Digital Transformation: Best Practices of Educational Platform in Indonesia

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Abstract. The objective of this research is to scrutinize and offer a comprehensive perspective on the digital transformation in Indonesia's educational system, along with exploring the factors that contribute to its success. The research employed a desk study approach, entailing a literature review and descriptive analysis methodology. The findings in this study reveal that the educational reform initiated by the Ministry of Education and Culture acts as a response to the Global Education Reform Movement (GERM). This reform is characterized by the adoption of the Merdeka curriculum and digital transformation, which involves technological interventions, launching various applications such as Arkas, SiPLah, Educational Report Cards and 'Merdeka Belajar'. The technological intervention has exhibited a significant impact on users and has been in line with the defined objectives. The incorporation of technology in the educational system can streamline lengthy multi-level processes and expedite the dissemination of information. The Ministry of Education and Culture's successful implementation of digital transformation has earned them numerous accolades both nationally and internationally. The key factors driving the success of this digital transformation include transformational leadership from the Minister of Education and Culture, school principals/teachers, the design and development process of the digital transformation that involves user engagement, and collaborative implementation.
Keywords: Digital Transformation; Learning Platform; Educational Reform

Abstrak. Tujuan dari penelitian ini adalah untuk meneliti dan menawarkan perspektif yang komprehensif tentang transformasi digital dalam sistem pendidikan di Indonesia, serta mengeksplorasi faktor-faktor yang berkontribusi terhadap keberhasilannya. Penelitian ini menggunakan pendekatan studi pustaka, dengan menggunakan tinjauan literatur dan metodologi analisis deskriptif. Temuan dalam penelitian ini mengungkapkan bahwa reformasi pendidikan yang diprakarsai oleh Kementerian Pendidikan dan Kebudayaan merupakan respons terhadap Gerakan Reformasi Pendidikan Global (GERM). Reformasi ini ditandai dengan adopsi kurikulum Merdeka dan transformasi digital, yang melibatkan intervensi teknologi, dengan meluncurkan berbagai aplikasi seperti Arkas, SiPLah, Rapor Pendidikan, dan 'Merdeka Belajar'. Intervensi teknologi telah menunjukkan dampak yang signifikan terhadap pengguna dan telah sesuai dengan tujuan yang ditetapkan. Penggabungan teknologi dalam sistem pendidikan dapat menyederhanakan proses yang panjang dan bertingkat serta mempercepat penyebaran informasi. Keberhasilan implementasi transformasi digital Kemendikbud telah menghasilkan banyak penghargaan baik di tingkat nasional maupun internasional. Faktor-faktor kunci yang mendorong keberhasilan transformasi digital ini antara lain adalah kepemimpinan transformasional dari Menteri Pendidikan dan Kebudayaan, kepala sekolah/guru, proses desain dan pengembangan transformasi digital yang melibatkan keterlibatan pengguna, dan implementasi yang kolaboratif.
Kata Kunci: transformasi digital; platform pembelajaran; reformasi edukasi

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INTRODUCTION

Is digital transformation a necessity or a compulsion? Indonesia, as a developing country, has been striving to transform its education system for a long time. This is evident from the evolution and changes in the education curriculum made several times since 1947 until now. However, tangible success has been seen recently and ironically during the global pandemic of COVID-19. The pandemic necessitated significant adjustments in the field of education (Raju et al., 2021; Zhou et al., 2020). The successful digital transformation in the field of education has occurred under the leadership of the Minister of Education, Nadiem Anwar Makarim, who is notably considered a minister without an educational background and was initially overlooked when he was appointed as the Minister of Education. This article provides an overview of whether the success of digital transformation in education, specifically in the context of learning platform transformation, comes from a coincidental momentum, or from deliberate planning and policy design to address the actual educational issues in Indonesia.

