

TECHNOLOGY AND DIGITALIZATION IN ISLAMIC EDUCATION SUPERVISION

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ABSTRACT

Supervision in Islamic education plays an important role in ensuring the quality of learning and character development of students according to Islamic values. However, conventional supervision methods are often less effective, efficient, and challenging in terms of recording and reporting. In this digital era, technology offers new ways that are easier to adapt to and more transparent in conducting supervision. This article conceptually discusses how technology and digitalization can be applied in Islamic education supervision, examining its benefits, challenges, and the best ways to implement it. The method used involves reading and analyzing various literature. The results indicate that digitalization of supervision can make the supervisor's work more efficient, enhance teacher accountability, and allow for direct monitoring of learning. Nevertheless, there are several challenges such as differences in digital skills, limited technological facilities, and the need for policies that keep pace with technological developments. This article suggests improving human resource capabilities, developing a digital supervision system that meets needs, and collaborating between educational institutions to build a good technology-based supervision system.

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1. INTRODUCTION

Supervision in Islamic education plays an important role in ensuring the quality of learning in line with Islamic values. Through supervision, the implementation of the curriculum, teaching methods, and learning assessments are regularly monitored to achieve the goals of Islamic education. Supervision is not only for control but also to nurture and develop teachers' professional abilities. In this case, supervisors play a crucial role in guiding teachers to work effectively and efficiently. However, Islamic education supervision often faces obstacles such as a lack of experts, inadequate training for supervisors, and resistance from teachers to the supervision process. The head of the

madrrasah also has a significant responsibility in leading educational changes to ensure that learning remains relevant and of high quality through structured supervision and teacher development in the use of technology. (Anwar, Yasin, & Zuhriyah, 2024).

The advancement of digital technology has brought significant changes in various fields, including education. Integrating technology into Islamic education supervision has become a necessity to make the supervision process more effective and efficient. The use of digital platforms such as Learning Management Systems (LMS), cloud-based applications, and online communication tools allows supervisors to monitor and evaluate teacher performance directly. Furthermore, technology also facilitates more organized and transparent documentation, making analysis and decision-making easier. The use of technology in educational supervision opens up new opportunities to improve efficiency and effectiveness, although it also poses challenges such as adapting to technological changes and differences in digital access. (Nazelia, Mahardika, Syamsiandari, Novitri, & Koirina, 2024).

Digital transformation in Islamic education supervision not only changes the technical way of working but also the perspective regarding teaching and management. With technology, supervisors can more easily create training programs that meet the needs of each teacher, as well as facilitate cooperation and communication between teachers and supervisors. Furthermore, technology also allows for deeper data analysis to identify trends and patterns in the teaching and learning process. This information can be used as a basis to improve and develop educational programs. Salmiarti et al. (2024) emphasizing the importance of educational supervision management models in enhancing learning effectiveness in the digital era by effectively utilizing digital technology in primary schools.

In Islamic education, the use of technology in supervision must consider Islamic values and the principles of teaching and learning in Islam. This is important so that technology not only focuses on speed and efficiency but also on spiritual and moral aspects. Therefore, a comprehensive approach that is appropriate to the context is needed in designing and implementing technology-based supervision in Islamic education. Syarif, Huda, and Hermina (2024) It states that the use of technology in Islamic education evaluation, such as e-assessment and big data, can enhance the efficiency and accessibility of evaluations, but also faces challenges in aligning technology with the principles of Islamic education.

Based on the previously explained background, this article aims to analyze how technology and digitalization play a role in the supervision of Islamic education, focusing on the existing opportunities, challenges, and the best ways to implement them. This research is expected to contribute thoughts on developing technology-based supervision ideas and provide practical benefits to improve the quality of supervision in Islamic schools. Thus, the shift in supervision through technology can become an important step in realizing Islamic education that is adaptable and of high quality in this digital era.

2. METHODS

This research uses a qualitative method with a type of literature study (library research) that is descriptive in nature. This approach is chosen to deeply explore the concepts, theories, and practices of Islamic educational supervision in relation to technology and digitalization. Data were collected by systematically searching various relevant literature, such as academic books, scientific journal articles, dissertations, and official documents that discuss Islamic educational supervision and the use of technology in education. This method allows the researcher to analyze and integrate information from various sources to build a comprehensive understanding of the studied topic (Warosari, 2022).

