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DIGITALIZATION IMPLEMENTATION IN LEARNING AND SCHOOL MANAGEMENT: A QUALITATIVE STUDY AT SMA ISLAM HIDAYATULLAH SEMARANG

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ABSTRACT
This study aims to analyze the implementation of digitalization in learning and school management at SMA Islam Hidayatullah Semarang. The research employed a qualitative descriptive approach to explore in depth the processes, challenges, and impacts of digitalization within the school context. Data were collected through in-depth interviews, participant observation, and document analysis involving the principal, teachers, IT staff, and students as key informants. The findings indicate that digitalization has been systematically implemented through the use of Learning Management Systems (LMS), digital learning media, and technology-based assessment, which enhance learning flexibility, accessibility, and student engagement. In terms of school management, digitalization has improved administrative efficiency, data integration, and communication transparency. However, several challenges were identified, including limited digital competence among some teachers, variations in students' digital literacy, and infrastructural constraints such as unstable internet access. Despite these challenges, the overall response of school stakeholders was positive, reflecting a strong institutional commitment to digital transformation. This study concludes that effective digitalization requires not only technological readiness but also continuous capacity building, institutional support, and adaptive organizational culture to optimize its impact on educational quality.

INTRODUCTIONS

Digital transformation has become a strategic issue in the development of 21st-century education, driven by the rapid advancement of information and communication technology (ICT), which has significantly influenced various sectors, including education. Educational digitalization is not merely limited to the use of technological

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devices but encompasses the integration of digital systems in learning processes, administration, communication, and school management. In this context, school digitalization is understood as a systematic effort to utilize digital technology to enhance the quality of educational services, operational efficiency, and students' learning experiences (Sihotang, 2025).

Conceptually, school digitalization refers to the transformation of education through the integration of digital technology in various aspects of educational practices. According to Selwyn (2021), digitalization involves not only the use of digital tools in teaching and learning but also technology-mediated interactions among teachers, students, and parents. Similarly, Redecker et al. (2011) emphasize that digitalization represents a systemic transformation that improves teaching, learning, and school management. Furthermore, Bates (2019) argues that digitalization enables more flexible, inclusive, and personalized learning environments. Thus, school digitalization reflects a comprehensive transformation encompassing both pedagogical and managerial dimensions to improve educational quality.

In practice, school digitalization involves several key components, including digital-based management systems, innovative electronic information services, network-based learning (*e-learning*), and the development of teachers' digital competencies and students' digital literacy (Boronenko et al., 2020). It also includes organizational transformation and the integration of technology into teaching practices (Griban et al., 2019). This indicates that digitalization is not solely about technology adoption but also about transforming educational systems and cultures to become more adaptive to technological change.

The implementation of digitalization has been shown to improve learning quality through the use of interactive and adaptive digital media (Ar Rouf et al., 2026). The integration of technology also enhances students' digital literacy as an essential competency in the digital era (Intaniasari & Utami, 2022). This is consistent with Prensky (2001), who argues that digital-native students are more responsive to technology-based learning environments. Moreover, digital learning supports flexible, collaborative, and student-centered approaches (Granic & Latham, 2018; Zhao & Frank, 2021).

In addition to learning, digitalization also plays a crucial role in school management. Digital-based management systems enable more integrated, accurate, and efficient management of academic data, administration, and communication (Priyanta et al., 2024). Zhao and Frank (2021) highlight that digital management includes student data management, scheduling, assessment, and communication between schools and parents. Furthermore, digital platforms enhance transparency and support data-driven decision-making processes (Kimmons & Hall, 2020; Chai & Kim, 2020).

Despite its potential, the implementation of digitalization in education in Indonesia still faces several challenges, including infrastructure gaps, limited human resource readiness, and unequal access to technology across schools. These digital divides hinder the optimal implementation of digitalization (Nama & Tanggur, 2022). In addition, teachers' readiness in adopting digital learning remains a significant challenge, particularly in terms of digital skills and technological literacy (Petrus et al., 2022). Moreover, excessive reliance on technology may lead to reduced social interaction and increased dependency on digital devices (Garrison & Anderson, 2003; Selwyn, 2016).

