

DIGITALIZATION OF PESANTREN: INTEGRATING TECHNOLOGY IN ISLAMIC LEARNING**Dwi Tuhfatus Sania (1)**

UIN Syarif Hidayatullah Jakarta (1)

dwituffatus@gmail.com (1)**Abstract**

Digitalization of pesantren is a strategic step to improve the quality of Islamic learning in the modern era. This research aims to explore how technology integration can be implemented in a pesantren environment without neglecting the traditional values that have become its identity. The methods used include literature analysis, case studies in several pesantren, and in-depth interviews with managers, teachers, and students. The results show that digitalization is able to expand access to learning resources, improve the efficiency of pesantren management, and create a more interactive learning experience. However, this process faces challenges, such as infrastructure limitations, technology skills gaps, and concerns about its impact on traditional values. To overcome these barriers, a strategy is needed that involves the provision of digital infrastructure, technology skills training, and the development of contextualized learning models. With an inclusive and value-based approach, the digitalization of pesantren can be an innovative solution in producing a generation that is religious, knowledgeable, and ready to compete at the global level.

Keywords: *pesantren, technology, islamic learning, digital transformation, education management.*

INTRODUCTION

Islamic boarding school is one of the oldest Islamic educational institutions in Indonesia that still exists and is able to survive until today. This shows that pesantren have stood the test of time, despite facing various changes in the times. The sustainability of this pesantren requires the development of technology to adapt to the modern era. Pesantren are required to be able to integrate modern cultural values without abandoning classical cultural heritage.

The hallmark of pesantren education is 24-hour or day and night education, so the pesantren curriculum is all activities carried out by students during the day and night at the pesantren. This makes an understanding that in addition to effective hours or formal activities, students are also taught many lessons of educational value such as simple life training, social life training, self-learning, self-defense training even in reality in the field, the content of this invisible curriculum (hidden curriculum) is actually a much larger portion than the visible curriculum. (Musfah: 2017)

In the historical journey of education in Indonesia, it is noted that Islamic boarding schools are written as the oldest educational institutions in Indonesia which until now stand tall and steady with their existence and consistency in maintaining the commitment of Indonesian education. Many parties believe that the emergence of Islamic boarding schools first occurred in the 15th century or about six centuries ago. The journey of Islamic boarding schools for six centuries is not a short time, but a very long journey. Within the six centuries, the boarding school has certainly passed through and communicated with various cultures and civilizations. Uniquely, this long journey did not make the boarding school collapse or disappear, instead it strengthened the existence of the boarding school in the life of the community. The existence

of Islamic boarding schools until they reach the current generation needs to be appreciated by various parties, especially from the government and the Indonesian Islamic community itself. In fact, the world Islamic community should be proud of the existence of Islamic boarding schools as a phenomenon of Islamic education treasures. If necessary, it should encourage more studies or research on boarding schools massively so that the secret of the success of boarding schools in maintaining their existence until this moment can be revealed to the public and can be used as a reference by other educational institutions.(Ziyyadul:2022)

However, the main challenge comes from the use of technology, especially the internet, by students. The internet can be a positive medium for learning, doing business, and preaching if used wisely. On the other hand, without proper understanding, the internet also has the potential to have negative and damaging impacts. Therefore, Islamic boarding schools are required to prepare themselves to face the flow of globalization and digitalization, especially in maintaining the quality of the curriculum that has been their mainstay. Public trust in the ability of Islamic boarding schools to adapt to the times remains high, one of which is seen from the independent management of education.

Currently, Islamic boarding schools still survive with three patterns of education systems, namely traditional, modern, and revivalist. Traditional Islamic boarding schools emphasize four main principles: tasamuh (tolerance), ta'addul (justice), tawazun (balance), and tawasut (moderation). Modern Islamic boarding schools focus on the relevance of education to changing times, while revivalist Islamic boarding schools emphasize the practice of pure Islamic teachings without partial interpretation.

To remain relevant, Islamic boarding schools need to take three main steps: adapting to the times, responding to the expectations of society, and maintaining their unique identity as Islamic educational institutions. Cultural transformation in Islamic boarding schools must be well designed so that these institutions can effectively face cultural changes outside the Islamic boarding school environment. As the second educational institution after the family, Islamic boarding schools have a strategic role in instilling positive values, such as the teachings of Aswaja, so that students can internalize these values naturally and develop into individuals with positive characters. (Saini: 2024)

Islamic boarding schools face major challenges in adapting technology and adjusting the curriculum to the demands of the digital era. Islamic boarding schools need to develop a harmonious approach, which is able to maintain classical values while adopting modern culture to remain relevant and maintain public trust. Cultural transformation in Islamic boarding schools must be carefully designed so that they can face changing times without losing their identity as Islamic educational institutions.

