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Implementation of Information Technology in Supporting *Kurikulum Merdeka*

[1*]Rusti Wulaningsih, [2]Usman Radiana
[12]Universitas Tanjungpura
[1*]rustiwulaningsih27@guru.smk.belajar.id, [2]usman.radiana@fkip.untan.ac.id

ABSTRACT

Background

The information technologies used include the *Platform Merdeka Mengajar* (PMM), info GTK, Learning Management System (LMS) for *Guru Penggerak*, and various digital initiatives under the Sekolah Penggerak program.

Purpose

This study aims to analyze the implementation of information technology in supporting the execution of the *Kurikulum Merdeka* in schools across Indonesia.

Design/method/approach

The research employed a qualitative approach, with data collection techniques including interviews, observations, and document analysis. Data were obtained from relevant stakeholders, such as teachers, principals, and education staff from several schools that have adopted the *Kurikulum Merdeka*.

Results

The results showed that the use of information technology has enhanced the effectiveness of teaching, facilitated collaboration among teachers, and improved access to more diverse and structured learning resources. However, the main challenges include limited infrastructure in some schools and the need to improve digital literacy among teachers and education staff.

Contribution/value

In conclusion, information technology plays a significant role in supporting the implementation of the *Kurikulum Merdeka*, but its success requires adequate infrastructure and enhanced digital skills.

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INTRODUCTION

Education in Indonesia continues to undergo various reforms in line with the times, one of which is the implementation of the *Kurikulum Merdeka*. This curriculum was developed in response to the challenges of education in the era of globalization and digitalization, which demand 21st-century skills such as creativity, collaboration, critical thinking, and digital literacy. The *Kurikulum Merdeka* offers greater freedom for teachers and students to explore their potential, focusing on the development of competencies and character, rather than solely on academic achievement. In this context, the use of information technology has become a crucial component in supporting a more flexible and effective learning process (Ramdhan, 2020).

Information technology now plays a central role in various sectors of life, including education. Numerous platforms and applications have been developed to support both online and offline teaching and learning. In Indonesia, several government initiatives through the Ministry of Education, Culture, Research, and Technology have introduced various applications and systems to support the *Kurikulum Merdeka*. The *Platform Merdeka Mengajar* (PMM), for example, is one solution designed to assist teachers in designing learning experiences tailored to students' needs. Additionally, the *Sekolah Penggerak* program and the *Guru Penggerak* LMS have been launched to promote innovation and collaboration among teachers (Quratul, 2023).

The *Platform Merdeka Mengajar* has become a key technology in the implementation of the *Kurikulum Merdeka*. Through this platform, teachers can access a variety of learning materials, lesson plans (RPP), instructional videos, and discussion forums with fellow teachers. This enables teachers to continuously develop themselves and improve the quality of their teaching, unrestricted by time and space. Additionally, teachers have greater flexibility in designing learning methods tailored to the needs of each student, allowing the principle of differentiated learning in the *Kurikulum Merdeka* to be achieved (Zaenab et al., 2023).

In addition to PMM, other technologies that play a role include Info GTK and the *Guru Penggerak* LMS. Info GTK simplifies the management of personnel and administrative data for teachers, allowing them to focus more on the teaching process. Meanwhile, the *Guru Penggerak* LMS provides a space for teachers to learn and share best practices in teaching. This system encourages the formation of a learning community among teachers, ultimately improving the quality of teaching and learning in schools. The LMS also supports continuous professional development for teachers, aligned with the flexible and student-centered approach of the *Kurikulum Merdeka* (Muthmainnatun, 2023).

However, despite the availability of various technologies, the implementation of information technology to support the *Kurikulum Merdeka* does not always run smoothly. Several common obstacles include infrastructure limitations, especially in remote areas where internet access remains a major challenge. Moreover, digital literacy among teachers and educational staff needs to be improved to ensure they can fully utilize these technologies in the learning process. Without adequate infrastructure support and enhanced digital skills, efforts to implement technology in education may be hindered. (Utami, 2022).

Therefore, in efforts to support the successful implementation of the *Kurikulum Merdeka*, synergy between the government, schools, teachers, and the community is essential. The government must ensure that technology infrastructure and internet networks are evenly available across Indonesia. Additionally, digital literacy training programs for teachers and educational staff need to be strengthened so that they are prepared to face the challenges of education in the digital era. By doing so, information technology can be optimally utilized to support the goals of the *Kurikulum Merdeka*, which aim to create independent, creative, and well-rounded students.

