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Comparison of Digital Learning Strategies between Schools in Indonesia and Singapore

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Abstract

The advancement of digital technology has driven significant changes in the field of education, especially in the Southeast Asia region. This study aims to compare the digital learning strategies used in Indonesia and Singapore through a comparative research method based on document analysis. Information was obtained from various government policies, official documents, research articles, and relevant digital publications. The results show that Indonesia prioritizes equitable access to technology, enhancement of digital skills for educators, and provision of educational facilities through national policies. In this context, Singapore focuses on technological innovation, development of technology-oriented education systems, and application of collaborative learning methods supported by integrated digital devices. The comparison reveals that Indonesia still faces challenges related to infrastructure and digital capabilities, while Singapore has achieved a more consistent level of digital development. This research provides in-depth insights into the advantages and difficulties faced by each country, serving as a guideline for future education digitalization policies.

Keywords: *Comparative Study, Education Digitalization, Education Policy, Indonesia, Singapore.*

PRELIMINARY

Education plays a crucial role in a nation's development, as quality education empowers young people to become competitive individuals equipped with the skills to face global challenges. Over the past decade, Southeast Asia has seen significant progress in the digitalization of education, particularly following the COVID-19 pandemic, which has driven the widespread adoption of technology. Countries such as Indonesia and Singapore have begun formulating national policies related to digital transformation, including the development of online learning platforms, strengthening digital literacy curricula, and providing technological devices to schools and students.

This development can be observed through increased internet access in schools, the establishment of digital classrooms, and the implementation of one-to-one device usage, as is the case in Singapore. Consequently, various digital literacy training programs for teachers and students have become a primary focus to ensure the success of the teaching and learning process. Digital platforms such as the national Learning Management System, Google Classroom, Microsoft Teams, and Moodle are increasingly being used as primary learning media. These changes demonstrate a shift in educational perspectives from conventional methods to more independent, collaborative, and student-focused learning. However, digital transformation in education in Southeast Asia still faces various challenges, including lack of access to technology, limited digital skills among some teachers, and data security issues.

Advances in digital technology in the 21st century further emphasize the need for innovation in the education sector. Technology not only improves the quality of learning in terms of methods and content, but also expands access to information and enables more lively interactions between teachers and students (Education, 2024). Human dependence on technology is increasing, making it an inseparable element of daily activities. In the context of globalization, mastery of science and technology is a basic

need that serves to improve the quality of human resources and support economic growth, including in industry, trade, and science. In this regard, choosing Indonesia and Singapore as objects for comparison is highly appropriate given the fundamental differences in infrastructure, education policies, and learning outcomes.

Indonesia, as a vast country with diverse geographic and social conditions, faces challenges in terms of the distribution of digital facilities, educator skills, and internet access. Conversely, Singapore, with its small land area and centralized education system, has been able to consistently and efficiently implement technology integration across all educational institutions. This difference is also evident in international education outcomes, with Singapore consistently ranking among the highest in assessments such as PISA, while Indonesia continues to strive to improve the quality and equity of education. With such distinct characteristics despite being located in the same region, these two countries make perfect comparisons to understand the impact of policies, infrastructure, and education quality on the effectiveness of digital learning.

METHOD

This study employed a comparative method with a descriptive qualitative approach (Assingkily, 2021). This approach was used to detail the differences and similarities in digital learning strategies implemented in Indonesia and Singapore. Data collection was conducted through document analysis, examining various written sources such as government policies, scientific articles, official reports, and publications related to the digital transformation of education in both countries. All data was analyzed using content analysis, enabling researchers to identify key themes, interpret meanings, and systematically compare them according to the educational context in each country.

FINDINGS AND DISCUSSION

In the modern era, the world of education continues to change and innovate to maximize the potential of technology. The learning process has become easier and more flexible as a result of digitalization. Access to data and learning materials is no longer limited by time and place. Students can learn at their own pace and style, creating a more effective and adaptive learning environment. Learning resources are also increasingly open to all groups, including those with special needs, thanks to increased accessibility. Various online learning platforms enable students and teachers to communicate and collaborate better. Through digital spaces, they can share ideas, work on projects together, and strengthen social skills. However, collaboration in learning must remain ethical, avoiding plagiarism and maintaining academic integrity. While digital transformation offers many benefits, it also brings new challenges, particularly related to ethics and security. Therefore, wise use of technology, maintaining cybersecurity, and protecting personal data are crucial in today's educational development (Sofiani, 2025).