One of the challenges for kiai is optimizing the positive use of technology in education, including utilizing the internet for learning, business, and preaching purposes, while maintaining the internalization of religious values in Islamic boarding schools. Digital technology, if applied wisely, can increase the relevance and effectiveness of the Islamic boarding school curriculum without sacrificing its traditional values.

The use of appropriate technology can have a positive impact on the development of students in various aspects, such as education, entrepreneurship, and preaching. However, this requires careful policies from the kiai to reduce the potential for negative impacts. Public trust in Islamic boarding schools can be maintained if Islamic boarding schools are able to maintain a balance between preserving classical values and adapting to the needs of the digital era. (Saini: 2024)

RESEARCH METHODOLOGY

The research methodology section includes the methods and approaches used as tools to process and analyze the data. In choosing methods and approaches, the suitability of the method for the theme being discussed should also be explained.

In the research results of this Scientific Paper, the setting of the work for the writing process the main library of UIN Syarif Hidayatullah Jakarta, and other relaxing places. Other calming places. Writing began on Thursday, 19 December 2024. The writing of this scientific paper is more directed towards a qualitative approach. Descriptive approach, which is reviewed through data analysis without any addition. This research literature on relevant academic and policy publications to provide additional context and perspective. Context and additional perspectives. The research results of this scientific paper obtained Secondary data sources, or also called written data sources. Which is where this data source is obtained through a set of pre-existing information or documents, such as written data sources found in libraries and the internet, in the form of data sources. written data sources found in libraries and the internet, in the form of books, scientific magazines, theses, journals and also official documentation.

The information data used for writing this Scientific Writing research is Documentation, where data collection is analysed through several documents (the results of data analysis) that are reviewed and carried out. Data analysis that are reviewed and conducted document studies as research analysis material. This documentation is authentic evidence that can be used as a research source. Techniques The analysis technique used by researchers is the Content Analysis technique, This technique analyses research so as to produce an objective and systematic description. Systematic, so that it can facilitate the writing process to be described in depth. Analysis can also be used to draw and identify conclusions.

RESULTS AND DISCUSSION

1. Implementation of Digital Technology in Islamic Education Management

The study shows that most of the Islamic educational institutions studied have adopted digital technology in their education management, including the use of e-learning platforms to support distance and hybrid learning, especially during the COVID-19 pandemic. This finding is in line with Citra A's research, which highlights that digital technology in Islamic education expands access to education and enables more flexible and personalized learning. However, not all institutions have succeeded in implementing this technology. Some face challenges, such as limited infrastructure, especially in remote areas, and lack of training for educators in utilizing technology effectively. This emphasizes the importance of government support and policies that support infrastructure development and the development of digital competencies in various regions. (Ami: 2024)

In the digital era, Islamic educational institutions face major challenges and opportunities in integrating technology into their learning systems. One of the main strategies implemented is increasing technology training for teaching staff (Nadya: 2022), through technology workshops and courses held regularly, to ensure that teachers and lecturers have the skills needed to utilize digital education software and platforms. In addition, many institutions integrate technology-based curriculum, such as the use of digital applications and tools to support interactive learning, (Reflianto: 2018) including e-learning platforms that allow students to access materials, take online exams, and interact with teachers. The development of technological infrastructure is also very important, where several institutions have invested in high-speed internet networks, computers, digital devices, and technology laboratories (Susyanto), to support the effective implementation of technology. Collaboration with external parties, such as technology companies and other educational institutions, is also a key strategy in obtaining technical support and resources. (Ari: 2013) In addition, the implementation of project-based learning using technology can improve students' technological skills, while

fostering creativity, collaboration, and critical thinking. Islamic educational institutions also focus on developing digital learning resources that are relevant to Islamic values, such as digital textbooks, learning videos, and mobile applications that are in accordance with religious principles. The implementation of a learning management system (LMS) (Yulian: 2013) also helps in managing educational administration and makes it easier for students and teachers to monitor learning progress. Increasing parental involvement through technology is also important, where applications and communication platforms are used to monitor students' academic progress. Finally, continuous evaluation and adjustment of technology strategies are key to success in ensuring that technology continues to support the improvement of the quality of education. With these strategies, Islamic educational institutions can leverage technology to improve the quality of their learning and education management. Effective digital transformation requires commitment, collaboration, and continuous innovation from all parties involved.

