriptively using statistical software such as SPSS or Microsoft Excel.

RESULT AND DISCUSSION

Result

Based on the data collected through questionnaires, interviews, and observations, a hypothesis test was conducted to determine the effect of digital technology on learning methods at SMA Negeri 5 Makassar City. The test was conducted using simple linear

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regression analysis and t-test to test the significance of the relationship between the use of digital technology (independent variable) and learning methods (dependent variable).

1. Normality Test

Before conducting the regression test, the collected data were first tested for normality using the Kolmogorov-Smirnov test. Based on the results of the normality test, a p value of 0.15 (p> 0.05) was obtained, indicating that the data were normally distributed. Therefore, the data can be used for regression analysis.

2. Simple Linear Regression Test

The simple linear regression equation used in this study is:

$Y = \alpha + \beta X + \epsilon$

Where:

- Y = Learning Method

- X = Use of Digital Technology

- α = Constant (intercept)

- β = Regression coefficient

- ϵ = Error (error term)

The results of the regression analysis show that the regression coefficient β for the variable of digital technology usage is 0.65, with a p value = 0.003 (p < 0.05). This means that there is a significant positive relationship between the use of digital technology and learning methods. In other words, the higher the use of digital technology, the more effective and innovative the learning methods applied by teachers at SMA Negeri 5 Makassar City.

3. t-Test for Regression Coefficient

To test whether the regression coefficient β is significant, a t-test was conducted. Based on the results of the t-test, the t-count was 3.215 with a p value = 0.003 (p < 0.05). Because the p value is less than 0.05, the null hypothesis (H_0) which states that there is no influence between digital technology and learning methods can be rejected. Therefore, it can be concluded that the use of digital technology has a significant effect on learning methods at SMA Negeri 5 Makassar City.

This study aims to analyze the influence of digital technology on learning methods at SMA Negeri 5 Makassar City. Based on data obtained through observation, interviews, and questionnaires to teachers and students, the following are the results and discussions related to the use of digital technology in learning at the school.

Discussion
1. The Influence of Digital Technology on Learning Methods

In the digital era, the use of applications such as Google Classroom and other online discussion platforms has revolutionized the way students learn, especially in the context of collaborative learning. Collaborative learning itself is an approach in which students work together in groups to achieve certain learning goals. Digital technology provides convenience and facilities that allow students to work more effectively and efficiently in teams, especially outside of traditional classroom time and space (Hughes, JE, & Scharber, CP, 2008).

With applications such as Google Classroom, students can collaborate more easily on group projects and assignments. The application allows students to share materials, access assignments, submit work, and even provide feedback to their classmates in real-time. This greatly helps to speed up communication between students and improve their ability to work as a team. For example, the application allows discussions on specific topics outside of formal class hours, allowing students to stay connected and share ideas. Online discussion platforms, such as Zoom, Slack, and Microsoft Teams, also support real-time

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collaboration. Features such as chat, video calls, and screen sharing provide a more interactive experience, allowing students to have in-depth discussions about the material being studied, provide direct feedback, and work on group projects without having to meet physically. This is especially beneficial in the context of distance or hybrid learning, which is increasingly being implemented in various schools around the world, including in Indonesia (Smedley, S. (2014).

In addition to supporting collaboration, digital technology also enhances students' independent learning abilities. Google Classroom, for example, allows students to access materials anytime and anywhere (Laal, M., & Ghodsi, S.M., 2012). With this access, students can learn at their own pace and time, which not only improves their understanding of the material but also encourages them to take more responsibility for their learning process. Technology-based learning allows students to review the material that has been taught independently, search for additional learning resources via the internet, and work on assignments or exercises that can help them deepen their understanding. This gives students greater flexibility in managing their learning time, while improving their digital literacy skills, which are becoming increasingly important in a world that is increasingly dependent on technology.

Technology also plays an important role in increasing student motivation and engagement. The interactive features found in applications such as Google Classroom, which allow for assignment submission, immediate feedback, and progress tracking, encourage students to be more actively involved in the learning process. In addition, these applications often include gamification or game elements, such as point or badge systems, which can increase students' motivation to complete assignments or participate in discussions (Anderson, CA, & Rainie, L.2012). By using technology-based applications and platforms, students are more motivated to engage in the learning process, because they feel that learning is more fun and connected to their everyday lives, which are full of technology.

Although digital technology brings many benefits to collaborative learning, challenges remain. One of them is the gap in access to devices and the internet. Not all students have adequate devices or stable internet access, which can hinder the use of technology-based applications. To address this, schools need to ensure an even distribution of devices and improve internet access in schools and at students' homes, so that technology can be accessed by all students without constraints (Swan, K., 2003). In addition, although technology enables independent learning, it also leads to the need to pay more attention to the development of students' digital literacy skills. Teachers need to be involved in training on the effective use of technology, as well as how to facilitate digital learning in an interesting way that supports the development of student competencies.

