

Digital Transformation of Education and Learning Quality in Indonesia

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ABSTRACT

The digital transformation of education has become a strategic policy to improve the quality of learning in Indonesia. The advancement of information and communication technology, along with the acceleration of digitalization during the COVID-19 pandemic, has encouraged significant changes in educational practices toward more flexible, innovative, and adaptive systems. This study aims to analyze educational digital transformation policies in supporting the improvement of learning quality in Indonesia. The research employed a library research method using a descriptive qualitative approach. Data were collected from scientific literature, national and international journal articles, and educational policy documents published over the last five years. The findings indicate that digital transformation contributes positively to learning quality through expanding educational access, strengthening digital literacy, enhancing teacher competencies, developing interactive learning media, and optimizing technology-based educational management. However, the implementation of these policies still faces several challenges, including digital infrastructure disparities, limited internet access, and differences in digital competencies among stakeholders. Therefore, strengthening digital infrastructure, improving human resource capacity, and developing a sustainable digital education ecosystem are essential to support better educational quality and competitiveness in the digital era.

Keywords: *Digital Transformation, Educational Policy, Educational Technology, Learning Quality, Educational Digitalization.*

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1. | INTRODUCTION

Digital transformation has become one of the strategic agendas in various sectors of life, including the education sector. The rapid development of information and communication technology is driving a paradigm shift in the implementation of education, from a conventional learning system to a more flexible, adaptive, and digital technology-based learning system. Digital transformation of education is not only interpreted as the use of technological devices in the teaching and learning process, but also includes changes in governance, organizational culture, learning methods, and the development of human resource competencies that are able to adapt to the demands of the digital era (Demartini et al., 2020). In the global context, the digital transformation of education is seen as an important instrument to improve the quality of learning and expand access to education more equitably (OECD, 2021).

The development of digital transformation is gaining more attention as the world faces the COVID-19 pandemic which has a significant impact on the education system. The closure of educational institutions at various levels has forced education providers to adopt technology-based learning in a relatively short time. This condition shows that the use of digital technology is no longer an option, but a necessity in ensuring the sustainability of the educational process. The World Bank (2020) explained that the pandemic has been a catalyst for the acceleration of education digitalization in various countries through the implementation of online learning and the development of digital education platforms. In line with that, UNESCO (2021) emphasizes that the future of education requires a new social contract that places technology as one of the main instruments in creating an inclusive, quality, and sustainable education system.

In Indonesia, the digital transformation of education is part of the education reform agenda which is realized through various policies, such as the Merdeka Learning program, school digitalization, strengthening digital literacy, and the development of technology-based learning platforms. These various policies aim to improve the quality of education services through the use of digital technology that is more effective and efficient. According to Soedjono (2022), digital transformation in education management plays an important role in increasing the effectiveness of education governance while supporting a more innovative learning process. In addition, the implementation of a digital-based learning system also encourages a change in the pattern of interaction between educators and students towards a more participatory and student-centered learning model.

The digital transformation of education has a close relationship with efforts to improve the quality of learning. The use of technology allows for a wider range of learning resources, quick access to information, and more interactive learning methods. Research by Nasikhah et al. (2022) shows that digital-based learning can increase student involvement in the learning process through the use of more varied learning media and resources. In addition, Darwanto et al. (2021) emphasized that strengthening literacy, numeracy, and technology adaptation are important components in creating

quality learning in the digital era. Thus, digital transformation has the potential to become a strategic instrument in improving the effectiveness and quality of learning at various levels of education.

However, the implementation of digital transformation of education still faces various challenges. Gaps in technological infrastructure, limited internet access, and low digital competence of some educators and students are factors that can hinder the effectiveness of the implementation of education digitalization policies. Budiman (2017) explained that the success of the use of information and communication technology in education is greatly influenced by the readiness of human resources and the availability of adequate supporting facilities. In addition, Salsabila et al. (2020) found that the implementation of technology-based learning still faces technical and non-technical obstacles that affect the quality of the learning process.

Based on this description, digital transformation of education is a strategic policy that has an important role in supporting the improvement of the quality of learning in Indonesia. However, the success of its implementation requires support from various aspects, both in terms of regulations, infrastructure, human resource competence, and the management of an education system that is adaptive to technological developments. Therefore, this study aims to analyze the digital transformation policy of education in supporting the improvement of the quality of learning in Indonesia and identify various opportunities and challenges that affect the effectiveness of its implementation. The results of the research are expected to make an academic contribution to the development of more effective, inclusive, and sustainable digital education policies.

2. | RESEARCH METHOD

This study uses the library research method with a descriptive-qualitative approach to analyze the digital transformation policy of education in supporting the improvement of learning quality in Indonesia. The literature study was chosen because the research focuses on the review of various scientific sources, policy documents, and academic literature relevant to the digital transformation of education without conducting direct field data collection. This method allows researchers to gain a comprehensive understanding of the concepts, implementations, challenges, and implications of education digital transformation policies based on the results of research and previously published documents.