Data was analyzed using content analysis, which involves identifying key themes from various sources. These themes were then grouped and interpreted to produce conceptual findings. This process includes stages such as data reduction, data presentation, and drawing conclusions (Fadli, 2021). To ensure the validity of the data, source triangulation techniques were used, which involved comparing various perspectives from different literature to obtain a comprehensive and objective understanding. In addition, the analysis was conducted inductively, in order to generate new ideas or

frameworks of thought that are relevant to the challenges and opportunities of Islamic education supervision in the digital era. (Bungin, 2010).

3. FINDINGS AND DISCUSSION

3.1 *Practices of Digitalization in Educational Supervision*

3.1.1 **Example of implementation in madrasah/Islamic school**

Research conducted by (Nugroho & Hidayati, 2023) finding that the implementation of digitalization of academic supervision by school principals at SMP Muhammadiyah Al Mujahidin Gunung Kidul has successfully improved the quality of teachers' performance. This initiative, particularly through the Academic Supervision Application (ASA), enables principals to provide direct feedback more quickly and effectively to teachers. This continuously contributes to the improvement of teachers' performance. The study highlights the positive impact of digitalization on the educational environment and emphasizes the urgency of integrating technology to enhance the quality of teaching.

Moreover, the research conducted by Amin, Ayuningtyas, and Suhandiah (2023), It shows that the development of a teacher performance assessment application using the Waterfall SDLC (System Development Life Cycle) method can produce a more objective and accurate assessment process, free from calculation errors. Thus, teachers can see the results of their performance assessments transparently. The teacher performance assessment application developed using the Waterfall SDLC model successfully addressed various constraints in manual performance assessments. This Waterfall model goes through stages of requirement definition, system design, implementation, testing, as well as comprehensive system integration and testing.

This application is capable of presenting assessment results that are more objective and accurate because it minimizes calculation errors. Specifically, this application allows for the evaluation of teacher performance at SMK Siang Surabaya to be done quickly, accurately, and transparently by adopting a 360-degree assessment method. The User Acceptance Testing results show that 72% of users are satisfied because the system runs smoothly, provides quick responses, and is very helpful in the evaluation process.

3.1.2 **The digital platform used**

According Ainun et al. (2022), The emergence of modern digital technology has revolutionized the way we work, offering more effective and efficient methods compared to traditional approaches. The rapid development of technology and the expansion of digital systems in modern life have simplified various tasks. Therefore, this digitization program is specifically designed to enhance the functions and performance of educators, both in the classroom and in the school environment as a whole.

Considering the complexity of challenges in managing Islamic education in the era of globalization and technological advancement, the development of Islamic education educators through technology-based supervision becomes crucial. Digital supervision allows for systematic and continuous management, coaching, and assessment. This is achieved by utilizing various digital platforms, such as Learning Management Systems (LMS), video conferencing, and web applications. This technology facilitates interaction, monitoring, and real-time feedback delivery, making the development process of educators more effective (Setiawan, Hanifah, Chairiyah, & Warman, 2024). The academic supervision model utilizing this digital tool not only enhances teachers' abilities to integrate technology, but also plays a crucial role in improving the quality of learning and student outcomes in various Islamic educational institutions, including madrasahs, pesantrens, and Islamic schools.

The Ministry of Religious Affairs (Kemenag), under the leadership of Minister Nasaruddin Umar and Deputy Minister Romo HR Muhammad Syafi'i, has also launched the Madrasah Digital Supervision (MAGIS) application as an effort to improve the competitiveness of madrasahs through technological innovation. This system is designed to increase the efficiency and effectiveness of educational supervision in madrasahs across Indonesia. With MAGIS, supervisors can carry out their

duties in a more structured, organized, and accessible manner. This platform is not only beneficial for supervisors, but also provides significant advantages for madrasah heads and teachers. The head of the madrasa can utilize MAGIS to evaluate the management and development of the madrasa, while teachers can reflect on the learning process in the classroom and develop more relevant innovations.

3.1.3 Technology-based supervision activities

According to the school supervisor work guidelines from the Ministry of Education and Culture (2020) during the pandemic, supervisors can utilize various digital applications for coaching. For personal guidance, the applications that can be used include SMS, phone calls, WhatsApp, Google Forms, Microsoft Groups, Zoom, Google Meet, and Webex. Meanwhile, for combined coaching and supervision, supervisors can leverage applications such as WhatsApp Group (with video call feature for up to 8 people), Microsoft Groups, Google Forms, Zoom, Google Meet, and Webex (Prilianti, 2019).