Digital Learning Implementation: Indonesia VS Singapore

In the ever-advancing digital age, technology has become a crucial element in almost every field, including education (Putra et al., 2024). The implementation of digital learning in Indonesia and Singapore has shown significant changes, with implementation methods varying based on the situation and priorities of each country. In Indonesia, the digital learning process is implemented in accordance with government policy, particularly referring to Presidential Instruction Number 7 of 2025 (Interaktif, 2025). This policy focuses on the distribution of interactive devices such as Interactive Flat Panels (IFPs) to more than 288,000 schools. The goal is to improve access to and quality of education, including in less developed regions. The government is also focusing on improving teacher skills so they can utilize technology optimally in teaching and learning activities. However, challenges remain, such as a lack of access to digital infrastructure in some regions, differences in technology use skills, and the ongoing need to improve educator competency.

Meanwhile, Singapore implements technology-based learning with its Edtech Masterplan 2030 strategy, which emphasizes building an innovation ecosystem in education (Ventures, n.d.). In this context, teachers function as collaborative learning designers utilizing technology, while students are equipped with the latest digital skills. This learning program also covers various age groups, including adult education, utilizing modern educational technology. Digital learning in Indonesian schools in Singapore

has undergone a stage of adaptation to the latest technology by using applications such as KIPIN ATM as a learning medium. Conceptually, Indonesia prioritizes equal access and educational capabilities for human resources, while Singapore places more emphasis on learning technology innovation and a modern educational ecosystem that is responsive to global needs. This illustrates the differences in the level of progress of the education systems and technological infrastructure in each country.

Comparison of Policy and Regulatory Effectiveness. One important factor influencing the success of social welfare programs in Indonesia and Singapore is the policies and regulations implemented by the government. Singapore, through its integrated and well-organized policies, addresses various social welfare issues. For example, in the housing sector, Singapore has the Housing Development Board (HDB) program, which offers affordable housing to all citizens. This program also includes subsidized assistance and low-interest loans for individuals with financial constraints (Lee, 2018). On the other hand, Indonesia faces difficulties in organizing and implementing efficient policies at both the national and regional levels. Although several initiatives exist, such as the Family Hope Program (PKH) and the National Community Empowerment Program (PNPM), duplication and a lack of collaboration between these programs often occur (Di et al., n.d.).

With diverse backgrounds, Singapore and Indonesia are striving to reform their education systems. The primary goal is to improve the quality of life of their citizens and address the challenges posed by modern developments. Although the two countries are located in a neighboring region, they differ markedly in various aspects, including social, cultural, political, economic, and geographical conditions. Therefore, it is crucial to understand how education policies are implemented in both countries. This will help us understand the reasons behind these policies and provide insights for other countries seeking to improve education quality through reform (Sa, 2020).

Singapore Government Strategy on Digital Education

The Singaporean government has affirmed its strong commitment to increasing investment in education and training. The goal of this investment is to prepare a skilled workforce ready to face the challenges of the information age. This reflects the government's approach, which emphasizes the importance of human resource development as a key factor in economic growth. This investment includes a variety of programs and initiatives aimed at improving the digital skills of the population. These programs are designed to provide individuals with the knowledge and skills necessary to actively participate in the digital economy.

Thus, this investment is not solely focused on formal education but also encompasses ongoing training and skills development. Education in Singapore is known for its innovative and creative methods, supported by the latest technology. The curriculum, which focuses on projects and group collaboration, aims to enhance students' critical thinking, collaboration, and effective communication skills. This statement demonstrates the government's commitment to creating a high-quality education system that is in line with current demands (Sofiani, 2025).

Singapore has successfully utilized technology in education to create engaging and interactive learning experiences. This technological application not only improves the quality of education but also prepares students to face the challenges of the digital age. Implementing this technology has resulted in innovative learning, enhanced critical thinking skills, and enhanced collaboration with others. Singapore is an excellent example of the use of technology in education, implementing the curriculum with a creative and novel approach. By integrating technology, Singapore has created an education system that produces skilled students ready to meet the demands of the 21st century. This method ensures that students in Singapore have the appropriate skills and are competitive in the international job market (Isbah et al., 2025).

