



THE ROLE OF TECHNOLOGY IN DIGITAL ERA LEARNING: OPPORTUNITIES AND CHALLENGES

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Abstract:

This research aims to analyze the role of technology in learning in the digital era with the object of teachers. The research method used in this study is qualitative research method with literature study. This study reports three important data themes that include the ability to utilize technology in learning, opportunities in developing learning using technology in the digital era and challenges faced in utilizing technology. In doing so, the researcher investigated how to overcome challenges and capitalize on opportunities to improve the quality of education in the digital era. By combining innovative approaches to teaching, teacher professional development, the use of technology in digital learning becomes a bridge for teachers and students in the development of learning in the digital era.

Keywords: Technology, Learning, Digital Era

INTRODUCTION

The rapid development of technology, especially in the education sector, marks the era of society 5.0. As the main component in technological evolution, humans are required to be adaptive to the rapid flow of information and the dynamics of technological development that dominates the world of education.

As time goes by, technological developments also bring changes to life, including the world of education. Comprehensive innovation in education is a necessity considering its central role in the learning process. Technology plays a crucial role in facilitating collaboration and deeper understanding of concepts.

In the world of education, digitalization is also very useful and makes the teaching and learning process easier with the aim of prosperity and happiness. The presence of the internet also makes humans and technology become an inseparable, interdependent, and influential unit so that human daily activities become increasingly realized and ultimately become a new culture of interaction in the digital age. This condition makes changes increasingly real in the lives of people who want to be more efficient and easier in carrying out their activities.

Learning technology offers many benefits in its use, such as increasing student engagement, inspiring creativity, increasing efficiency, and enabling individual needs in learning. Also as a means to prepare future generations with the skills needed in an increasingly connected world. Technology plays an important role in improving student understanding. The use of multimedia provides opportunities for students to acquire basic knowledge effectively.¹

Pembelajaran di era digital memiliki karakteristik yang berbeda dengan pembelajaran pada umumnya. Di era digital saat ini, perkembangan teknologi

¹ Muhamad Yasin, Abdul Aziz, *Teknologi Pembelajaran* (Yogyakarta: Garudhawaca, 2023)61.

tidak bisa diabaikan begitu saja. Derasnya arus informasi tidak dapat dihindari karena memang tidak mudah untuk mengendalikannya. Perkembangan pesat teknologi informasi saat ini menempatkan teknologi sebagai pilar penting dalam dunia pendidikan. Teknologi berperan dalam meningkatkan kualitas pembelajaran, mempersiapkan siswa untuk menghadapi era digital, serta meningkatkan efisiensi kerja pendidik. Penggunaan perangkat lunak pembelajaran memungkinkan guru untuk lebih fokus pada aspek kreatif dalam mengajar.²

The purpose of this article is to analyze in depth the role of technology in digital era learning and examine the opportunities and challenges faced in learning technology. It is hoped that this article can provide readers with better insight into the importance of learning innovation as well as knowledge about the impact of technology in learning, digital skills that must be understood, and also offers to support the development of the use of learning technology, all of which are important contributions in facing the challenges of globalization and modernity in digital era.

RESEARCH METHODS

This research uses a qualitative approach by relying on literature analysis as the main methodology. Literature study is a data collection technique by searching, reading, and analyzing various kinds of literature such as books, journals, or scientific articles related to the research topic. The aim is to build a strong theoretical basis for the research.

Sugiyono also stated that literature is the result of human work that records, describes, or interprets events, ideas, or experiences that have occurred, whether in the form of writing, visuals, or other works of art.

This opinion is also supported by Moh. Nasir said that literature study is a research technique carried out by reading, analyzing and compiling data from various reading sources, such as books, journals and reports, to gain a deeper understanding of a problem..³

THEORETICAL STUDY

A. The Role of Technology in Digital Era Learning

Basically, technology has been practiced and applied by humans since ancient times. Technology is the application of science to achieve practical goals. Broadly speaking, technology includes all the means that humans use to fulfill their life needs.

Educational Technology itself is the study and ethical practice of using technology to support the learning process and improve performance. Educational technology is also a comprehensive framework for planning, implementing and evaluating learning activities. Educational technology emphasizes human interaction with learning resources to achieve optimal learning goals, meaning that it is related to the human learning process. In society, two terms are often used that are often used, namely Instructional Technology (Learning Technology) and Educational Technology (Educational Technology)..⁴

For the second term, namely "Learning technology" is an effort to design,

² Riska Aini Putri, *Pengaruh Tekhnologi dalam Perubahan Pembelajaran di Era Digital*, Vol 2, No 3, DOI: 10.56427/jcbd.v2i3.233, 106.