On the other hand, improving teachers' digital competence is a key factor in the successful implementation of educational digitalization. Previous studies indicate that teachers' digital competence significantly influences the effectiveness of technology-based learning (Winarti et al., 2022). Therefore, strengthening teachers' capacity through training and continuous professional development is essential for supporting digital transformation in schools (El Akbar et al., 2024).

SMA Islam Hidayatullah Semarang is one of the schools that has initiated digitalization since 2019 by adopting the concept of an *Islamic Digital School*. The implementation of digitalization in this school includes not only *e-learning* but also digital-based school management systems, digital assessment, and administrative management. This indicates an integrated approach to digitalization in both learning and management aspects.

However, empirical studies that comprehensively examine school digitalization by integrating both learning and management aspects within a single analytical framework remain limited. Most existing studies tend to focus on only one aspect, resulting in a lack of holistic understanding of digitalization practices at the school level (Sitompul, 2022).

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Based on this gap, this study aims to analyze the implementation of digitalization at SMA Islam Hidayatullah Semarang, focusing on both learning and school management aspects. This study is expected to contribute empirically to the development of effective school digitalization models and serve as a reference for other educational institutions in implementing sustainable digital transformation.

METHOD

This study employed a qualitative approach with a descriptive research design. The purpose of this approach is to gain an in-depth understanding of the phenomenon of digitalization implementation at SMA Islam Hidayatullah Semarang, particularly in both learning and school management aspects. Qualitative research emphasizes the interpretation of experiences, perceptions, and social interactions within the research setting, enabling a holistic description of real conditions. Through this approach, the researcher was able to comprehensively explore how the process of digitalization implementation occurs, including its challenges and impacts on various stakeholders involved. This study was conducted at SMA Islam Hidayatullah Semarang, located at Jalan Cemara Raya No. 290, Padangsari, Banyumanik District, Semarang City. The selection of this site was based on the consideration that the school has implemented digitalization since 2019, making it relevant to the focus of this study. The research was carried out in December 2025.

The research subjects were determined using a purposive sampling technique, which involves selecting informants based on specific considerations relevant to the research objectives. The informants in this study included the principal, teachers, IT staff, and students. The principal was selected due to their strategic role in decision-making and managing school digitalization. Teachers were involved as the primary implementers of digital learning, while IT staff were responsible for managing technological systems. Students were selected as direct recipients of digitalization implementation, providing insights into technology-based learning experiences.

Data were collected using three main techniques: in-depth interviews, participant observation, and documentation study. In-depth interviews were conducted to obtain comprehensive information from informants regarding the implementation of digitalization. The interviews were semi-structured, using a systematically developed interview guide ranging from general to specific questions.

Participant observation was conducted to directly observe digital-based learning activities and school management practices. The researcher acted as a limited participant observer within the research setting to obtain authentic data.

Documentation study was conducted by analyzing relevant documents, such as school policies, work programs, and activity reports related to digitalization implementation. These three techniques were applied triangulatively to ensure more valid and comprehensive data.

The data in this study were qualitative in nature, consisting of descriptions, narratives, and information obtained from interviews, observations, and documentation. The data were categorized into primary and secondary data. Primary data were obtained directly from informants through interviews and observations, while secondary data were obtained from documents, archives, and relevant literature.

The data sources included the principal, teachers, IT staff, students, and school documents related to digitalization implementation. The collected information covered the process of digitalization implementation, challenges encountered, responses from school stakeholders, and its impact on learning and school management.

Data analysis in this study employed the interactive analysis model developed by Miles and Huberman, which consists of three main stages: data reduction, data display, and conclusion drawing. Data reduction involved selecting, focusing, and simplifying the data obtained from the field. Data display was presented in a narrative form to facilitate understanding of the research findings. Finally, conclusions were drawn gradually based on patterns and relationships identified in the data. The analysis process was conducted continuously from the data collection stage until the completion of the study.

Data validity was ensured to maintain the credibility and reliability of the research findings. Validation was conducted through triangulation techniques, which involved cross-checking data from various sources, methods, and time frames. In addition, prolonged engagement and persistent observation were applied through repeated

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observations and verification of collected data. Extended observation was also conducted to enhance data credibility, ensuring that the findings can be scientifically justified.