B. Impact of Digital Technology on Student Motivation and Learning Outcomes

Digital technology has become a key element in modern education, with an increasing influence on how students learn and interact with learning materials. In this context, it is important to assess how digital technology can affect two main aspects of education, namely learning motivation and student learning outcomes. Based on the results of research conducted in several schools, including SMA Negeri 5 Makassar City, it can be concluded that digital technology has a significant impact on both aspects. Learning motivation is an important factor that influences student engagement in the learning process. In this study, the use of digital technology, such as online learning applications, e-learning, and collaborative platforms, has been shown to increase student learning motivation. Digital technology allows students to access learning materials anytime and anywhere, giving them the freedom to learn more independently and at their own pace. This gives students a greater sense of autonomy and control over their learning process, which in turn can increase intrinsic motivation.

In addition, technology-based applications often include gamification elements, such as point collection, badges, or leaderboards, which can increase a sense of positive competition and make students more interested in continuing to learn and complete tasks. As explained by (Anderson & Rainie, 2012), technology can increase students' learning

motivation by creating a more interactive and engaging environment.

Based on the results of interviews with students at SMA Negeri 5 Makassar City, most students reported that they felt more motivated to participate in learning that utilizes digital technology. The use of applications such as Google Classroom and Kahoot provides a more interactive and enjoyable learning experience, which increases their enthusiasm for participating in learning activities.

Student learning outcomes refer to the academic achievement and understanding gained by students after participating in learning. Digital technology not only increases learning motivation but can also contribute to improving student learning outcomes. With more diverse and easily accessible learning resources, students can deepen their understanding of the subject matter. The use of learning videos, interactive simulations, and online discussion platforms allows students to learn more deeply and comprehensively. This study shows that students who actively use digital technology to learn achieve better results in exams and assignments compared to students who only rely on traditional learning methods. In this case, platforms such as Google Classroom allow students to access materials more easily, while applications such as Quizlet and Edmodo provide exercises that can improve their understanding. Research conducted by (Swan, 2003) shows that the use of technology in learning can improve students' understanding and mastery of the material.

In addition, digital technology facilitates collaborative learning, where students can work together to complete assignments or projects. This collaborative learning enhances the understanding of difficult concepts as students share information and knowledge with each other. Online discussion platforms allow students to ask questions, discuss, and receive feedback directly from classmates and teachers.

Although the impact of digital technology on student motivation and learning outcomes is quite significant, this study also found several challenges that need to be addressed. One of the main challenges is the availability of technological infrastructure. Not all students at SMA Negeri 5 Makassar City have adequate access to digital devices or a stable internet connection, which can hinder the technology-based learning process. In addition, teachers' digital skills are also an important factor in the effectiveness of technology use in learning. Teachers who are trained in using digital technology can create a more engaging and effective learning experience. However, if teachers do not have sufficient skills in using technology, digital learning can be less than optimal.

To overcome these challenges, several steps can be taken. First, there needs to be an improvement in technological infrastructure, such as providing devices for underprivileged students and ensuring more equitable internet access. Second, teachers need to receive regular technology training so they can utilize the potential of digital technology to support learning. Schools can also provide a learning platform that is more user-friendly and easily accessible to all students.

C. Challenges in Implementing Digital Technology

Although the use of digital technology in education offers various significant benefits, effective implementation in schools, including at SMA Negeri 5 Makassar City, faces a number of challenges that need to be considered. In the results of the study, it was found that although many benefits were felt by students and teachers, there were still several obstacles that needed to be overcome so that the integration of digital technology could run optimally in the learning process. The main challenges found in this study include technological infrastructure issues, teachers' digital skills, gaps in technology access between students, and dependence on technology. One of the main challenges in implementing digital technology at SMA Negeri 5 Makassar City is limited infrastructure, especially in terms of hardware and internet connection. Although some schools have provided technology facilities, not all students can access the devices needed to participate in technology-based learning. Some students may not have adequate smartphones, laptops, or tablets to access online learning platforms. In addition, unstable internet connection problems in some areas can also hinder the smooth running of online or hybrid learning. From interviews with teachers and students at SMA Negeri 5 Makassar City, many revealed

that unstable internet connections are a major obstacle in the use of digital technology. Even in classes that are equipped with digital devices, students who do not have personal access to technology often have difficulty following the learning.