The implementation of various strategies to integrate technology into Islamic education management has shown significant success. One of the main successes is the improvement of technology skills among teaching staff. Regular technology training and workshops have equipped teachers and lecturers with the knowledge and skills needed to adopt and utilize technology in the learning process. As a result, many teachers are now more confident and competent in using existing digital tools and platforms, which in turn improves the overall quality of learning. Another success is the increase in student engagement in the learning process. The use of digital tools and e-learning platforms has created a more interactive and engaging learning environment. Students now have wider access to a variety of educational resources, such as learning videos, interactive simulations, and additional materials that can be accessed anytime and anywhere. This not only enriches their learning experience but also allows for more flexible and personalized learning. However, these successes do not come without challenges. One of the main challenges is the limited technology infrastructure, especially in Islamic educational institutions located in remote or less developed areas. Many schools and madrasahs still lack stable internet access and adequate technology equipment. These infrastructure limitations hamper the ability of Islamic educational institutions to implement technology strategies effectively and equitably across their institutions.

Continuous evaluation and adjustment of the technology strategies implemented are also key to overcoming these challenges. Islamic educational institutions need to routinely evaluate the effectiveness of the technology strategies implemented, identify areas for improvement, and adjust their approaches based on feedback received from students, teachers, and parents. This adaptive and responsive approach will ensure that the technology used truly supports the improvement of the quality of education effectively. Overall, while implementing a technology transformation strategy is a challenge, the successes that have been achieved show that the effort is well worth it. With strong commitment, the right support, and an innovative approach, Islamic educational institutions can successfully integrate technology to improve the quality of their education in the digital age.

The implementation of educational technology in Islamic educational institutions faces several challenges that require in-depth attention to overcome existing obstacles and maximize the potential of technology to improve the quality of education. One of the biggest challenges is the limited technology infrastructure, especially in remote or less developed areas. Stable internet access and adequate hardware are major constraints. Without adequate access, the use of e-learning platforms, educational software, and digital communication tools will be difficult to optimize. These limitations not only hinder digital teaching, but also limit students' access to technology-based learning.

Resistance to change is also a significant barrier. The conservative organizational culture in many Islamic educational institutions often hinders the acceptance of new technologies. Teachers and administrative staff who are accustomed to traditional methods are skeptical of the benefits of technology and are reluctant to change the way they work. (Saidur: 2020) Overcoming this resistance requires a careful approach, such as effective socialization, ongoing training, and strong support from top management to demonstrate the importance of this change in improving the quality of education.

In addition, budget constraints are also a barrier to developing technological infrastructure and providing adequate training. Many Islamic educational institutions do not have sufficient funds to invest in technology, (Kariem: 2020) which ultimately makes it difficult for them to provide the hardware or software needed to support digital learning. In situations like this, educational institutions often have to seek alternative sources of funding, such as partnerships with external parties, to support their digital transformation. Without adequate financial support, efforts to integrate technology into education can be hampered.

Developing learning content that is relevant to Islamic values is also a challenge that cannot be ignored. Islamic educational institutions often have difficulty finding or creating digital learning materials that are not only interesting but also in accordance with the curriculum and Islamic principles. (Khoirun: 2021) This hinders them from providing quality learning that is in accordance with students' needs, especially in the context of education based on religious values.

In addition, the involvement of parents and local communities also plays a very important role. Lack of parental involvement in supporting their children in using educational technology can hinder the success of technology implementation. Many parents do not fully understand the benefits of technology in education, so they tend not to provide sufficient support for their children. (Taufiq: 2019) Therefore, building more effective communication with parents and increasing their understanding of the benefits of technology is an important step in increasing their participation in the learning process.

Data security and privacy issues are also issues that must be considered in the adoption of educational technology. The use of technology in education requires educational institutions to protect student, teacher, and institutional data from the risk of privacy violations or cyber attacks. (Yahya: 2018) Many Islamic educational institutions do not yet have adequate security systems to manage this data safely. Therefore, it is important for educational institutions to implement strict security policies, use secure platforms, and provide data protection training to teachers and staff.

The importance of technology skills among educators cannot be ignored. Teachers who are skilled in technology will be able to make the most of digital tools to enhance students' learning experiences. Conversely, lack of technology skills will reduce the effectiveness of technology use in learning. Therefore, continuous training and an approach that focuses on improving technology skills for educators is essential to ensure that technology can be used effectively.