Journey of Educational Curriculum in Indonesia has a long history in the development of its educational curriculum. The following are the educational curricula that have been implemented in Indonesia since 1947 up to the latest curriculum, the Merdeka curriculum, Abdullah (2007): The 1947 Curriculum. The 1968 Curriculum. The 1975 Curriculum. The 1984 Curriculum. The 1994 Curriculum. The 2004 Curriculum. The 2006 Curriculum. The 2013 Curriculum. And the last is The Merdeka Curriculum. In February 2022, the Ministry of Education and Culture (Kemendikbud) launched the Merdeka Curriculum as part of the Merdeka Belajar program. This curriculum aims to improve the quality of learning. The Merdeka Curriculum gives educators the liberty to create quality learning that suits the needs and learning environment of the students. The characteristics of this curriculum are the development of soft skills and character, focus on essential material, and flexible learning (Kemendikbud, 2022).

The fundamental problems of education in Indonesia cannot be separated from Indonesia's character as a vast archipelagic country. Indonesia has 17,504 islands with a variety of tribes and cultures. This island model is a blessing because it makes

Indonesia culturally rich but also poses a challenge because it makes the equal distribution of facilities, infrastructure, health, and education difficult to achieve. Especially considering that Indonesia's population is one of the largest in the world, at 275.8 million in 2022. Of this number, there are 52,856,063 students in primary and secondary education, and 3,383,378 teachers actively teaching at various levels of education.

The national assessment results of 2021/2022 indicate that students in eastern Indonesia have lower literacy scores. Students from the island of Java have scores three times higher than those outside Java. This highlights the disparity in educational quality across different regions in Indonesia. The PISA (Programme for International Student Assessment) results also reveal that compared to the average scores of students from countries in the OECD (Organisation for Economic Co-operation and Development), Indonesia lags about three years behind other countries. More than half of Indonesian children aged 15 still struggle to master basic reading and arithmetic skills. According to a report written by Oliver Wyman (Wang,C, et al., 2023).

First problem, a uniform curriculum that emphasizes mastery of material, often leading teachers to disregard student comprehension levels in order to complete the curriculum. This rigid approach to standardization overlooks the diversity of student needs and limits solutions to address differences in learning abilities among various schools and regions. Second problem, uniform curriculum governance that is dictatorial. The inflexible curriculum hinders teachers' abilities to foster creativity and innovation, as they are required to perform complex administrative tasks related to teaching materials. Third problem, Teacher training in Indonesia is conducted with a top-down approach, with most control held by local governments, and the quota is limited. Restricted access to training is evidenced by the uneven distribution of training facilities in Indonesia, which are still largely centralized in Java. Fourth problem, the ingrained "comfort zone" mindset hinders teachers' motivation to actively make improvements. The last problem is administrative tasks imposed on certain teachers, particularly in preparing classroom learning materials.

According to OECD (2023), the implementation of technology greatly influences the enhancement of effectiveness and execution of public education policies across various sectors. This is accomplished by addressing three main areas. Firstly, technology assists in the supervision, monitoring, and implementation of policy measures through access to data that were previously difficult or expensive to obtain. Secondly, technology enables the use of innovative and more efficient policy instruments. Thirdly, digital channels promote engagement between the government and stakeholders. The role of technology in driving transformation and improving the quality of education is undeniable. However, it is essential to consider how to formulate educational technology in accordance with the context and challenges faced.

Literature Review

Global dynamics demand changes in various fields of life, including education. One significant issue in the movement towards education change is the Global Education Reform Movement (GERM). GERM refers to a series of education policies and reform principles that have been globally implemented since the 1980s to improve education quality and address issues faced in the public education system (Sahlberg, 2012).

GERM has influenced educational policies in various countries worldwide, including Sweden, the United States, the United Kingdom, Australia, New Zealand, and several other transitional nations. It has become policy orthodoxy in numerous countries under the influence of international institutions such as the IMF, WTO, and the World Bank. However, Finland has shown resistance to this movement. This resistance is due to the incongruity and clash of values between GERM and the values constructed within Finnish education (Putra, 2015).