The steps in digital-based supervision that can be carried out by madrasah supervisors are as follows:

1. As a coach, the school supervisor must be able to support both teachers and the head of the madrasa in carrying out their tasks from home.
2. School supervisors must choose the right and feasible online applications so that they can provide support, guidance, and even training for teachers and school principals. Platforms that can be used include Zoom, Teams, Webex, Google Classroom, and WhatsApp Video Call Group.
3. Next, arrange the schedule for academic supervision for teachers and managerial supervision for school principals.
4. During the supervision implementation, note any obstacles or challenges faced by teachers or school principals when the situation and conditions do not allow for face-to-face interaction.
5. The school supervisor then provides alternative solutions and follows up on the obstacles faced by teachers and school principals.

3.2 The Benefits of Digitalization in Supervision

3.2.1 The efficiency and effectiveness of the supervision process

The process of Islamic educational supervision using digital technology has efficiency and effectiveness in its implementation. This is in line with Hasan et al. (2021) that the technology-based supervision process can facilitate education supervisors in providing more effective guidance, help teachers integrate technology into teaching methods, and create a learning environment that meets the needs of digital generation learners. It shows that digital-based supervision not only impacts efficient and effective implementation but also has effects on learning and teaching in schools.

Furthermore, a study conducted by Praing, Rantung, and Naibaho (2023) It shows that digital technology provides significant opportunities in creating more flexible supervision methods that are relevant to the needs of students in the modern era. It is clear that implementing digital supervision plays an important role and is very helpful in the development of students. This is in line with the findings of the study Sholeh and Efendy (2023) which explains that integrating technology in Islamic education management greatly helps to improve teacher performance through administrative efficiency, better interaction with students, and implementing innovations in learning. It can be interpreted that technology-based supervision processes are aimed at minimizing teachers' workloads and facilitating communication with students.

3.2.2 Transparency and accountability of teacher performance

The benefits of digitization in supervision demand openness and accountability in teachers' performance. According to Mahmudah and Yoenanto (2023) study, that technology-based education supervision plays a role as a driver of transparency and accountability in the education system. Meanwhile, according to Akmaliah, Rahayu, and Jarya (2024) Digital-based data management in supervision allows for more systematic documentation, from teacher performance to student learning

outcomes. This not only supports better decision-making but also increases trust among all parties involved, including supervisors, teachers, and other stakeholders.

Moreover, digital supervision opens up opportunities for the development of easier and more participatory supervision models. According to Santoso et al. (2024) that the digital learning community forum helps teachers share experiences and learning strategies online, making the coaching more responsive to the needs of the times. This technological supervision is supported by several applications that have an impact on its implementation. In agreement according to Firmansyah and Cahyani (2024) which states that the use of technology such as monitoring applications, evaluation dashboards, and digital collaboration platforms provides enhanced access to transparency and accelerates data-driven decision-making. This indicates that transparency and accountability are very important in educational supervision.

3.2.3 Continuous and real-time monitoring

The continuous and real-time monitoring process in digital supervision makes it easier for supervisors. Findings from the Purnomo and Kurniawati (2020) study, explains that technology can help accelerate communication between supervisors and teachers, especially in areas that are physically hard to reach. This evidence shows the urgency of using technology-based supervision, particularly to enhance teachers' competencies in the digital era. Thus, it will demonstrate that digital education supervision has significantly impacted the improvement of learning quality, especially through the use of innovative and efficient technology. Through this transformation, supervisors have the ability to monitor teachers' performance in real-time and provide data-based feedback that is more transparent and objective.

The implementation of digital supervision requires collaboration between supervisors and teachers, aimed at ensuring that continuous and real-time monitoring can be carried out effectively and efficiently. This has been proven in research Bintang et al. (2024) It shows that technology-based supervision can provide effectiveness through ease of communication and quick and accurate feedback. From school principals to supervisors, they can monitor and mentor teachers in real-time using digital academic supervision applications such as the Academic Supervision Application (ASA) and other digital platforms, which can help make the mentoring process more responsive and sustainable.

3.2.4 Increasing the professionalism of educators

In this era of technology, educational supervision is not just a tool for monitoring, but it must become a driving force in utilizing technology to support the professional development of teachers and impact the learning process. According to Pamungkas (2023) that the implementation of technology-based supervision can help improve teachers' skills and confidence in using technology, which ultimately has a positive impact on teaching performance in the classroom. This means that the implementation of technology-era supervision is very helpful for the teaching system of teachers in schools. Meanwhile, the study of Nugroho and Hidayati (2023) explains that the digital supervision program conducted by the school principal can have a positive impact on improving the performance quality of teachers and the overall quality of education.

In addition, this digital supervision emphasizes the professionalism of teachers. Setiawan et al. (2024) research It shows that technology-based supervision for the development of Islamic education teachers has a significant positive effect on improving the quality of education and the professionalism of teachers. The key to success in its implementation depends on the cooperation between human resources, technology, and educational policies that support digital transformation.