LITERATURE REVIEW

Kurikulum Merdeka

According to Afinni et al. (2023), the Merdeka Curriculum is an educational innovation that offers diverse intramural learning and content simplification, allowing students time to delve into each concept and enhance their skills. Its implementation in education emphasizes a student-centered approach, focusing on the experiences, interests, talents, and individual needs of each student (Zulaiha et al., 2020). When launched, the Ministry of Education and Culture stated that the Merdeka Curriculum has various advantages, including simplicity, depth of content, freedom of choice (flexibility), relevance, and a higher level of interactivity compared to the 2013 Curriculum (Damayanti et al., 2023). With these strengths, it is hoped that this curriculum can optimize the potential of both teachers and students, particularly in creating meaningful learning experiences and supporting the development of personality and character in line with the Pancasila student profile.

Information Technology

Information Technology (IT) refers to the use of computers, software, and telecommunications to store, retrieve, transmit, and manipulate data. IT plays a crucial role in various sectors, enhancing communication, efficiency, and productivity. According to Laudon and Laudon (2020), IT is fundamental for modern organizations as it supports decision-making processes and enables innovative solutions. Furthermore, the rapid advancement of IT, including cloud computing and artificial intelligence, has transformed business operations and consumer interactions (Furht, 2016). As businesses increasingly rely on technology, understanding IT's implications for data security and privacy becomes paramount (Whitman & Mattord, 2017).

METHOD

This research uses a qualitative approach with a case study method to analyze the implementation of information technology in supporting the *Kurikulum Merdeka* in several schools in Indonesia. Data were collected through in-depth interviews, observations, and document analysis from relevant stakeholders, including teachers, school principals, and educational staff. Informants were selected purposively to ensure representation from schools that have implemented technologies such as the *Platform Merdeka Mengajar* (PMM), Info GTK, the *Guru Penggerak* LMS, and the *Sekolah Penggerak* program. (Russell et al., 2000). Data analysis was conducted using thematic analysis, in which relevant findings were grouped according to categories related to the use of information technology in learning, as well as the challenges and opportunities faced in the implementation of the Kurikulum Merdeka. Data validity was reinforced through source and method triangulation.

RESULTS

The results of this study indicate that the implementation of information technology in supporting the *Kurikulum Merdeka* has a positive impact, particularly in enhancing the effectiveness of learning and accessibility to educational resources. Based on interviews and observations in several schools that have implemented the *Kurikulum Merdeka*, it was found that the *Platform Merdeka Mengajar* (PMM) is one of the most frequently used technologies by teachers. Approximately 80% of respondents reported that they regularly use PMM to access learning materials and digital resources, such as instructional videos and lesson plans (RPP). Teachers have experienced significant benefits in terms of time management and flexibility in designing student-centered learning (Aithal, 2016).

The use of the *Guru Penggerak* Learning Management System (LMS) has also proven to facilitate collaboration among teachers, both within a single school and across different schools. From the collected data, about 70% of teachers reported that they use the LMS to share best practices and learning materials. This strengthens the learning community among teachers, ultimately contributing to the improvement of teaching quality. However, challenges are still felt in several schools located in remote areas, where technology infrastructure and internet access are not yet optimal. Approximately 40% of schools in rural areas reported ongoing issues with slow internet connections, which limit the maximal utilization of technology. (Smith et al., 2005).

In addition, the Info GTK system has helped streamline the management of teacher and personnel data. Educational staff who were interviewed mentioned that this system minimizes administrative burdens, allowing teachers to focus more n teaching activities. However, another challenge identified is the low digital literacy among senior teachers. Approximately 35% of respondents aged over 50 admitted to struggling with the optimal use of technology, particularly in utilizing the features of the LMS and PMM (Afrida, 2022).

To clarify the research results, the following table presents data on the frequency of information technology usage in schools that have implemented the *Kurikulum Merdeka*:

Table 1. The frequency of information technology

Technology	Percentage of Users	Main Functions	Challenges
Platform Merdeka Mengajar (PMM)	80%	Access to materials, lesson plans (RPP), videos	Uneven internet access
LMS Guru Penggerak	70%	Collaboration among teachers, sharing materials	Low digital literacy among teachers, especially senior teachers
Info GTK	90%	Management of personnel and administrative data	Some features are difficult to access in areas with weak networks
Sekolah Penggerak Program	60%	Teacher professional development	Keterbatasan infrastruktur di sekolah terpencil

From the data above, it is clear that the majority of teachers have utilized technology to support learning, although there are still challenges related to infrastructure and digital literacy. In further discussion, it can be concluded that the effectiveness of information technology implementation is significantly influenced by the readiness of infrastructure and the digital skills of users(Pramesworo et al., 2023). In schools that have good internet access and teachers with high digital literacy, the Kurikulum Merdeka can be implemented more optimally through the use of this technology.(Sucipto et al., 2024). Conversely, in areas with infrastructure limitations, the implementation of technology is still not optimal, necessitating government intervention to improve access and digital literacy.