GERM has been associated with several criticisms, including rendering school systems unproductive, causing teachers to abandon their profession, and leading to poor student performance. This movement has sparked debate, with some arguing that it is useful in considering current international policy trends (Elias, 2019). To date, this movement is perceived as failing to enhance quality, equality, and educational efficiency as promised (Sahlberg, 2023).

In the context of Indonesia, GERM has also influenced national education policy. It has become part of the paradigm shift in development in the 1980s, resulting in neoliberal ideas (Precalya and Darwan, 2021). GERM's influence in various countries, including Indonesia, involves standardization, accountability, and a market-oriented approach.

Transformation is deference than reform. One definition of administrative reform, as stated by Caiden, is "The artificial inducement of administrative transformation against resistance." In simple terms, administrative reform is an activity initiated by humans, not incidental, automatic, or natural, and is executed against resistance. He clearly differentiates between administrative reform and administrative change. Administrative change is an automatic organizational response to fluctuations or changes in conditions. Considering Caiden's (2017) opinion, the crucial components to consider in a reform strategy are planning the reform, implementing the reform, and managing resistance.

According to Zauhar (2007: 77), administrative reform is closely related to the concept of strategy. This process is perceived as an activity to enhance the ability to win the battle against administrative disorder and various other administrative defects commonly found in most developing countries. Osborne (2000:45) identifies five strategies in administrative reform: core strategy, consequence strategy, customer strategy, control strategy, and culture strategy.

Transformational change requires a substantial commitment from the organization's leaders. The leader and their leadership qualities determine how transformation is seriously planned or designed, established, consistently implemented, and well-managed for both supporters and opponents. Therefore, transformative leadership characteristics are needed. As stated by Seltzer and Bass (1990), a transformational leader should be able to (a) provide ideal influence (offer goals and act as a model for the change process), (b) inspire (inform subordinates about high expectations and communicate crucial aspects in an understandable manner), (c) stimulate intellectual (foster creativity, critical thinking, and problem-solving in subordinates), and (d) consider individual (pay attention to each subordinate, nurture, and provide advice).

The above characteristics are necessary in the context of leadership in the Ministry of Education, Culture, Research, and Technology (Kemendikbudristek), which is the leading sector in policy design for digital transformation, and in the leadership of educational units (schools) that drive policy implementation. Seyal (2015) provided evidence that the transformational leadership practices of school principals significantly and positively correlate with various aspects of technology integration at the school level. Echoing Seyal, several studies have shown that the transformational leadership practices carried out by school leaders are positively, directly, and indirectly related to various indicators of technology integration in the classroom (Chen, 2013; Ng, 2008; Ottestad, 2013; Vermeulen et al., 2015; 2017; Yamamoto & Yamaguchi, 2019) as reported in Schmitz et al. (2023).

Nadiem Anwar Makarim, the Minister of Education, Culture, Research, and Technology of the Republic of Indonesia, has had a significant influence on the digital transformation process in Indonesia's education sector. He has initiated several strategic changes, such as altering the logic of education management, building a support system for transformational actors (teamwork), and incorporating technology as an intervention tool to realize (technology-driven) educational transformation. Meanwhile, the role of school principals' leadership is focused on the basic perspective of building a technology platform, acting as a partner in implementing educational transformation policies, and fostering positive morals and mindsets among teachers. There is evidence that schools with leaders who adopt both bottom-up and top-down approaches (being both the subject and object of policy) that complement each other are the most successful in school reform and technology integration (Petko, Egger, Cantieni, & Wespi, 2015).

