TECHNOLOGY-BASED EDUCATION MANAGEMENT IN SALAF ISLAMIC BOARDING SCHOOLS

Sa'adatun Niswah, Nur Asiyah, Wahyudi, Nasikhin
Universitas Islam Negeri Walisongo Semarang, Indonesia

Corresponding author: niswahsaadatun@gmail.com

Abstract.

This research aims to explore how salaf pesantren that are thick with traditional nuances can manage educational technology in their environment. This qualitative research with a case study approach involves in-depth observation and interviews with kyai, pesantren administrators, teachers, and students as an important part of collecting data which is then analyzed using the Miles and Huberman model. Research conducted at the Al Fadhlu salaf Islamic boarding school, Brangsong District, Kendal Regency, shows that in managing the use of technology, pesantren packages it into online and offline learning forms. Online technology is implemented through the use of social media such as YouTube, Facebook, and Instagram as da'wah media, while offline technology management relies on simple technology such as the use of PowerPoint in learning and laptops as a means of correspondence. In the aspect of curriculum management, the findings of this study show that pesantren have developed effective strategies for technology implementation, such as providing information technology subjects to students. This finding rejects the assumption that salaf pesantren only rely on traditional learning, on the contrary, proving that even though it seems traditional, salaf pesantren still adopts and teaches technology to its students. This research makes a significant contribution by showing that the use of technology can update

education in salaf Islamic boarding schools, combining traditional values with technological advances to improve the overall quality of education.
Keywords: Education Management, technology, salaf pesantren

Abstrak.

Penelitian ini bertujuan untuk mengeksplorasi bagaimana pesantren salaf yang kental dengan nuansa tradisional dapat memanajemen teknologi pendidikan di lingkungannya. Penelitian kualitatif dengan pendekatan studi kasus ini melibatkan observasi dan wawancara mendalam dengan kyai, pengurus pesantren, guru, dan santri sebagai bagian penting untuk mengumpulkan data yang kemudian dianalisis menggunakan model Miles dan Huberman. Penelitian yang dilaksanakan di pondok pesantren salaf Al Fadhlu, Kecamatan Brangsong, Kabupaten Kendal, menunjukkan bahwa dalam memanajemen penggunaan teknologi, pesantren mengemasnya ke dalam bentuk pembelajaran daring dan luring. Teknologi daring dilaksanakan melalui penggunaan media sosial seperti YouTube, Facebook, dan Instagram sebagai media dakwah, sedangkan manajemen teknologi luring mengandalkan teknologi sederhana seperti penggunaan PowerPoint dalam pembelajaran dan laptop sebagai sarana surat menyurat. Pada aspek manajemen kurikulum, temuan penelitian ini memperlihatkan bahwa pesantren telah mengembangkan strategi efektif untuk implementasi teknologi, seperti menyediakan mata pelajaran teknologi informasi kepada santri. Temuan ini menampik asumsi bahwa pesantren salaf hanya mengandalkan pembelajaran tradisional, sebaliknya, membuktikan bahwa meskipun terkesan tradisional, pesantren salaf tetap mengadopsi dan mengajarkan teknologi kepada siswanya. Penelitian ini memberikan kontribusi signifikan dengan menunjukkan bahwa penggunaan teknologi dapat memperbarui pendidikan di pesantren salaf, menggabungkan nilai-nilai tradisional dengan kemajuan teknologi untuk meningkatkan kualitas pendidikan secara keseluruhan.
Kata kunci : Manajemen Pendidikan, teknologi, pesantren salaf