RESULT AND DISCUSSION

Result

Implementation of Digitalization in Learning at SMA Islam Hidayatullah Semarang

The findings indicate that the digitalization of learning at SMA Islam Hidayatullah Semarang has been systematically implemented through the utilization of various digital platforms and technology-based learning media. The school has adopted a Learning Management System (LMS) as well as digital learning applications as the primary tools to support teaching and learning activities. This is reflected in the statement of the principal:

> *"Over the past few years, we have used an e-learning system as the core of our learning process. All materials, assignments, and evaluations are already digital-based."* (KS)

In practice, teachers utilize various digital media, such as instructional videos, interactive presentations, and online platforms, to enhance the quality of learning. One teacher stated:

> *"With digital platforms, learning becomes more flexible. Students can access materials anytime, not only during classroom sessions."* (G1)

The use of digital media has been proven to increase students' engagement in the learning process. This is also supported by a student's statement:

> *"Learning through videos and applications is more interesting, so it is easier to understand compared to conventional explanations."* (S1)

In addition, digital-based assessment systems have been effectively implemented. Teachers can provide immediate feedback through digital platforms, making the evaluation process more efficient. However, the implementation of digital learning has not yet been fully optimal. Some teachers still experience difficulties in mastering technology, as stated:

> *"There are still some teachers who are not familiar with technology, so they have not fully utilized the available features."* (KS)

Implementation of Digitalization in School Management

The digitalization of school management at SMA Islam Hidayatullah Semarang has been implemented through a digital-based management information system covering academic data, administration, and school communication. This system enables data management to be more integrated and efficient.

The principal stated:

> *"All student data, attendance, and administration are managed through a digital system, making the process faster and minimizing errors."* (KS)

In addition, a digital attendance system has been implemented for both teachers and students, facilitating real-time recording of attendance. In terms of communication, the school utilizes digital platforms to deliver information to students and parents.

An IT staff member explained:

> *"We ensure that all systems run properly, from the network to the applications used by teachers and students." (SI1)*

Digitalization also enhances transparency in managing school information. However, this implementation still faces challenges, particularly in terms of system maintenance and infrastructure readiness.

Barriers and Challenges in Digitalization Implementation

The findings reveal several barriers in the implementation of digitalization at SMA Islam Hidayatullah Semarang. These include limited digital competence among some teachers, particularly in using more advanced educational technologies. In addition, differences in students' digital literacy levels also pose challenges in implementing technology-based learning.

Other challenges include infrastructural limitations, such as unstable internet connectivity and limited access to digital devices among some students. These issues affect the effectiveness of digital learning processes.

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Furthermore, adaptation is another significant challenge for both teachers and students. The transition from conventional learning systems to digital-based systems requires adjustment, which is neither immediate nor uniform, and thus requires continuous effort over time.

Response and Participation of School Stakeholders toward Digitalization

Overall, the response of school stakeholders toward digitalization at SMA Islam Hidayatullah Semarang tends to be positive. The principal plays an active role in promoting and facilitating digitalization through supportive policies and infrastructure provision.

Teachers demonstrate a relatively good level of adaptation to technology use in learning, although variations in technological proficiency still exist. Students also show enthusiasm toward digital learning, as it is perceived to be more engaging and flexible.

The role of IT staff is crucial in supporting the sustainability of digitalization, particularly in maintaining systems and resolving technical issues. In addition, parents also contribute to supporting the use of technology in learning, although not all possess the same level of capability in assisting their children.

Impact of Digitalization on Learning and School Management

The implementation of digitalization at SMA Islam Hidayatullah Semarang has generated positive impacts on both learning and school management. In the learning aspect, digitalization enhances access to learning resources, flexibility in learning time, and interactivity in the learning process.

In the management aspect, digitalization improves the efficiency of data management, accelerates administrative processes, and enhances transparency in managing school information. Digital systems also facilitate data-driven decision-making.

However, negative impacts were also identified, particularly related to increased dependence on technology and the potential reduction of direct social interaction. Therefore, digitalization implementation needs to be balanced with appropriate strategies to ensure that its benefits can be optimized.