Indonesian Government Strategy on Digital Education

To address various geographical and logistical challenges, the Indonesian government is utilizing digital technology, online learning platforms, and internet-based communication channels. This step not only increases access to policies but also accelerates their implementation process in the public sector, educational institutions, and various stakeholders. The OECD emphasizes that the successful implementation of education policies is highly dependent on the use of technology in various aspects.

Three key points support this statement. First, technology makes access to data that was previously difficult or expensive to obtain easier. With more accessible information, oversight, monitoring, and policy implementation can be carried out more accurately. For example, in the Netherlands, support for schools is determined based on reports of disadvantaged students.

Student administrative data will then be converted into digital format to enable more precise policy formulation. Second, technological advances enable the government to use more innovative and efficient policy instruments. Developed technological infrastructure, such as GovTech in Singapore, demonstrates that ICT projects can be implemented quickly, reducing costs. Furthermore, a sustainable data system allows student progress to be monitored from elementary school through entry into the workforce. Finally, digital channels open up broader collaboration between the government and stakeholders. For example, GovTech has developed various applications to streamline public services and provide information to families with young children in Singapore (Wang et al., 2023).

In Indonesia's education system, the use of information and communication technology (ICT) has provided numerous benefits, such as improving access, quality, and equity in education. The use of e-learning, the development of learning tools, and the integration of information and communication technology (ICT) have become crucial elements in transforming the country's education system. These changes have laid the foundation for a more inclusive and effective education system (Sofiani, 2025). Improving the quality of learning is one of the most significant impacts. The integration of information and communication technology (ICT) has enabled the use of more dynamic and interactive learning approaches, increasing student participation and understanding of concepts.

Technological applications such as artificial intelligence (AI) have increased the personalization and effectiveness of learning, allowing students' specific needs to be met more quickly and precisely. With the help of technology, learning is now easier and more effective. The Indonesian education system strives to utilize various technological innovations to improve the overall quality of education, create a more engaging learning environment, and provide broader access to social strata (Hidayatullah et al., 2023). By the end of 2023, the government has allocated approximately 17 trillion rupiah for the procurement of information and communication technology in the education sector. This substantial investment demonstrates the enormous opportunities that can be utilized to accelerate education reform through the use of technology and digital platforms.

Technology integration is expected to create an education system that is more inclusive and effective, and able to reach previously underserved areas. The Ministry of Education, Culture, Research, and Technology is also playing a key role in this transformation by building an integrated technology ecosystem to support the implementation of the new curriculum and various other strategic programs. This effort is realized through the development of various digital tools, including the Merdeka Mengajar Platform, which supports teachers in learning, ARKAS, which facilitates school budget management, SIPLah, which facilitates transparent operational spending, and the Education Report, which helps schools reflect and continuously improve quality. All of these tools function not only as administrative aids or information sources, but also as the main driving force behind change in national education management.

With a structured digital system, planning, implementation, and evaluation processes can be faster, more accurate, and more aligned with field needs. Education reform can also move more progressively, supported by robust data, efficient services, and closer collaboration between the central government, regional governments, and education units (Wang et al., 2023).

Challenges of Implementing Digital Learning Between Singaporean and Indonesian Schools

Although its implementation still faces several obstacles, this policy remains aimed at encouraging digital transformation in education. The challenges faced include:

1. Challenges for teachers in the digital era

   Many teachers lack adequate digital literacy skills, thus hindering the optimal implementation of this policy. Although most teachers are willing to learn technology, they still struggle to utilize it effectively due to a lack of appropriate training. This is also confirmed by Nashrullah et al. (2025), who stated that teachers' limited digital literacy is a limiting factor in the policy's success.

To face the challenges of learning in the digital era, teachers need to master technology and continuously strive to be creative and innovative individuals. Creatively designed learning will create a more challenging classroom atmosphere and can encourage students to be more actively involved in the learning process. The use of technology should be directed to improve the quality of learning. From an early age, teachers need to equip students with four important skills: the ability to think, communicate, collaborate, and discover and create something new. In the process of digital transformation, teachers are also required to shift from using conventional tools such as paper and whiteboards to the use of digital media.

However, the ultimate goal is not only the use of digital devices, but how teachers can shape students who are able to utilize technology well, have good communication skills, think critically, are independent, and can collaborate with others (Saerang et al., 2023).