A. INTRODUCTION.

The number of Islamic boarding schools in Indonesia continues to increase, based on statistical data from the Ministry of Religious Affairs which records that until 2024 there are around 36,600 Islamic boarding schools throughout Indonesia. The number of active students reached 3.4 million, while the number of teachers (kiai/ustad) was recorded at 370 thousand. Among the hundreds of thousands of Islamic boarding schools, many have the status of salaf Islamic boarding schools, which still apply traditional learning methods (Daulay, 2019). However, these Islamic boarding schools are now faced with the challenge of rapid technological development. Technology has significant implications for learning in salaf Islamic

boarding schools, including the potential for increased access to information, administrative efficiency, and more dynamic teaching and learning interactions (Manan, 2019). However, the integration of technology also poses a challenge for salaf pesantren to maintain the classical values and teaching methods that are their hallmark (Abu Kholish & Wafa, 2022). Salaf Islamic boarding schools must adapt in a wise way in order to take advantage of technological advances without losing their essence (Sabri, 2020). Therefore, in-depth research is needed on effective technology development and implementation strategies, as well as their impact on the effectiveness of learning in salaf Islamic boarding schools, to ensure that they remain relevant and able to compete in this digital era.

Research on education management in Islamic boarding schools has discussed many important aspects in improving the quality of education and administrative efficiency. (Pramungkas, 2020) in "Information Communication Technology (ICT)-Based School Management Information System in Improving the Quality of Student Education in Islamic Boarding Schools" examines how the application of ICT can improve the quality of education in Islamic boarding schools. (Nurmadiansyah, 2016) in "Pesantren Education Management: An Effort to Advance Tradition" focuses on how effective management can advance the tradition of pesantren while facing the challenges of modernity. (Wakit, S., & Huda, 2018) in "Empowerment of Traditional Islamic Boarding School Students (Utilization of Computer Technology in the Learning of the Yellow Book)" examines the use of computer technology for the learning of the Yellow Book, emphasizing the importance of technology integration in the traditional learning process. These studies show that education management in Islamic boarding schools involves the use of technology to improve the quality of education, empowering students through technology, and efforts to advance Islamic boarding school traditions in facing modern challenges. Further research is very important to develop a more effective strategy in integrating technology with pesantren education.

This study aims to explore and analyze the use of technology in education management in salaf Islamic boarding schools with a focus on three main aspects. first, identifying the forms of use of technology that have been implemented in salaf Islamic boarding schools (M. Hasyim, 2023); second, developing effective strategies for the development and implementation of technology in education management in salaf Islamic boarding schools (Shofiyuddin & Swandari, 2021); third, assessing the implications of the use of technology on the effectiveness of education management in salaf Islamic boarding schools (Wahyudi, 2019). This research is important to be conducted in salaf Islamic boarding schools because this institution has strong traditional teaching methods and is rooted in classical culture and values, so it faces significant challenges in integrating modern technology (Muid, Arifin, & Karim, 2024). However, with the development of the digital era, technological adaptation is crucial

to improve the quality of education, administrative efficiency, and expand access to information and learning. This research is expected to provide in-depth insights into the optimal ways to combine technology with traditional teaching methods, help salaf pesantren transform without losing their essence and core values, and provide practical recommendations that can be implemented to improve the effectiveness of education management in salaf pesantren.

To achieve this goal, this study adopts Michael Fullan's Educational Change Theory. The phenomenon of the application of technology in educational management in salaf Islamic boarding schools deserves to be researched using Michael Fullan's Educational Change Theory because the complexity of the changes needed in the context of traditional education is very much in accordance with the framework offered by Fullan (Fullan, 1993). Salaf Islamic boarding schools, which have long maintained conventional teaching methods, are now faced with the challenges and opportunities presented by modern technology. According to Fullan, effective educational change requires a deep understanding of the process of initiation, implementation, and institutionalization of such change (Fullan, 1993). Applying this theory can help identify key factors that support or hinder technology adoption, including leadership roles, professional development needs, and the importance of ongoing support (Pransiska, 2023). In addition, this theory also makes it possible to evaluate how resistance to change can be managed and how technology can be integrated without eliminating the values and traditions of Islamic boarding schools. Thus, this research will not only provide in-depth theoretical insights but also practical recommendations for effective technology implementation strategies in salaf Islamic boarding schools, ensuring that the changes have a positive impact on the management and quality of education.