The approaches used in this study include conceptual approaches and policy approaches. Conceptual approaches are used to understand various theories and concepts related to digital transformation, educational digitalization, learning quality, digital literacy, and the use of information and communication technology in education. Meanwhile, the policy approach is used to analyze the direction, objectives, and implementation of various education policies that support digital transformation in the national education system. Through these two approaches, the research can elucidate

the relationship between digital transformation policies and improving the quality of learning more systematically.

The data sources used in this study are secondary data obtained from various scientific literature relevant to the research topic. The data includes articles from national and international journals, scientific books, reports from international institutions, and education policy documents published in the 2018–2022 period. The selection of the time frame was carried out to obtain an overview of the development of digital transformation of education that is relevant to education conditions ahead of 2023. The literature used includes studies on the digitalization of education, technology-based learning, digital literacy, learning quality, and education policies that support the implementation of digital transformation.

Data collection techniques are carried out through the identification, selection, and documentation of various library sources that are related to the research focus. Furthermore, the data that has been collected is analyzed using content analysis techniques. The analysis was carried out by studying, grouping, comparing, and interpreting various information obtained from the literature to find patterns, relationships, and trends related to the implementation of educational digital transformation policies. Through this process, research can produce a deeper understanding of the contribution of digital transformation to improving the quality of learning and the various challenges faced in its implementation.

To ensure the validity of the data, the study applied a source triangulation technique by comparing information derived from various scientific references and different policy documents. The results of the analysis are then presented descriptively to provide a systematic overview of the education digital transformation policy, its impact on the quality of learning, and strategies that can be carried out to optimize the implementation of digital transformation in the Indonesian education system.

3. | RESULTS AND DISCUSSION

Digital transformation of education is a process of changing the education system that utilizes digital technology to improve the effectiveness, efficiency, accessibility, and quality of learning. The transformation not only focuses on the use of technological devices, but also includes a paradigm shift in education that places technology as an integral part of the learning process and educational governance. According to Demartini et al. (2020), the digital transformation of education involves comprehensive changes in organizational aspects, learning processes, human resources, and the use of technology to create added value in the implementation of education. In a global context, the OECD (2021) explains that digital transformation is a fundamental need for the modern education system because it is able to support the development of 21st century competencies which include critical thinking skills, creativity, collaboration, communication, and digital literacy.

The implementation of digital transformation of education in Indonesia has accelerated significantly in line with the development of information and

communication technology and the increasing need for a more flexible learning system. These changes are increasingly visible when the COVID-19 pandemic encourages educational institutions to adopt technology-based learning on a massive scale. The World Bank (2020) explained that the pandemic has put great pressure on education systems in various countries, so policy innovations are needed to ensure the sustainability of the learning process. In these conditions, digital technology is the main means that allows educational activities to continue despite various restrictions on face-to-face activities.

The development of digital transformation of education is also in line with UNESCO's view (2021) which emphasizes that the future of education requires a system that is more adaptive to social changes and technological developments. Education is no longer only oriented to the transfer of knowledge, but also to the development of students' ability to adapt to the ever-changing environment. Therefore, various education policies are beginning to be directed at strengthening the digital ecosystem that supports a more inclusive, flexible, and sustainable learning process.

In the context of national policies, the digital transformation of education is realized through various programs that aim to improve the quality of learning and expand access to education. One form of digital transformation implementation is the development of technology-based learning that allows students to gain access to various learning resources more widely. Budiman (2017) stated that information and communication technology has an important role in supporting the effectiveness of the educational process through the provision of fast, accurate, and easily accessible information. The use of technology also allows learning interactions that are no longer limited by space and time.

In addition to supporting access to education, digital transformation also contributes to improving the quality of the learning process. Nasikhah et al. (2022) found that digital-based learning is able to increase student engagement through the use of more interactive and interesting learning media. The use of learning videos, digital platforms, virtual simulations, and various educational applications provides a more varied learning experience than conventional learning methods. This condition has the potential to increase students' motivation to learn while strengthening their understanding of the material being studied.

Improving the quality of learning through digital transformation is also related to strengthening digital literacy. Gómez-Galán (2018) explained that digital literacy is an important competency that must be possessed by students to be able to access, understand, evaluate, and utilize information effectively in a digital environment. In the digital era, this ability is one of the important indicators that determine the quality of learning because students are required to be able to manage information critically and responsibly. Therefore, the digital transformation of education is not only oriented towards the use of technology, but also on the development of digital competencies that support a quality learning process.

Furthermore, Darwanto et al. (2021) emphasized that strengthening literacy, numeracy, and technological adaptation are interrelated components in efforts to improve the quality of education. Adaptation to technology allows students and educators to make optimal use of various digital learning resources so that the learning process becomes more effective. In this context, the success of digital transformation is not only measured by the availability of technology, but also by the ability of users to utilize the technology to achieve learning goals.