3.3 Challenges and Obstacles

explaining that challenges in supervision will hinder supervisors from sharing knowledge for the professional development of teachers. Here are some obstacles in utilizing technology for educational supervision, namely:

3.3.1 Digital literacy gap

One of the main obstacles in implementing the digitalization of Islamic education supervision is the difference in digital capabilities (digital literacy gap) among educators. Many teachers and supervisors in Islamic schools are not yet proficient in using technology-based supervision platforms. This is due to the lack of planned and continuous training, as well as limited access to adequate technological resources. Research from Tisnawati and Sukari (2024) It also shows that many teachers struggle to adopt digital technology due to a lack of training, limited facilities, and minimal digital understanding.

This lack of digital skills not only hinders teachers in using technology but also affects the overall effectiveness of Islamic education supervision. Nur et al. (2024) It explains that teachers who are not skilled in technology will have difficulty making reports, accessing digital learning materials, and communicating with supervisors online. As a result, the supervision process becomes less efficient and not optimal in improving the quality of learning.

To address this issue, a planned effort is needed to enhance the digital capabilities of educators through ongoing training and adequate facility support. In addition, collaboration between schools, the government, and technology companies can accelerate the improvement of digital competencies among educators. This way, Islamic education supervision can run more effectively and be able to adapt to technological developments.

3.3.2 Infrastructure limitations

The limitations of technological facilities in Islamic schools pose a significant obstacle to implementing digital supervision. Some madrasahs, especially in areas far from urban centers, face issues such as frequent internet connection interruptions, a lack of adequate hardware, and minimal technical support. These conditions hinder the effective and efficient implementation of digital supervision. Ciptadi and Khozin (2025) emphasized that inadequate technological facilities often serve as the main obstacle, especially in remote or underdeveloped areas.

Furthermore, many teachers are not yet skilled enough in using digital tools in the teaching and learning process. This necessitates a proper plan and approach to address these issues, including improving technological facilities and providing technology training for teachers. (Aryanti, 2024).

To address these limitations, significant investment is needed in the development of technology facilities in Islamic schools. The government and related parties need to provide support in the form of hardware provision, improved internet access, and technical training for teachers. With adequate facilities, the supervision of Islamic education can be carried out more effectively and efficiently.

3.3.3 Resistance to rejection

Resistance to change also becomes a barrier in the digitalization process of supervision. Some teachers and supervisors feel hesitant about the use of technology in supervision because they worry that its use is complicated, feel more closely monitored, and are unsure of the results. This attitude can hinder the widespread use of technology in the practice of Islamic education supervision. Nazelia et al. (2024) emphasizing that the lack of training and access to technology, as well as the resistance to change, poses challenges in developing teachers' digital competencies in Islamic education.

This resistance often arises from an organizational culture that is not open to change and technological innovation. In addition, the lack of understanding of how technology can enhance the quality of supervision and learning also makes people reluctant to embrace it. As a result, the process of digitizing supervision is slow and uneven across Islamic schools. (Munir & Su'ada, 2024).

To address this rejection, a comprehensive approach is needed, including continuous training, support from school principals or foundations, and creating a work environment that supports innovation and adaptation to new technologies. (Soleh, 2024). In this way, teachers and supervisors can be more accepting of changes and ready to use technology in their supervisory practices.

3.3.4 Ethics and digital data security

The aspects of ethics and data security are also important factors that need to be considered in the digitalization of supervision. The use of digital platforms for supervision poses risks related to the privacy and confidentiality of teachers' and students' data. If there are no clear rules regarding data

protection and the ethical use of technology, this can raise concerns and diminish trust in the digital supervision system. Nazelia et al. (2024) emphasizes that data security and privacy are significant challenges in implementing technology in educational supervision.

Moreover, the lack of understanding of the best ways to use technology ethically and safely also poses obstacles in digital supervision. Teachers and supervisors need to be trained on the ethics of technology use, including how to protect personal data and maintain the confidentiality of important information. Without sufficient understanding, the risks of ethical breaches and data security will continue to rise.

To address these challenges, there is a need for the development of comprehensive rules on ethics and data security, as well as training for teachers and supervisors on the best ways to use technology ethically and safely. Thus, Islamic educational supervision can be carried out while maintaining the integrity and trust of all parties involved.