B. RESEARCH METHODS

This study uses a qualitative method with a case study approach to examine technology-based education management in the Al Fadhlu salaf Islamic boarding school, Brangsong district, Kendal Regency. This approach was chosen because it provides an in-depth understanding of complex phenomena in the real and specific context of salaf pesantren, which maintains traditional teaching methods while facing the challenges of modern technology. Data was collected through several techniques, namely by in-depth interviews with kyai, pesantren administrators, teachers, and students to gain first-hand views and experiences regarding the application of technology, participant observations to understand daily interactions and the use of technology in the pesantren educational environment, documentation from official records, policies, and teaching materials to identify administrative and pedagogical changes, as well as surveys to get an overview about the attitude and perception of

the entire pesantren community towards technology. The data collection mechanism begins with the selection of a representative sample, followed by the arrangement of interview and observation schedules. Interviews were recorded and transcripts were analyzed to identify key themes, while observations were recorded in detail to capture the dynamics of the learning process. Documentation is analyzed to track managerial and pedagogical changes, and surveys are analyzed descriptively to provide additional context. This holistic approach allows researchers to get a comprehensive overview of the application and impact of technology in education management in salaf Islamic boarding schools.

Table A.1 Respondents

It	Intrinsic	Profile	Age
1.	P1	Management	35 years old
2.	P2	Management	29 years old
3.	P3	Management	33 years old
4.	P4	Management	23 years old
5.	G1	Teacher	34 years old
6.	G2	Teacher	39 years old
7.	G3	Teacher	51 years old
8.	K	Kyai	57 years old
9.	S1	Students	16 years old
10.	S2	Students	18 years old

In research on technology-based education management in salaf Islamic boarding schools, data triangulation techniques are used with triangulation of sources, methods, and time. Source triangulation is carried out by collecting data from various sources, such as in-depth interviews with kiai and ustad, direct observation at the pesantren, official documentation of the pesantren, and surveys to students. This is done to ensure consistency and accuracy of information from various perspectives. The triangulation method combines various data collection techniques, such as interviews, observations, documentation, and surveys, to provide a comprehensive understanding of the phenomenon being studied. Meanwhile, time triangulation takes into account changes and developments over time in the salaf pesantren education management process. The use of triangulation aims to increase the validity and

reliability of research findings, as well as minimize bias. The data analysis technique used is Miles and Huberman, which involves data reduction, data display, and conclusion drawing/verification. Data from various sources and methods are collected, compiled, and analyzed based on emerging themes or patterns. The results of the analysis are then used to compile conclusions and verify the research findings.

This research was conducted at the Al Fadhlu Islamic Boarding School, Brangsong District, Kendal Regency, Central Java because this Islamic boarding school is a representation of the Salaf Islamic Boarding School that still maintains traditional teaching methods while facing the challenges of modern technology. Al Fadlu Islamic Boarding School is the right location for this research because it provides direct insight into how salaf Islamic boarding schools manage education management in the face of technological developments. In addition, the existence of various stakeholders in Islamic boarding schools, such as administrators, teachers, kapsek, and students, provides diverse and in-depth perspectives on the implementation of technology in education management.

The limited number of respondents, namely 4 administrators, 3 teachers, 1 kapsek, and 2 students, allowed the researcher to conduct in-depth interviews and intensive observations of each individual, so as to obtain a comprehensive understanding of the phenomenon being studied. The research period, which took place from January 2024 to May 2024, provided an opportunity for researchers to see changes and developments over time in the application of technology in Al Fadlu Islamic boarding schools, as well as to obtain consistent and accurate data through in-depth observations.