Digital transformation also has a positive impact on the development of educator competencies. The presence of various digital learning platforms encourages teachers to improve their ability to design, implement, and evaluate technology-based learning. According to Mardiana and Hidayati (2022), digital transformation in the implementation of learning encourages teachers to be more creative in choosing learning strategies and media that suit the needs of students. This condition contributes to the creation of a more innovative learning process that is oriented to the learning needs of students.

At the institutional level, digital transformation is driving changes in education management systems. Soedjono (2022) explained that the digitization of education management can improve the effectiveness of administration, data management, decision-making, and educational services. A digital-based management system allows various administrative processes to be carried out more quickly and efficiently so that educational institutions can focus more on improving the quality of learning services. Thus, digital transformation not only has an impact on the learning process, but also on education governance as a whole.

In addition, digital transformation contributes to increasing the competitiveness of educational institutions. Priyanto and Suhandi (2022) explained that digital transformation initiatives are able to increase the capacity of educational institutions in the face of increasingly competitive environmental changes. The use of digital technology allows educational institutions to provide learning services that are more flexible, innovative, and responsive to the needs of the community. Therefore, digital transformation is one of the important strategies in improving the quality and relevance of education in the era of globalization.

Despite its various benefits, the implementation of digital transformation of education still faces a number of challenges that need attention. One of the main challenges is the digital infrastructure gap. The availability of technology devices and uneven internet access can hinder the effectiveness of the implementation of digital-based learning. Salsabila et al. (2020) stated that limited internet access and learning devices are obstacles that are often faced in the implementation of technology-based learning. This condition shows that the success of digital transformation is greatly influenced by the readiness of adequate infrastructure.

Another challenge is related to the digital competence of educators and students. Even though technology is available, its use does not always run optimally if users do

not have adequate capabilities. Alruthaya et al. (2021) explained that the characteristics of learning in the digital era demand higher technological capabilities from both educators and students. Therefore, increasing digital competence is an important factor in supporting the success of digital transformation of education.

In addition to digital competence, the challenges of digital transformation are also related to the cultural readiness of educational organizations. Nabung et al. (2022) explained that the implementation of a learning system based on digital transformation requires a change in mindset and work culture that supports innovation. These changes often take time because they involve the process of adapting to technology, new learning methods, and work systems that are different from previous practices. Without the support of a strong organizational culture, the implementation of digital transformation has the potential to face various obstacles in its implementation.

The aspect of learning quality also needs to be a concern in the implementation of digital transformation. Mustofa et al. (2019) emphasized that online learning must be systematically designed to be able to produce learning quality that is equal to or even better than conventional learning. The use of technology alone does not automatically improve the quality of learning if it is not accompanied by good learning planning, appropriate teaching strategies, and effective evaluation. Therefore, digital transformation must be understood as a comprehensive effort that integrates technology with quality pedagogical principles.

Based on these findings, digital transformation of education has a significant contribution to supporting improving the quality of learning through expanding access to education, strengthening digital literacy, improving educator competence, developing learning innovations, and improving education governance. However, the success of its implementation is highly dependent on the readiness of infrastructure, human resource competence, policy support, and the ability of educational institutions to manage change in a sustainable manner. By paying attention to these various factors, digital transformation can be a strategic instrument in realizing an education system that is more qualified, adaptive, and relevant to the needs of society in the digital era.

4. | CONCLUSION

The digital transformation of education is one of the strategic policies that plays an important role in supporting the improvement of the quality of learning in Indonesia. The development of information and communication technology has encouraged a paradigm shift in education from a conventional learning system to a more flexible, innovative, and student-oriented learning. Through various education digitalization policies, the use of technology has provided greater opportunities to expand access to education, increase the effectiveness of the learning process, and strengthen the overall quality of education services.

The results of the study show that digital transformation makes a positive contribution to improving the quality of learning through the development of more

interactive learning media, increasing the digital competence of educators and students, strengthening digital literacy, and optimizing technology-based education governance. In addition, digital transformation also encourages the birth of various learning innovations that are more adaptive to the development of the times and the needs of society. The existence of digital technology allows the learning process to take place more effectively, efficiently, and is not limited by space or time.

However, the implementation of digital transformation of education still faces various challenges, including gaps in technological infrastructure, limited internet access, differences in digital competency levels, and the readiness of educational institutions to manage change. These challenges show that the success of digital transformation is not only determined by the availability of technology, but also by the readiness of human resources and sustainable policy support.

Therefore, integrated efforts are needed to strengthen digital infrastructure, improve the digital competence of all education stakeholders, and develop a learning ecosystem that supports innovation and quality of education. With this support, digital transformation can be an important foundation in realizing a more quality, inclusive, adaptive, and competitive Indonesian education system in the digital era.

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The authors declare that there is no conflict of interest.

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Ethical approval was obtained for this study. The manuscript represents original work and has not been previously published, nor is it under consideration by another journal.

Data Disclosure Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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