METHODS

This research employs a comprehensive literature review (desk study) combined with a descriptive analysis method as a backbone of a qualitative study, primarily generating descriptive data. As Bogdan and Taylor describe (cited in Moleong, 2000), a qualitative method is a research procedure that yields descriptive data, whether written or spoken, from individuals and observable actions. This

research employs a two-pronged approach in its literature study: 1) Theoretical Literature Examination, involves a meticulous search of information pertaining to the theoretical framework of digital transformation, transformational policy strategies, and administrative reforms, and factors influencing digital transformation, as documented in various scholarly publications; and 2) Information Inquiry, involves investigating issues, empirical data, and policies enacted by the Kemendikbudristek of Indonesia. This includes analyzing policy implementation reports, official documents issued by Kemendikbudristek, and input from policy implementers.

This paper aims to present a comprehensive overview of the best practices of the digital transformation of education in Indonesia. The triggering factors for this transformation, particularly concerning learning platforms in schools, are thoroughly discussed. The study delves into the considerations employed in designing these platforms, the strategies used in their creation, delivery, and management of resistance during the transformation process. The information and descriptions of phenomena are critically analyzed through a meticulous examination of literature studies closely tied to digital transformation practices. The derived conclusions and recommendations are the outcomes of a discourse of literature studies that juxtapose empirical data and information with developed theories, all in relation to similar previously published research.

RESULTS AND DISCUSSION

Transformational Leadership, Digitalization, and User Centric Strategy Are a Key

As technology continues to evolve at an accelerated pace, the Kemendikbudristek Dikti has been diligently broadening its digital applications. These applications not only enhance the core teaching and learning processes but also streamline ancillary educational activities such as budgeting, financial management, and procurement of goods and services. The following are some of these innovative applications:

a. Merdeka Mengajar Platform

The Merdeka Mengajar Platform is an innovative tool that empowers teachers by providing access to high-quality teaching materials and resources. It facilitates self-

paced learning, enabling teachers to access training materials anytime, anywhere, and fosters collaboration among teachers. This platform serves as a conduit for teachers to inspire their colleagues and connect with various teacher communities across Indonesia. As of July 2023, the platform boasts over 3000 self-training modules and an impressive 339 thousand contents contributed by teachers.

b. Rapor Pendidikan

The Rapor Pendidikan is a comprehensive tool that presents an evaluation of the educational system. It encompasses student learning outcomes, the learning process, equity in service quality, school management standards, and the quality of human resources within schools. Since its launch in 2022, the Rapor Pendidikan has become an invaluable resource for schools and local governments, guiding them in strategizing to enhance service quality. The data for the dashboard is sourced from various platforms including the National Assessment (AN), Basic Education Data (Dapodik), the educational data system managed by the Ministry of Religious Affairs (EMIS), Statistics Indonesia (BPS), applications for teachers and educational staff (PMM, ARKAS, and SPMPKB), the National Accreditation Agency (BAN), and tracer studies. As a primary data source, the national assessment encompasses 267,381 schools and madrasahs across all provinces in Indonesia.

There are eleven primary indicators used in the Rapor Pendidikan to provide a comprehensive overview of the quality of education in Indonesia: students' literacy skills, numeracy skills, character, school safety climate, school inclusivity climate, school diversity climate, quality of learning, absorption of vocational high school graduates, partnerships and harmonization of vocational high schools with the world of work, and school participation rates.

The Rapor Pendidikan platform provides information down to the level of educational units and local governments so that the results can be used as a basis for policy-making at educational units and local governments. The Rapor Pendidikan displays the school's achievement results in the form of main learning indicators along with root cause analysis, school planning, and improvement recommendations.

c. SIPLah and ARKAS

SIPLah is an official procurement platform for schools. Meanwhile, ARKAS is an application used for planning, administration, and reporting of school budget use. This application is a response to the problem of the large administrative burden that must be borne by school principals and teachers as managers of educational units, so they do not have enough time to prepare cutting-edge learning media and opportunities to improve their capacity. By reducing the burden of routine tasks such as planning, budgeting, and reporting, teachers and principals can allocate more time to plan learning, provide more needs to individual students. This also helps teachers create a better work-life balance and building a more substantive learning ecosystem.