3.3.5 The lack of policy and regulatory support

The lack of policy support and regulations that promote digital changes in Islamic educational supervision is a major obstacle. Without policies that encourage and facilitate the use of technology in supervision, digitalization efforts will proceed slowly and unevenly. There is a need for intervention from policymakers to provide guidance, resources, and encouragement that support the implementation of technology-based supervision. (Khairunnisa, Junaidi, & Pratama, 2024) emphasizing that cooperation between the government, schools, and the community is necessary to ensure that the younger generation is prepared to face an increasingly interconnected world. Furthermore, existing policies often do not align with the specific needs and challenges faced by Islamic schools in the digitalization process.

This includes a lack of operational procedure standards, technical guidelines, and evaluation methods that are appropriate for the context of Islamic education. (Muharomi et al., 2024). As a result, Islamic schools are struggling to implement digital supervision effectively.

To overcome these obstacles, there needs to be the development of policies and regulations that are responsive to the needs of Islamic schools in the digital era. This includes the preparation of technical guidelines, the provision of resources, and the development of appropriate evaluation methods. With adequate policy support, Islamic education supervision can evolve sustainably and be able to adapt to technological advancements.

By understanding these challenges and obstacles, it is hoped that effective strategies can be formulated to address the constraints in the digitalization of Islamic education supervision, so that the supervision process can proceed more optimally and be adaptive to technological developments.

3.4 Strengthening and Optimization Strategies

Strengthening and optimizing Islamic education supervision in the digital era requires a comprehensive strategic approach that involves multiple parties. The first important step is to enhance the digital skills of supervisors and teachers through structured continuous training. According to Tisnawati and Sukari (2024), Digital skills are not only about operating devices but also about critical thinking, online collaboration, maintaining internet security, and using data correctly. Effective strategies include training in the use of technology in teaching, improving facilities, and the active role of school leaders in developing the skills of Islamic teachers to adapt to changing times. In supervision, this opens opportunities for teachers to use various technological innovations such as LMS, cloud-based supervision, and online evaluation platforms as tools for more measurable and efficient learning oversight. (Sumual, Labuan, Takalumang, Rompis, & Omkarsba, 2025).

In addition, the optimization strategy needs to be supported by adequate facilities and policies. Digital supervision will not be maximized if it is not supported by a stable and reliable system, especially in terms of internet connection, sufficient hardware, and secure data storage systems. Tisnawati and Sukari (2024) emphasizes the importance of digital integration through school policies that provide innovative space for teachers and supervisors to develop ICT-based learning methods. The government and Islamic schools are expected to develop a digital change plan that targets not

only technical outcomes but also considers the strengthening of Islamic values in the digitalization process of supervision. Here, it is crucial to combine technology and Islamic ethics, ensuring that the use of digital tools remains in line with the values of akhlakul karimah that form the foundation of Islamic education.

In the digital era, cooperation among all parties involved in education becomes the third essential strategy. In this complex digital era, strengthening supervision must involve all elements of education, including madrasa principals, teachers, supervisors, school committees, and even parents. Optimizing the role of supervision is key to improving the quality of learning. According to Misharti (2022), The development of technology provides a positive impact in advancing the learning systems in schools, and the role of supervisors is very important in enhancing teachers' abilities to utilize technology in the teaching and learning process as well as the development of students in schools. Effective supervision can stimulate teachers' motivation to master technology, identify limitations in human resources, and enhance teachers' knowledge and understanding of various technological applications that can be used in learning.

Thus, strategies for strengthening supervision in the digital age should not only focus on technical aspects but also create a sustainable quality education culture in Islamic schools. The aim is to improve teachers' professionalism in facing the challenges of learning in the digital era.

4. CONCLUSION

The digitalization of supervision in Islamic education offers significant potential to improve various important aspects such as efficiency, effectiveness, transparency, and accountability. By integrating technology, supervision becomes more responsive, direct, and aligned with the needs of teachers and students. Moreover, technology-based supervision also supports the professional development of teachers and the enhancement of learning quality through the use of digital applications, educational platforms, and data-driven evaluation systems.

Nevertheless, the implementation of this digital supervision faces various obstacles, including gaps in digital literacy, limitations in infrastructure, resistance to change, ethical and data security issues, as well as minimal policy support. Therefore, strategies to strengthen supervision must include enhancing the digital capacity of human resources, developing flexible and relevant policies, providing adequate technological facilities, and collaborating among various parties to build a culture of supervision that is professional and quality-oriented.

With a comprehensive and integrated approach, digital-based Islamic education supervision can become a strategic tool to address the challenges of education in the era of digital transformation, without overlooking the spiritual values and distinctive characteristics of Islam that are the main foundation of Islamic education.

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