C. RESULTS

1. **Forms of using technology in education management in salaf pesantren**

The study found that in salaf pesantren, technology can be utilized in various aspects of education management to improve efficiency and effectiveness. Inthe realm of managing the use of technology, pesantren packages it into online and offline learning forms. Online technology is implemented through the use of social media such as YouTube, Facebook, and Instagram as da'wah media, while offline technology management relies on simple technology such as the use of PowerPoint in learning and laptops as a means of correspondence. In terms of curriculum management, the findings of this study show that pesantren has developed effective strategies for technology implementation, such as providing information technology subjects to students thatallow students to access learning materials flexibly and independently,

supporting the self-based learning approach embraced by salaf pesantren. In addition, technology can also be used in technology-based education management systems (SMPBT) that automate administrative processes such as student data management, lesson schedules, attendance, and academic evaluation. The integration of mobile applications can facilitate communication between administrators, teachers, and students, as well as facilitate the management of information about educational activities and developments. In addition, technology can also be applied directly in the learning process by using multimedia, digital presentations, or interactive simulations to increase student engagement and understanding. By utilizing this technology wisely, salaf pesantren can increase efficiency in education management without losing the values and traditions of education that are upheld.

Based on data obtained from P1 respondents said, in managing the use of technology, pesantren package it into online and offline learning forms. Online technology is implemented through the use of social media such as YouTube, Facebook, and Instagram as da'wah media, while offline technology management relies on simple technology such as the use of PowerPoint in learning and laptops as a means of correspondence. The implementation of the online learning platform is a progressive step in education management at salaf Islamic boarding schools, facilitating flexible and independent access to learning materials for students. With this platform, students can learn according to their own rhythm and preferences, in accordance with the self-based learning approach that is the hallmark of salaf Islamic boarding schools. Students can access learning materials whenever and wherever they are, allowing them to learn independently and tailor learning to individual needs. This not only increases the students' learning independence, but also provides opportunities for them to develop problem-solving skills, initiative, and critical thinking skills. In addition, the online learning platform also allows teachers to provide more varied and interactive learning materials, thereby improving the quality of the student learning experience. Thus, the implementation of the online learning platform not only supports the principles of salaf education that prioritizes learning independence, but also enriches the educational experience of students at salaf Islamic boarding schools.

> "This pesantren manages the use of technology through online and offline learning. Online technology uses social media such as YouTube, Facebook, and Instagram as a da'wah medium, while offline technology uses PowerPoint and laptops for learning and administration."

Meanwhile, the P2 informant stated that technology can be applied directly in the learning process among students by utilizing multimedia, digital presentations,

and interactive simulations to increase their involvement and understanding. The use of multimedia, such as educational videos and animations, can help convey the subject matter in a more engaging and easy-to-understand way, especially for complex concepts. Digital presentations, through platforms such as PowerPoint or Google Slides, allow teachers to structure the material in a structured and visual way, so that students can follow the lessons more systematically. In addition, interactive simulations offer an immersive and practical learning experience, where students can interact directly with learning materials, conduct virtual experiments, or work on exercises independently. This approach not only makes the learning process more dynamic, but also helps students develop critical thinking and problem-solving skills. Thus, the integration of technology in learning not only enriches the learning experience, but also prepares students to face challenges in the digital era.

> "The use of technology in student learning is very important. With multimedia, digital presentations, and interactive simulations, students can be more involved and understand the material better. Educational videos and animations make complex concepts easier to understand, while digital presentations help structure the material in a structured and visual way. Interactive simulations provide an immersive learning experience, allowing students to conduct virtual experiments and self-paced exercises. This not only makes learning more dynamic but also develops critical thinking and problem-solving skills, preparing students for the digital era."