Strategies to Oversee the Digital Transformation of Education in Indonesia

Transformation embodies fundamental changes and is a key characteristic of administrative reform process. In line with Caiden's (2017) assertion that administrative reform is the artificial inducement of administrative transformation against resistance, pivotal elements to be factored into steering reform tactics encompass strategizing reform plans, executing these strategies, and managing resistance.

The reform planning process entails: (a) Leveraging technology as a catalyst to expedite temporal progress and expand the reach of systemic transformation; (b) Upholding user-centric principles, not solely due to governmental mandates; (c) Fostering collaboration, continuous growth, and a focus on user needs; and (d) Evaluating user preparedness, with an orientation towards educators and school administrators, rather than students. In policy formulation, the Indonesian Ministry of Education, Culture, Research, and Technology adopts insights from teachers and principals to construct digital platforms. User behavior serves as the benchmark, with both the users and developers engaging actively from the inception and evolution of these digital platforms. Viewed through the lens of New Public Governance (NPG), policy co-production stems from a collaborative effort between the government and the community in devising and planning services (Bovaird & Löffler, 2012). This concept is further bolstered by Davies & Hentschke's (2006) contention that within the educational sphere, a synergistic alliance between the government and the

private sector is imperative to coalesce communities, resources, and capabilities to address or rectify educational challenges.

The execution of reform implementation strategies is threefold: (a) The establishment of stringent policies is vital, however, the focus remains on fostering a user-friendly environment; (b) The adoption of adaptive-iterative development, embodying a collective endeavor involving both policymakers and on-field users; (c) The incorporation of professionals, especially a Technology Team hailing from diverse sectors with prior experience in technological product development; and (d) The active participation of developers from the inception stage, transcending the conventional vendor-client relationship. This approach resonates with the perspective of McCarthy et al. (2023) who argue that Digital Transformation necessitates leaders to foster new and enhanced partnerships beyond the educational sector. This includes alliances with telecommunication companies to bolster connectivity, the integration of user identity systems with other governmental departments, and collaborations with organizations to ensure the scalability and sustainability of Digital Transformation. The Ministry of Education, Culture, Research, and Technology collaborates with a professional Technology Team, other ministries, and state-owned enterprises to develop digital platforms. From the lens of New Public Governance (NPG), co-delivery of policy implementation should be a collaborative endeavor between the government and the private sector or nonprofit organizations to ensure service delivery (Bovaird & Löffler, 2012) given the government's limited resources to supervise policy exclusively.

Resistance to change can be mitigated through strategic measures: (a) Offering incentives to teachers, such as the Professional Teacher Allowance (TPG) and Special Teacher Allowance (TKG); (b) Implementing affirmation programs in underdeveloped, remote, and border areas, such as the Bachelor's Education Program in 3T areas (SM-3T), Frontline Teacher (GGD), and special area teacher assignments; and (c) Addressing hardware limitations within the school infrastructure through effective and timely interventions.

Outcomes and Implications of Digital Transformation

As the Kemendikbudristek embarks on the journey of digitalization in education, its primary approach centers on fostering robust technological ecosystems and the development of human resources, particularly focusing on teachers and principals. A study by Wang, C, et al. (2023) underscores that technology, by providing comprehensive data, enables policy makers to fine-tune their strategies, aligning them with the dynamic needs of society. The technology deployed prioritizes the end user, creating workflows that cater to their specific needs. A 2023 survey conducted by the Segara Research Institute indicates that the user-centric Merdeka Mengajar Platform scored highly in user-friendliness (8.64), feature relevance (8.63), user interface (8.59), and integration with other platforms (8.53).

The PMM allows Kemendikbudristek to distribute information ubiquitously, ensuring its simultaneous availability to all teachers, while maintaining the integrity of the government's message. Gabriel (2022) posits that a well-crafted teacher training program for digital competency is imperative for successful adoption and usage of digital policies by classroom teachers. Addressing this requirement on a systemic level guarantee that teacher training remains consistent across the nation.