³ Mohammad Nasir, *Metode Penelitian* (Yogyakarta: Ghalia Indonesia, 2015) 111.

⁴ Mundir, *Tekhnologi Pendidikan* (Malang: Edulitera, 2022) 7-8.

implement and evaluate the entire learning process systematically for a learning objective based on research on the learning process and communication in humans using a combination of human and non-human sources so that learning can be achieved. take place effectively.

Meanwhile, according to Mundir, learning technology is an integrated system that involves various components, from concept to implementation, to analyze, find solutions and evaluate problems in the learning process. The scope of learning technology is more specific than educational technology as a whole.

The concepts of educational technology and learning technology often overlap in practice. However, in general, educational technology has a broader scope, including systems that support the development of overall human abilities. Meanwhile, learning technology is more specific, focusing on individual or group learning processes in an educational context.⁵

Pada abad 21, peran teknologi sangat penting pengaruhnya terhadap Pendidikan, khususnya dalam pembelajaran. Perkembangan pesat teknologi menuntut guru untuk menguasai dan mengintegrasikan teknologi dalam proses pembelajaran guna menciptakan desain pembelajaran yang inovatif dan kreatif.⁶

Digital era learning also emphasizes interactivity and collaboration. By utilizing digital technology, teachers can create a more interesting and interactive learning experience for students. Various digital learning resources such as videos and interactive applications can improve students' understanding of lesson material.

In the digital era, digital skills are also the key to student success in utilizing the role of information and communication technology (ICT) in the learning process. Three main digital skills that are relevant in digital era learning:

1. Digital literacy

In digital era learning, digital literacy is the ability to search, evaluate and use information effectively from digital sources which is the main foundation for students to master knowledge and access critical learning resources. Students are understood to look for relevant information and not from the media.

Digital literacy also involves the ability of online learning platforms, understanding navigation and software which are learning needs, also teaches to actively participate in social, political and economic life.

Digital literacy skills also support students in learning, such as accessing educational resources online, taking online courses, and interacting with peers. Digital literacy also helps individuals to be more aware of digital security threats and of online risks such as cybercrime, fraud, and misuse of data. Digital literacy also helps in understanding and following ethics in the use of social media technology.

2. Digital ethics

Digital ethics covers how to behave ethically, responsibly and respect the privacy rights of others in the digital environment. In the digital era, students are taught the importance of behaving responsibly in using technology, such as understanding copyright, information security, data

⁵ Muhamad Yasin, dkk, *Teknologi Pembelajaran dan Persoalan-persoalan Pembelajaran Indonesia di Era Pandemi Covid-19*, 4.

⁶ Andi Sadriani, *Peran Guru dalam Perkembangan Teknologi Pendidikan Era Digital* (29 Juli 2023) 33.

privacy, and wise use of media. Students must also be taught the social and cultural impacts of interactions in cyberspace and learn how to deal with cyberbullying wisely. Respect the privacy of others and always consider the consequences of online actions on people's privacy.

3. 3. Technology skills

In the digital era, students must master basic skills such as computer operation, typing, and use of mobile devices. Students should also learn about the productivity of word processing, spreadsheets, and presentations. More advanced skills include the ability to use creative software, such as photo and video editing, as well as utilizing collaboration tools and online learning platforms.

The core mission of learning technology is to facilitate the learning process and overcome problems that arise in the process. Learning technology acts as structured software designed to provide solutions to the increasing complexity in the world of education.⁷

B. Technology Opportunities in Digital Era Learning

The implementation of technology in education aims to improve the quality of education and learning in a sustainable manner, as well as encouraging innovation in the learning process. The use of technology is expected to facilitate students' access to diverse learning resources without the limitations of space and time.

Analysis carried out by Hattie (2012) resulted in research that the use of technology in learning has a positive impact on learning outcomes, especially mastery of material, critical thinking and problem solving.