Community and parent involvement in the education process also contributes greatly to the success of technology adoption. Moral support, active participation, and financial support from parents and the community can strengthen the implementation of educational technology. Therefore, building close relationships with parents and the community and increasing their participation in education is essential in creating a supportive educational ecosystem.

Lastly, data security and privacy management should be a primary concern in the adoption of educational technology. Student, teacher, and institutional data must be well protected to

avoid the risk of privacy breaches or cyberattacks. Strict security policies, use of secure platforms, and training on data protection are important steps that need to be taken to ensure the success of educational technology implementation. By considering these factors comprehensively, Islamic educational institutions can design and implement more effective and sustainable educational technology implementation strategies, which will ultimately improve the quality of education in the digital era. (Munir:2024)

2. Acceptance and Adaptation of Students and Teachers to Digital Technology

Acceptance and adaptation of students and teachers to digital technology is an important aspect in the implementation of educational technology in Islamic boarding schools and Islamic educational institutions. The increasingly developing digital transformation affects the way of learning and teaching, and the success of this adaptation is highly dependent on readiness in terms of mentality, skills, and infrastructure.

In the midst of the era of globalization, digital technology has become an inseparable part of almost all aspects of life, including education. The development of information and communication technology (ICT) has opened up opportunities for people to access information, communicate, and learn in a faster and easier way, without being constrained by space and time. (Sulaiman: 2017) In the world of education, digital technology not only enables more flexible and interactive learning, but also enables more personalized teaching. This technology facilitates faster access to information, facilitates interaction between educators and students, and offers more innovative and dynamic teaching methods.

In the world of education, especially in Madrasahs and Islamic Boarding Schools, digital technology is not only used to support the learning process but also to accelerate educational administration, data management, and learning evaluation. This technology facilitates the wider distribution of teaching materials, makes it easier to share educational resources, and allows students to learn independently and more flexibly. In other words, digital technology is an effective tool to support educational transformation in the Islamic boarding school environment without abandoning the religious values that are the core of the institution. (Badi'ah: 2021) The strategy that can be applied is the use of technology to improve the management of administration and evaluation of learning. In Islamic boarding schools and madrasahs, technology can help teachers manage student data, monitor their learning progress, and conduct more efficient evaluations. By using platforms such as Google Sheets or Microsoft Excel, grade management and assignment administration can be done digitally, reducing errors and speeding up the reporting process. This also provides an opportunity for teachers to focus more on learning and pay more attention to the individual needs of students. (Gazali: 2018) The development of digital technology in Madrasahs and Islamic Boarding Schools has opened up new opportunities to improve the quality of education. With the application of ICT, the learning process can be more effective, interactive, and relevant to the needs of the times. (PW: 2022)

The development of digital technology in Islamic Boarding Schools has shown significant progress, although there are still several challenges that must be faced. Several Islamic boarding schools have begun to integrate technology into their teaching and learning activities, such as the use of mobile applications for independent learning and the use of online platforms to provide additional learning materials. Larger and more developed Islamic boarding schools often already have websites or online learning platforms to expand the reach of materials and support distance learning. Thus, digital technology provides an opportunity to improve the quality of education in Islamic Boarding Schools, although there are challenges that must be overcome to ensure wider and more equitable adoption in all Islamic boarding schools. (Fahrurrozi: 2024)

The development of digital competencies for educators in Madrasahs and Islamic Boarding Schools does face various challenges, but solutions to these problems can be applied to ensure that technology can be used effectively in learning. (Sitompul: 2022)

3. Opportunities and Challenges of Digitalization in Maintaining the Islamic Identity of Islamic Boarding Schools

Islamic boarding schools use the Yellow Book learning method as part of a tradition that is still maintained in the world of Islamic boarding school education. The Yellow Book is a collection of classical books in Islamic religious knowledge that are often taught in traditional Islamic boarding schools. The term "yellow book" emerged because the majority of these books are printed on yellow paper, although some of them are now also printed on white paper. The yellow color of the paper of this book is a characteristic that distinguishes it from books in general.

Each Islamic boarding school has a different education system, depending on the traditions and policies they adhere to. In general, there are three education systems applied in Islamic boarding schools. First, the Non-Classical System (Bandungan and Sorogan), where a kiai teaches students using Arabic books. Students live in the Islamic boarding school and study directly with the kiai. This approach emphasizes a deeper understanding of classical Islamic texts, such as the Qur'an, hadith, and other scientific books. Second, the Weton System, which has similarities with the non-classical system, but the students do not live in the pesantren. They come on certain days of the week to study, and live around the pesantren. Third, the Pondok Pesantren System that Combines Various Systems, where the pesantren combines elements of the non-classical system and the weton system, while also providing formal education, such as madrasahs or public schools, within the pesantren complex.