The second challenge identified is teachers' digital skills. Although technology is increasingly integrated into education, not all teachers have the skills or confidence to use digital technology effectively. Most teachers still rely on traditional learning methods, which hinders the maximum use of technology. Digital technology requires the ability to utilize various tools and applications, as well as to modify teaching methods to suit the digital format. Interviews with several teachers showed that most felt less confident in operating several digital platforms, such as Google Classroom, Zoom, or other interactive learning applications. Most teachers admitted that they needed further training to understand how to integrate technology into their learning. To overcome this problem, regular training for teachers needs to be held to develop their digital skills. In addition, schools can collaborate with training institutions or third parties to provide courses on the more effective use of educational technology.

The gap in access to technology among students is also a major issue. In some areas, not all students have the devices needed to access materials or take online classes. This creates inequities in the quality of education received by students, with students who do not have devices or good internet connections tend to lag behind in the learning process.

Several students at SMA Negeri 5 Makassar City reported that they had difficulty accessing online learning because they did not have adequate devices or did not have enough internet quota. This indicates an inequality in access to technology that can affect their learning outcomes. The solution that can be done is to provide loan devices or internet quota subsidies for students who need them. In addition, school policies to provide learning materials in formats that can be accessed offline (for example, using USB or other physical media) can help overcome this obstacle.

Another challenge that arises is the dependence on technology. Although digital technology can improve the effectiveness of learning, relying too much on technology can reduce social interaction between students and students with teachers. Several studies have shown that excessive use of technology can reduce students' social skills, such as the ability to communicate directly or work together in groups. In addition, dependence on digital devices can also cause students to feel mentally exhausted (digital fatigue) or lack focus in learning. The results of interviews with several students at SMA Negeri 5 Makassar City revealed that they felt exhausted after using digital devices for learning for a long time. They said that although technology makes it easier to access information, they often feel less motivated because learning feels more mechanical and less interesting. To overcome the problem of dependence on technology, it is important to combine digital learning with traditional learning methods that still involve direct interaction between students and teachers. In addition, providing sufficient breaks between online learning sessions to reduce digital fatigue and encourage physical or social activities can help maintain balance.

CONCLUSION

Based on the results of research on the influence of digital technology on learning methods at SMA Negeri 5 Makassar City, it can be concluded that digital technology has a significant impact on learning at the school, both in terms of student motivation and their learning outcomes. Digital technology has helped increase student engagement in the learning process, facilitate access to information, and enrich their learning experience through online learning platforms and interactive applications.

1. Improving Student Motivation and Learning Outcomes:

Digital technologies, such as the use of learning applications, collaborative platforms, and online learning media, have been shown to increase student motivation. The use of technology allows students to learn independently and more actively, and to work together on group assignments, which improves their learning outcomes. Students

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who use technology in their learning demonstrate a deeper understanding of the material and are better prepared for exams.

2. Challenges in Implementing Digital Technology:

However, the implementation of digital technology at SMA Negeri 5 Makassar City also faces several challenges. Infrastructure issues, such as limited devices and uneven internet connections, hinder students from optimally utilizing technology. In addition, teachers' limited digital skills are also an obstacle to the effective use of technology in the classroom. The gap in technology access between students, especially for those who do not have sufficient devices or internet quotas, is also a challenge that needs to be addressed immediately.

3. Solutions to Challenges Faced:

To overcome these challenges, efforts need to be made to improve technology infrastructure in schools, including the provision of devices and more equitable internet access. In addition, training programs for teachers to improve their digital skills are needed so that they can use technology more effectively. Providing loan devices or subsidizing internet quotas for students in need can also be a solution to reduce the gap in technology access between students.

REFERENCES
Anderson, C. A., & Rainie, L. (2012).The future of technology and education: Shaping the future of learning in the digital age. Pew Research Center.
Laal, M., & Ghodsi, S. M. (2012).Benefits of collaborative learning. Procedia-Social and Behavioral Sciences, 31, 486-490.
Rahman, A. (2021). "Digital Literacy Among High School Students: A Case Study of Makassar City." Journal of Digital Literacy, 6(3), 27-39.
Prasetyo, R. (2022). "Implementation of Flipped Classroom with Digital Media in Secondary Schools." Journal of Educational Technology, 14(1), 34-49.
Smedley, S. (2014).Using Google Classroom to facilitate collaborative learning. International Journal of Education and Development using Information and Communication Technology (IJEDICT), 10(2), 42-56.
Swan, K. (2003).Learning effectiveness: What the research tells us. The Sloan Consortium.
Setiawan, D. (2021). Digital Transformation in Education: Opportunities and Challenges. Jakarta: Gramedia.
Tapping into the research literature on technology and learning: A review of the literature. Journal of Educational Computing Research, 38(2), 107-126..
Widiastuti, S. (2020). "Evaluation of Technology Infrastructure Readiness in Secondary Schools." Journal of Digital Education, 8(2), 45-56.
Yusuf, M. (2019). Education and Digital Literacy in the 4.0 Era. Bandung: Alfabeta.