2. Infrastructure gap between urban and remote areas

This situation is a major obstacle to the implementation of the policy. As a result, gaps in access to the policy's benefits have emerged, so that not all students and educators can experience its impact equally (Nashrullah et al., 2025). Even in rural areas not too far from the city center, the lack of educational infrastructure remains a major problem, especially in relatively remote areas. These deficiencies are evident in the condition of unsuitable classrooms, the inadequate number of classrooms to accommodate all students, and school buildings that are severely damaged due to their age and lack of repairs.

Even more concerning, some students have to travel long distances to attend school because there are no schools in their neighborhoods, even elementary schools. This disparity in educational infrastructure shows that there are still children in Indonesia who do not receive adequate education services. Without attention and prioritization of educational infrastructure development, hopes for educational progress will remain mere talk without realization. If classrooms do not meet proper standards, it is impossible for students to learn safely and comfortably. This condition also hinders the achievement of educational equality, considering that many areas in Indonesia still do not even have school buildings.

From budgeting to development and maintenance, the lack of educational infrastructure reflects weak planning and inaccurate resource distribution. When schools in remote areas or villages still lack adequate facilities, this indicates an imbalance in education policy and funding allocation. Ultimately, this situation creates inequalities in access to and the quality of education received by each child (Nurhayati & Mulyanti, 2025).

3. Budget constraints

This is another equally important issue. Many schools, especially those in remote areas, struggle to secure funding for digital devices or training. Without adequate investment in technological infrastructure, this policy is unlikely to be effective. Another problem arises from a lack of coordination between the central and regional governments, resulting in inconsistent policy implementation. Some regions even report that minimal technological assistance and delays in the distribution of digital devices have hampered the policy's success (Nashrullah et al., 2025).

Meanwhile, Singapore is one of the countries that has been able to integrate all four factors simultaneously, namely, national policy consistency, budget allocation, educator capacity, and infrastructure availability. Many developing countries still face significant structural challenges. Pedagogical approaches such as project-based learning (PBL) and inquiry-based learning are quite popular. However, in Singapore and Vietnam, these approaches are implemented within a curriculum framework that supports cross-disciplinary learning, resulting in more focused and consistent learning practices.

Singapore is able to ensure that laboratory facilities and ICT resources are evenly available across all schools. In contrast, many other countries still face limited access, particularly in frontier, outermost, and disadvantaged (3T) regions. As a result, schools with minimal resources are often unable to optimally implement pedagogical practices that require experiments or applied projects. STEM learning is also heavily influenced by its curriculum and assessment systems. Developed

countries generally align the two to measure cross-disciplinary competency. The sustainability of STEM programs themselves depends heavily on policy governance and the active participation of stakeholders. With consistent funding and regulatory support, Singapore is able to effectively implement its national strategy.

In many developing countries, it is difficult to achieve sustainable, nationwide STEM initiatives. This is because STEM programs are often fragmented into local projects, donor-funded programs, or limited pilots, thus lacking comprehensive integration (Bahri & Syahrul, 2025).

CONCLUSION

Based on a comparative analysis of digital learning strategies between Indonesia and Singapore, it can be concluded that both countries are striving to utilize technology to improve the quality of education, but they are at different levels and with different capabilities. Singapore's consistent implementation of digital transformation is supported by four key factors: stable national policies, strong budget allocation, adequate teacher capacity, and equitable technological infrastructure. Modern pedagogical approaches such as PjBL, inquiry, and STEM learning can be implemented optimally because the curriculum, assessment, and facilities are integrated.

On the other hand, Indonesia has demonstrated a strong commitment to digitalizing education through policies promoting equal access to technology, developing a digital ecosystem, and improving teacher skills. However, implementation remains hampered by several factors, such as low digital literacy among some teachers, infrastructure gaps, particularly between urban and remote areas (3T), and limited budgets and coordination between central and regional governments. These conditions mean that the policy's impact has not been felt equally by all educational institutions.

This comparison demonstrates that successful digital transformation depends not only on the provision of technological tools but also requires consistent policy governance, long-term funding support, improved teacher competency, and equitable distribution of educational infrastructure. By learning from the best practices of developed countries like Singapore, Indonesia has the potential to accelerate digital education reform and create a more inclusive, effective, and sustainable learning system.

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