In the book *Educational Technology*, Muhamad Yasin concludes the results of research from the journal Rogantina Meli Andri, that opportunities for using technology in learning include:

1. Technology can be a tool to support the understanding process in learning.
2. This media is designed to support learning processes that involve verbal interaction, such as collaboration, discussion and exchange of opinions.
3. Educational technology plays a role as a companion in the student learning process and allows them to express their understanding of the subject matter.
4. Educational technology is able to simplify the learning process and increase efficiency in teaching methods.
5. Educational technology can facilitate the achievement of predetermined learning goals.⁸

The increasing development of technology must be balanced with quality education in schools. Technology plays a role in providing access to information and making learning resources available to students.

C. Technological challenges in Digital Era Learning

Currently, one of the crucial challenges that affects the quality and accessibility of education is the problem of education infrastructure. The physical condition of a building that is not functioning properly will hinder the effective learning process and have an impact on the use of technology in

⁷ Suparman, A. dan Zuhairi, A., *Pendidikan Jarak Jauh Teori dan Praktek* (Jakarta: Universitas Terbuka, 2004) 23.

⁸ Muhamad Yasin, dkk, *Tekhnologi Pembelajaran dan Persoalan-perosalan Pembelajaran Indonesia di Era Pandemi Covid-19*, 61-62.

the learning process.

The challenge in question is difficulty accessing technology in the learning process. The following examples provide challenges or influences in its implementation.

1. Limited internet access

An inadequate or unstable internet connection can be an obstacle to teaching and learning processes that require internet access, such as distance learning or online libraries. Limited internet access will impact students' or teachers' willingness to use resources effectively, complicate the ability to obtain and share information and hinder progress in digital learning.

2. Lack of supporting facilities

Lack of supporting facilities for the use of technology in education refers to a lack of resources in implementing learning technology. Supporting facilities such as hardware (computers, laptops, tablets, smartphones), distance learning, cameras, microphones as well as learning programs such as NGOs, and online learning applications are very important in this digital era. The lack of supporting facilities impacts the ability of students and teachers to develop the necessary digital skills.⁹

3. Information Overload

Easy internet access means students can find various information, including inappropriate content. This has the potential to cause addiction, eye health problems, and disrupt the learning process.

4. Misuse of technology

Instead of being used for educational purposes, information technology is often misused by students for irrelevant activities. This raises concerns about decreasing student motivation to learn.¹⁰

5. Teacher Readiness and Training

Many educators say they need comprehensive and ongoing training to grow their confidence and ability to use technology to teach effectively. Lack of awareness and concerns about implementing technology were cited as barriers to accepting innovative teaching methodologies.

6. Student engagement and learning outcomes

Educators report improved student performance and learning outcomes when technology is used in the learning process, especially when interactive and multimedia elements are added.¹¹

CONCLUSION

Technology has a very important role in the transformation of learning in the digital era. With the various innovations presented, technology not only expands access to education but also supports improving the quality of learning. However, technology also presents challenges that need to be overcome to achieve an inclusive and effective education system. Here are the main conclusions:

⁹ Yaredi waruwu dkk, *Tekhnologi Pendidikan Transformasi Pembelajaran di Era Digital*, 13-14.

¹⁰ Riska Aini Putri, *Pengaruh Tekhnologi dalam Perubahan Pembelajaran di Era Digital*, Vol 2, No 3, DOI: 10.56427/jcbd.v2i3.233, 109-110.

¹¹ Raudhatul Hasanah, *Peluang dan Tantangan Tekhnologi dalam Pembelajaran Pendidikan Indonesia*, Sindoro: Journal cendekia Pendidikan, Vol. 4, No. 9, (2024) DOI : doi.org/10.9644/sindoro.v4i5.3317

A. Opportunities:

1. Educational Accessibility and Inclusion: Technology allows students from various backgrounds, including those in remote areas, to access educational resources through online platforms.
2. Personalization of Learning: Technology is able to provide learning that is tailored to students' individual needs, namely increasing the effectiveness of learning and making it easier to obtain educational information.
3. Collaboration and Creativity: Digital platforms enable cross-geographic collaboration and support innovative project-based learning.
4. Efficiency and Innovation: Digital tools will make it easier to manage classes, collect assignments, and evaluate learning outcomes, making it easier to achieve learning goals.

B. Challenge:

1. Digital Divide: Unequal access to technology and internet infrastructure creates inequality in the quality of learning.
2. Lack of Digital Literacy: Both teachers and students need special training to make the most of technology.
3. Technological Distractions: The potential distraction of social media and online entertainment content poses a threat to students' learning focus.
4. Privacy and Data Security: The risk of privacy and data security breaches is a big concern in technology-based learning.

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