An Oliver Weyman survey reveals that the primary utilization of teaching tools encompasses accessing quality teaching materials (84%), referencing for lesson planning (77%), and tracking student progress through assessments (69%). The provision of top-tier teaching materials is key in enabling teachers to deliver optimal learning experiences, thereby reducing quality discrepancies across regions. In July 2023, data indicated that over 2.8 million teachers had engaged with the platform, with a total of 3.3 million platform downloads. About 2.2 million teachers actively leveraged the PMM to download teaching tools, utilize assessments, participate in learning communities, access content, and upload instructional videos. The platform saw 339,000 pieces of content uploaded by teachers and 803,000 pieces of teaching tool content downloaded.

The 2023 study conducted by the Segara Research Institute provides compelling evidence of the Kemendikbudristek's successful implementation of

digital applications in education. The Merdeka Mengajar Platform (PMM), in particular, has garnered resounding approval from teachers, who find the platform's teaching references, including modules, instructional materials, and books, to be beneficial in enriching their content delivery to students, earning an impressive score of 8.70 out of 10. Moreover, teachers perceive the self-training features, such as modules and webinars, as pivotal in enhancing their professional competencies, with a high rating of 8.80. The platform's widespread adoption is evident from the dramatic surge in participants, from October 2022 to 2023, reaching approximately 4.1 million, a sevenfold increase compared to the total number of offline participants in 2019. The PMM's influence extends beyond providing resources, aiding teachers in improving their digital literacy, a sentiment reflected in the high score of 8.91. Gabriel (2022) asserts the importance of training teachers to effectively utilize digital technology, emphasizing that it outweighs merely providing access to such technology.

In a parallel study, Wang, C et al. (2023) highlight the transformative impact of the PMM on the perspectives of school principals and teachers. The platform has instigated a paradigm shift, fostering an understanding that quality education should prioritize students' unique needs. This shift is poised to catalyze the next wave of pedagogical strategy enhancements. Teachers have also reported enhancements in learning experiences, student engagement, and classroom enthusiasm. A testament to the effectiveness of these digital initiatives, Indonesia's ranking in the Programme for International Student Assessment (PISA) in 2022 improved by five positions in reading and mathematics literacy and climbed six positions in science literacy. Wang, C et al.'s (2023) survey underscores the PMM's positive impact on the educational community, noting that teachers and principals report feeling inspired and a heightened sense of professional pride. This signifies the profound influence of the PMM in effecting moral changes and mindset shifts within Indonesia's education sector.

The Rapor Pendidikan Platform, a comprehensive tool encompassing 300 performance indicators, has been adopted by 548 regional administrations, 260,000 educational institutions, and approximately 598,000 education sector stakeholders.

This platform furnishes a wealth of data, including national assessment results, literacy and numeracy proficiency, character evaluation, and learning environment surveys. These resources empower every educational institution and regional government to enact targeted improvements. As of October 2023, the platform's penetration is extensive, with about 95% of primary and secondary schools integrating the Education Analytics into their systems. According to Wang, C, et al.'s (2023) study, over 80% of the surveyed population acknowledges the platform's critical role in pinpointing priority areas for improvement in the upcoming academic year, thereby facilitating data-driven decision-making.

Wang, C, et al.'s (2023) research underscores the platform's importance in identifying key areas of focus for enhancement in future academic planning. Newton, as referenced by Gabriel (2022), asserts that data-driven decision-making bolsters the precision and reliability of educational decisions across all levels and institutions. Comprehensive and timely data about students and schools, encompassing student metrics (test scores, attendance, etc.) as well as information about learning environments and resources, results in a well-rounded perspective (Marsh, Pane, Hamilton, 2006). Gabriel (2022) further elucidates that the most progressive and successful nations, including New Zealand, Scotland, and Singapore, demonstrate innovative practices in leveraging data to inform their educational strategies and implement learning analytics.