Meanwhile, P3's recognition states that the Technology-Based Education Management System (SMPBT) automates various administrative processes, including student data management, lesson schedules, attendance, and academic evaluations, to create a more efficient and organized educational environment. With SMPBT, student data can be managed centrally, making it easy to access important information such as their profiles, achievements, and academic history. Lesson schedules can be automatically compiled and updated, reducing manual errors and ensuring all parties are informed on time. The attendance process, which is usually time-consuming, can be done digitally, allowing teachers to record attendance quickly and accurately and provide real-time reports to interested parties. Academic evaluation also becomes more structured with this system, where assessment, grade processing, and feedback to students can be managed efficiently. All of this not only reduces the administrative burden for teachers and staff, but also increases data transparency and accuracy. With the implementation of SMPBT, educational institutions can focus more on the quality of learning and student development, while ensuring that the administrative aspects run smoothly and efficiently.

> "The Technology-Based Education Management System (SMPBT) automates various administrative processes, such as student data management, lesson

schedules, attendance, and academic evaluation. This makes the educational environment more efficient and organized. With SMPBT, student data is centrally managed, lesson schedules are updated automatically, attendance is recorded digitally, and academic evaluations are more structured. All of this reduces administrative burden and increases transparency and data accuracy, allowing for more focus on the quality of learning and student development."

2. **Effective technology development and implementation strategies in education management in salaf Islamic boarding schools.**

The strategy for the development and implementation of effective technology in education management in salaf Islamic boarding schools needs to be designed comprehensively and gradually. First, it is important to evaluate the needs of technology by involving all stakeholders, including administrators, teachers, students, and parents, to ensure that the solutions implemented are in accordance with the real needs of the pesantren. Second, the provision of training and workshops for teachers and administrative staff to improve their digital literacy and technical skills, so that they can make optimal use of technology. Third, the development of adequate technological infrastructure, such as a stable internet network and adequate hardware, is an important foundation to support the implementation of technology. Fourth, the implementation of an integrated education management platform that includes academic information systems, e-learning, and internal communication, to increase efficiency and transparency in education management. In addition, periodic monitoring and evaluation need to be carried out to assess the effectiveness of the use of technology and make necessary improvements. Finally, building a learning culture that is adaptive to technological changes, by integrating the values of Islamic boarding schools and modern technology, so that students can develop 21st century skills without sacrificing inherited scientific traditions. With this strategy, salaf pesantren can optimize the potential of technology to improve the quality of their education.

Acknowledging this, Kyai stated that it is important to evaluate the needs of technology by involving all stakeholders, including administrators, teachers, students, and parents, so that the solutions implemented are really in accordance with the real needs of the pesantren. This active participation of all parties ensures that every aspect and unique needs of the pesantren environment are carefully taken into account. Administrators can provide insight into management and administrative constraints, while teachers can identify technical and pedagogical needs that are specific to teaching and learning. Students, as the main users of technology, can provide input on how technology can support or hinder their learning process.

Meanwhile, parents can contribute their perspective regarding the accessibility and safety of technology used by their children. By combining the views and needs of these various stakeholders, pesantren can design and implement holistic and targeted technology solutions. This comprehensive needs evaluation not only improves the effectiveness and efficiency of education management in salaf pesantren but also ensures that the implementation of technology is accepted and supported by the entire pesantren community, thereby maximizing its positive impact on the quality of education.

"Involving all stakeholders in the evaluation of technology needs is very important to ensure that the solutions implemented are in accordance with the real needs of Islamic boarding schools. The active participation of administrators, teachers, students, and parents ensures that every aspect of the pesantren environment is carefully considered. With the views and needs of various parties, we can design and implement holistic and targeted technology solutions. This will increase the effectiveness and efficiency of education management and ensure that the implementation of technology is accepted and supported by the entire pesantren community."