Discussion

The findings indicate that the digitalization of learning at SMA Islam Hidayatullah Semarang has been implemented through the utilization of a Learning Management System (LMS), digital media, and technology-based assessment systems. This finding is consistent with Selwyn (2021), who argues that educational digitalization involves the transformation of technology-based learning processes. Furthermore, the use of digital media that enhances student engagement reflects a shift toward more flexible and student-centered learning. This aligns with Bates (2019) and is further supported by Ali et al. (2018), who found that digital technology significantly improves student engagement and learning outcomes through interactive, technology-based learning. The findings are also consistent with Almalki (2020), who reported that the use of LMS enhances the flexibility and effectiveness of learning. However, the disparity in teachers' digital competencies identified in this study is in line with Fisser et al. (2015), who emphasized that the success of technology integration is highly influenced by teachers' pedagogical and digital competencies.

The digitalization of school management demonstrates improved efficiency in administrative processes and data management. This finding is consistent with Zhao and Frank (2021) and is further supported by Tortorella et al. (2021), who argue that organizational digitalization enhances operational efficiency and the quality of data-driven decision-making. In addition, the use of digital systems in educational management has been shown to improve transparency and accountability. This is supported by Costa et al. (2019), who found that digital systems strengthen educational governance through data integration and improved communication. Nevertheless, reliance on digital systems also requires adequate infrastructure readiness and continuous technical support.

The findings reveal that the main barriers to digitalization implementation include teachers' digital competence, students' digital literacy, and infrastructural limitations. This is consistent with Selwyn (2016) and further supported by Zuber et al. (2020), who state that technological readiness and human resources are critical factors in the success of digital transformation in education. Moreover, Bond et al. (2018) highlight that one of the main challenges in implementing educational technology is the lack of training and teachers' pedagogical readiness. These findings

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indicate that digitalization is not merely a technological issue but also requires comprehensive human and organizational readiness.

The positive response of school stakeholders toward digitalization reflects a strong acceptance of technological innovation in education. This is consistent with Prensky (2001), who argues that digital-native generations are more adaptive to technology. The findings are also supported by Chen et al. (2020), who found that students' acceptance of technology is influenced by perceived ease of use and its usefulness in learning. Furthermore, the role of school leadership in promoting digitalization aligns with the findings of Spillane et al. (2021), who emphasize the importance of leadership in the success of digital transformation in schools.

The implementation of digitalization has had a positive impact on both learning quality and school management. This finding is consistent with Holmes et al. (2019) and further supported by Ferguson et al. (2019), who demonstrate that digital technology enhances learning quality through personalization and accessibility. However, potential negative impacts, such as increased dependence on technology and reduced social interaction, were also identified. This is in line with Garrison and Anderson (2003) and supported by Aljawarneh (2020), who argue that unbalanced use of technology may reduce the quality of social interaction in learning environments. Therefore, digitalization should be implemented in a balanced manner, considering both technological aspects and social interaction in education.

CONCLUSION

Based on the findings of this study, it can be concluded that the implementation of digitalization at SMA Islam Hidayatullah Semarang has been carried out systematically and encompasses two main aspects, namely digital learning and digital school management. In the learning aspect, digitalization is realized through the utilization of a Learning Management System (LMS), digital learning media, and technology-based assessment systems, which enhance flexibility, interactivity, and accessibility in the learning process. Meanwhile, in the school management aspect, digitalization is implemented through digital-based information systems that support the management of academic data, administration, and school communication in a more efficient, integrated, and transparent manner.

However, the implementation of digitalization has not yet been fully optimal, as it still faces several challenges, including limited digital competence among teachers, variations in students' digital literacy, and constraints related to technological infrastructure. In addition, the adaptation process to digital systems requires time and continuous support from all school stakeholders.

On the other hand, the response of school stakeholders toward digitalization tends to be positive, as reflected in increased student engagement in learning and the support provided by the principal and IT staff in developing digital systems. The implementation of digitalization has also contributed positively to improving learning quality and enhancing the efficiency of school management, although it needs to be balanced with efforts to maintain social interaction within the educational process.

Therefore, school digitalization is not merely a technological transformation but also a transformation of educational culture and systems, which requires readiness of human resources, adequate infrastructure support, and sustainable policies to achieve optimal improvements in educational quality.

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