The SIPLah platform is currently utilized by over 265,000 schools and involves more than 168,000 small to medium-sized enterprises (SMEs). Meanwhile, the ARKAS platform is in use at over 221,000 schools, managing a colossal sum of 48 trillion Rupiahs within its framework. The TanyaBos platform has provided valuable information to more than 16,000 schools. Tools like ARKAS, SIPLah, and TanyaBos are instrumental for school administrators in effectively and transparently managing their budgets. As highlighted by Wang, C, et al. (2023), the SIPLah and ARKAS platforms have significantly increased financial reporting security and saved precious academic time by simplifying administrative processes. By streamlining budget planning and accountability, ARKAS and SIPLah have enhanced administrative efficiency, reducing the potential for errors and workload. This, in turn, allows

educators to invest more time and energy into their primary responsibility—classroom preparation.

The digital transition spearheaded by the Kemendikbudridtek has garnered commendation from diverse quarters. The Education Report Application earned Kemendikbudristek the prestigious Opengov Award 2023 for Innovative and Disruptive Use of Technology in the Public Sector. Prior to this, in 2021, the Data Center and Kemdikbudristekdikti were each honored with the Top Digital Awards from IT Works. In 2023, Kemendikbudristek also achieved an impressive SPBE score of 3.86, the highest among ministries/agencies and regional governments. In terms of Cyber Security Maturity from BSSN, Kemendikbudristek achieved a maturity index score of 4.41 out of 5, indicating well-structured cyber security measures, automated processes, regular formal reviews, and continuous enhancements.

CONCLUSIONS

Indonesia's educational reform serves as a response to the Global Education Reform Movement (GERM), hallmarked by the introduction of the Merdeka curriculum and a digital metamorphosis underpinned by technological interventions. The digital revolution is fortified by applications such as Arkas, SiPLah, and Tanya BOS, which have proven instrumental in aiding school administrators in the efficient and transparent management of budgets. Accompanying these are the Rapor Pendidikan, a tool offering a comprehensive overview of national assessment outcomes at both the regional and institutional levels, and the Merdeka Mengajar application, a repository of high-quality resources for educators.

These technological inclusions have garnered significant user impact and have seamlessly aligned with the outlined objectives. Their broad-based implementation has fostered inclusivity among teachers and school principals. The uniform application across diverse regions suggests that users in both metropolitan and remote areas acknowledge and appreciate its value and advantages. The integration of technology into the educational framework could effectively eliminate tedious hierarchical procedures, paving the way for expedited information dissemination.

The digital transformation spearheaded by Kemendikbudristek has been recognized with multiple awards, including the best Electronic Government System (SPBE) with a rating of 3.86, outperforming other ministries/agencies and regional governments; the Opengov Award 2023 for Innovative and Disruptive Use of Technology in the Public Sector; the IT Works TOP Digital Awards 2020; the META EDU SUMMIT TAIWAN 2020 award for Outstanding Performance for Promoting the Development of the Smart Education Industry and the Cooperation of the International Education; and third place in the ICMA 2020 Best Influencer Marketing Campaign in the Government and State-Owned Enterprise Category.

The pivotal role of transformational leadership in driving this transformation cannot be understated, with the leadership of the Minister of Education, Culture, Research, and Technology and the school principals/teachers being of paramount importance. Additional supporting factors include the co-production and co-delivery of digital transformation policies and strategies involving users, the collaborative principles, and the strategic dimension sharing in policy design planning, strategies in policy implementation, and strategies in managing policy resistance.

The limitation of the findings from this article is that the digitalization of education in question is only limited to the context of learning platforms. The user centric referred to in this article is limited to teachers and school principals as application users, these users do not include students. It is hoped that further research will be able to answer the limitations of this article, so that it can provide a reflection in describing the conditions of educational transformation more comprehensively.

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