As stated by G1 who stated that the provision of training and workshops for teachers and administrative staff at salaf Islamic boarding schools is very important to improve their digital literacy and technical skills, so that they can make optimal use of technology. This training should be designed in a comprehensive and ongoing manner, covering the basics of using hardware and software, as well as the application of technology in an educational context. Interactive and practical workshops can help teachers understand how to integrate technology in their teaching methods, such as using e-learning platforms, multimedia, and other digital tools. In addition, administrative staff also need training to operate a technology-based education management system, such as student data management, attendance, and academic evaluation. By improving their digital literacy and technical skills, teachers and administrative staff can work more efficiently, reduce administrative workload, and focus on improving the quality of education. The training also creates a more adaptive environment to technological changes, encourages innovation, and ensures that technology implementation runs smoothly and effectively. Ultimately, this will contribute to the overall improvement of the quality of education management in salaf Islamic boarding schools, supporting a more modern and efficient learning process without neglecting traditional values that are upheld.

"Training and workshops for teachers and administrative staff at salaf Islamic boarding schools are very important to improve digital literacy and technical

skills. By understanding technology, they can optimize teaching methods and education management. This will make work more efficient, reduce administrative burden, and improve the overall quality of education, while still maintaining traditional values."

In line with this, P4 stated that the development of adequate technological infrastructure, such as a stable internet network and adequate hardware, is an important foundation to support the implementation of technology in salaf Islamic boarding schools. A robust infrastructure ensures that access to technology can be carried out smoothly and without interruption, allowing students, teachers, and administrative staff to optimize the use of digital tools in the teaching and learning process and education management. A stable internet network allows access to e-learning platforms, online resources, and efficient communication between all parties in the pesantren. Adequate hardware, including computers, tablets, and projectors, supports interactive learning activities and the delivery of more varied and engaging materials. In addition, a good infrastructure also includes security systems that protect sensitive data and information from cyber threats. This investment in infrastructure not only improves operational efficiency but also opens up opportunities for innovation and the application of more modern and effective teaching methods. With a strong technological infrastructure, salaf Islamic boarding schools can optimally integrate technology, supporting educational transformation that is in line with the development of the times without abandoning traditional values that have been adhered to for a long time.

> "The development of adequate technological infrastructure, such as a stable internet network and sufficient hardware, is the key to supporting the implementation of technology in salaf Islamic boarding schools. A robust infrastructure ensures seamless access to technology, allowing students, teachers, and administrative staff to optimize the use of digital tools. This investment in infrastructure improves operational efficiency and opens up opportunities for innovation and modern teaching methods without putting traditional values aside." – Principal

In this regard, G2 said that the implementation of an integrated education management platform that includes academic information systems, e-learning, and internal communication is very important to increase efficiency and transparency in education management in salaf Islamic boarding schools. The academic information system allows for the digital management of student data, attendance, grades, and lesson schedules, facilitating access and management of information by all related parties. The e-learning platform provides flexible access to online learning materials,

assignments, and exams, so students can learn independently and at their own pace. Integrated internal communication, through mobile applications or dedicated platforms, facilitates coordination between administrators, teachers, and students, ensuring that important information can be conveyed quickly and precisely. In addition, to ensure that the technology implemented runs effectively, periodic monitoring and evaluation must be carried out. This includes an assessment of platform usage, user satisfaction, and analysis of academic and operational performance data. The results of this monitoring can be used to make necessary improvements and adjustments, ensuring that technology continues to support and improve the quality of education. With an integrated platform and periodic evaluation, salaf pesantren can achieve more efficient, transparent, and adaptive education management to technological developments.

> "At salaf Islamic boarding schools, we believe that the implementation of an integrated education management platform is very crucial. With an integrated academic information system, e-learning, and internal communication, we increase efficiency and transparency in education management. Student data, attendance, grades, and lesson schedules are managed digitally to make it easier for all parties involved. Students can access learning materials, assignments, and exams flexibly, according to their learning rhythm. Effective internal communication via mobile applications ensures that important information is delivered quickly. Our periodic evaluations ensure that technology supports and improves the quality of education.