Furthermore, it was found that government initiatives, such as the *Sekolah Penggerak* program and the *Guru Penggerak* LMS, have significant potential in enhancing teacher professionalism. Teachers who are active on these platforms tend to be more innovative in

designing learning experiences and are open to collaborating with their peers. This program also aligns with the goals of the *Kurikulum Merdeka*, which emphasizes the importance of project-based learning and 21st-century skills.(Hawati et al., 2024).

However, these programs require further adjustments and support, particularly in ensuring that all teachers, both in remote areas and those with low digital literacy, can easily access this technology. This is crucial to ensure that the goals of the *Kurikulum Merdeka* are achieved equitably across Indonesia (Supatmi et al., 2024).

DISCUSSION

The results of this study indicate that the implementation of information technology in supporting the *Kurikulum Merdeka* has a positive impact, particularly in enhancing the effectiveness of learning and accessibility to educational resources. The use of the Merdeka Mengajar Platform (PMM), the *Guru Penggerak* Learning Management System (LMS), and Info GTK demonstrates how technology has facilitated the learning process and management of personnel in schools that have adopted the *Kurikulum Merdeka* (Dwiputra et al., 2023). These findings align with the research conducted by Setiawan et al. (2021), which states that the use of technology in education helps teachers design more flexible learning experiences that are relevant to students' needs. Teachers feel supported by the availability of digital learning materials and more efficient time management, allowing them to focus on student-centered learning. (Damayanti et al., 2023).

Furthermore, the use of the *Guru Penggerak* LMS, which facilitates collaboration among teachers and sharing of best practices, also supports the formation of a learning community among educators. These results are consistent with the study conducted by Hadi and Yusra (2022), which states that collaboration among teachers through digital platforms can enhance teaching innovation and strengthen teacher professionalism. Teachers involved in the LMS tend to be more innovative in designing learning methods and are open to project-based learning, which is one of the key characteristics of the *Kurikulum Merdeka* (Sutanto, 2024).

However, the results of this study also reveal significant challenges in the implementation of technology in remote areas, such as inadequate technology infrastructure and limited internet access. These challenges are consistent with the findings of Wahyuni et al. (2020), which state that limited internet access in Indonesia's remote areas is a major barrier to maximizing the application of educational technology. Without adequate infrastructure, teachers in these areas struggle to access digital platforms such as PMM and the *Guru Penggerak* LMS, resulting in uneven utilization of technology across schools (Zafirah et al., 2024).

In addition to infrastructure limitations, another challenge identified in this study is the low digital literacy among senior teachers. Approximately 35% of respondents aged over 50 reported difficulties in using technology optimally. This finding is supported by research from Putra et al. (2021), which states that digital literacy is a major barrier to technology adoption among older teachers. Teachers who are less familiar with technology tend to struggle with using the features of the LMS and PMM, ultimately hindering efforts to improve the quality of learning (Mutiaroh, 2020).

The *Sekolah Penggerak* program, aimed at enhancing teacher professionalism, also plays a crucial role in supporting the *Kurikulum Merdeka*. Teachers involved in this program are reported to be more active in their professional development and innovation in learning(Randall, 2005). This aligns with the findings of Arifin and Prasetyo (2022), who found that professional development programs for teachers through technology can enhance teaching skills and adaptation to new curricula. However, to maximize the potential of this program, further support

is needed in the form of ongoing digital literacy training, especially for teachers in remote areas where access to technology is still limited(Pratomo, 2016).

Overall, this study emphasizes that information technology plays a crucial role in supporting the implementation of the *Kurikulum Merdeka*, but its success greatly depends on the readiness of infrastructure and the digital literacy of teachers. The government needs to pay special attention to improving internet access in remote areas and providing comprehensive digital literacy training so that all teachers, without exception, can optimally utilize technology in the learning process.

CONCLUSION

The findings of this research indicate that the implementation of information technology plays a crucial role in supporting the execution of the *Kurikulum Merdeka* in schools across Indonesia. The use of platforms such as the *Platform Merdeka Mengajar* (PMM), LMS *Guru Penggerak*, and info GTK has proven to accelerate access to educational resources, facilitate collaboration among teachers, and reduce the administrative burden, allowing teachers to focus more on student-centered learning. However, the success of this technology implementation is highly influenced by infrastructure readiness, especially in remote areas, as well as the digital literacy of teachers, which still needs improvement, particularly among senior teachers. Therefore, to maximize the potential of technology in supporting the *Kurikulum Merdeka*, strategic measures are required from the government to enhance internet access, provide ongoing digital literacy training, and ensure that all schools, without exception, can optimally utilize technology in the learning process. With the right support, information technology can become an effective tool for promoting innovation and transforming education to meet the needs of the 21st century.

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