In the midst of the development of the era, the world of pesantren is also not free from the influence of the digitalization of education. The development of information and communication technology, such as the internet, mobile devices, and artificial intelligence (AI), has had a major impact on the world of education. Digital technology opens up opportunities to create a more creative, participatory, and comprehensive learning experience. However, it is important to maintain a balance between the use of technology and the preservation of the traditional values of the pesantren. Pesantren must maintain the essence of religious education and Islamic values, while adopting technology to enrich the learning process. Challenges in the digitalization of education, such as limited access to technology, lack of resources, and the need to improve the competence of pesantren teachers and staff, must also be considered.

Modernization of Islamic education is important for two main reasons: first, to broaden the scope of understanding of education which was previously too focused on the interests of the afterlife, and second, to answer the challenges of the modern world and the needs of Indonesian society more comprehensively. With modernization, Islamic boarding schools and Islamic educational institutions can enrich scientific insight and combine it with contextual understanding that is relevant to the development of the times. This will enable Muslims to be better prepared to face the challenges of the times and contribute to the development of Indonesian society and nation. Modernization of Islamic education does not mean abandoning religious values, but rather enriching religious understanding with broader knowledge.

Some steps that can be taken by Islamic boarding schools to face this change include: combining tradition with technology, developing digital learning facilities, conducting training for Islamic boarding school teachers and staff, strengthening collaboration and knowledge exchange, and increasing digital literacy. It is important to note that these changes do not have

to sacrifice the identity and traditional values of Islamic boarding schools. With the right approach, Islamic boarding schools can combine tradition with modern technology, thus producing students who are not only characterful, but also intelligent and ready to face the challenges of the times. By equipping students with digital skills, such as ICT and graphic design, Islamic boarding schools provide competencies that are relevant to the digital era. These skills open up job opportunities for students in the fields of design, media, and information technology. In addition, the provision of computer rooms and internet access allows students to access various sources of knowledge more efficiently, broadening their horizons regarding religious, social, and scientific issues. The use of websites and social media is also a smart step for Islamic boarding schools in promoting the identity and activities of Islamic boarding schools, as well as disseminating information to students, parents, and the general public. It can also function as an efficient administrative tool to manage data and activities of Islamic boarding schools. (Muid, et al: 2024) Not only that, high trust among alumni of Islamic boarding schools is also one of the key factors in the network. This bond is based on shared experiences in Islamic boarding schools that emphasize the values of honesty, discipline, and togetherness. In the world of work, this trust often becomes valuable social capital, because alumni trust each other to work together on projects or businesses. They also often provide references to each other, which can help increase the credibility of alumni when looking for work or building a business. In global developments, alumni of Islamic boarding schools also play a role in strengthening international relations between Muslim communities. With more and more alumni continuing their studies or working abroad, they function as cultural and religious ambassadors, introducing Islamic boarding school traditions to the international Muslim community. This not only opens up opportunities for alumni to develop careers abroad, but also expands the international network of Islamic boarding schools as a whole, thus bringing benefits to the younger generation of students. (Zuhdi: 2021)

CONCLUSION

The application of digital technology in Islamic education management has shown significant progress. Many Islamic educational institutions have adopted digital technology in the teaching and learning process, such as the use of e-learning platforms, educational applications, and other digital media. This not only expands access to education but also allows for more flexible and personalized learning. However, challenges such as limited infrastructure, lack of technological skills among teachers, and resistance to change also still need to be overcome.

It is important for Islamic educational institutions to maintain a balance between the use of technology and the preservation of traditional values. Modernizing Islamic education does not mean abandoning religious values, but rather enriching religious understanding with broader knowledge. Therefore, it is necessary to carry out the right strategy to integrate technology into the learning process, such as training for teachers and staff, developing digital learning facilities, and strengthening collaboration and knowledge exchange.

In facing the digital era, Islamic educational institutions need to prepare themselves to face the challenges and opportunities that exist. By combining tradition with modern technology, Islamic educational institutions can produce students who are not only character-based, but also intelligent and ready to face the challenges of the times. Therefore, continuous efforts need to be made to improve the quality of education and prepare a future generation that is intelligent, character-based, and has noble morals.

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