3. **Implications of the use of technology on the effectiveness of education management in salaf pesantren**

The use of technology in education management in salaf Islamic boarding schools has significant implications for operational effectiveness and quality of education. First, technology can improve administrative efficiency by automating routine tasks such as student data management, scheduling, and academic reporting, so that staff can focus on more important strategic tasks. Second, e-learning platforms allow for more interactive and varied material delivery, which can increase student motivation and involvement in the learning process. In addition, technology also allows easier and faster access to global educational resources, expanding students' horizons and knowledge. Third, an integrated internal communication system facilitates better coordination between administrators, teachers, and students, ensuring that important information can be disseminated quickly and accurately. This also increases transparency and accountability in the management of Islamic boarding

schools. However, the implementation of technology also requires an increase in digital literacy among teachers and students, as well as investment in adequate technological infrastructure. Thus, despite the challenges, the implications of using technology can ultimately increase the effectiveness of education management in salaf Islamic boarding schools, making them more adaptive and responsive to the times.

Kyai pesantren also said that technology can improve administrative efficiency at salaf pesantren by automating routine tasks such as student data management, scheduling, and academic reporting, so that staff can focus on more important strategic tasks. For example, by using an educational information management system, student data can be input and updated automatically, reducing human error and speeding up the administrative process. Scheduling classes and activities can also be arranged through digital platforms, ensuring optimal allocation of time and space and reducing schedule conflicts. In addition, academic reporting that usually takes a long time can be simplified with software that automatically collects and analyzes student performance data. All of this allows administrative staff to shift their focus from repetitive administrative tasks to strategic activities that can improve the quality of education, such as academic program planning, curriculum development, and service improvement for students. Thus, the application of technology in administration not only improves operational efficiency but also supports more sustainable development and is oriented towards improving the quality of education in salaf Islamic boarding schools.

> "Technology is very helpful in this pesantren. Automation of routine tasks such as student data management, scheduling, and academic reporting allows staff to focus on what's important, reduce errors, and speed up administration. Classes and activities can be scheduled through digital platforms, avoiding schedule clashes. Academic reporting is faster with software that automatically collects and analyzes data. This helps us focus on developing academic programs and improving services for students, supporting the quality of education at salaf Islamic boarding schools."

Meanwhile, S1 respondents said that e-learning platforms allow for the delivery of more interactive and varied materials, which can increase students' motivation and involvement in the learning process. Through the use of multimedia such as videos, animations, and simulations, students can understand complex concepts more easily and fun. This interactivity also allows students to actively participate in discussions, quizzes, and project-based tasks, so that they are more engaged in learning. Additionally, e-learning technology allows for easier and faster

access to global educational resources, including scientific journals, digital books, and online courses from leading universities. This not only enriches the students' insight and knowledge, but also gives them the opportunity to learn from experts and experts in various fields. Thus, the e-learning platform not only improves the quality of learning but also equips students with the necessary skills to compete in the digital era. In the context of Islamic boarding schools, the application of this technology can help integrate modern science with religious education, creating a generation of students who are intelligent and globally competitive. Therefore, the use of e-learning is a significant innovative solution in increasing the effectiveness of education in the digital era.

> "In the past, learning was really boring, now using e-learning is really cool. There are videos, animations, and even simulations, making understanding complicated lessons easier. We can also participate in discussions, quizzes, and project assignments, so we can be more active. Not only that, you can access scientific journals, e-books, and courses from abroad directly from your phone. So it's smarter, you can learn from experts from anywhere. E-learning really makes learning cool, and really helps to be competitive in this day and age."

The S2 informant said the integrated internal communication system facilitates better coordination between administrators, teachers, and students, ensuring that important information can be disseminated quickly and accurately. Through communication platforms such as instant messaging apps or web-based portals, all parties involved can easily share up-to-date information, schedules, and policies. In addition, this system also increases transparency and accountability in the management of Islamic boarding schools, because every decision and action can be tracked and accounted for. However, the implementation of technology also requires an increase in digital literacy among teachers and students, as well as investment in adequate technological infrastructure. By providing adequate training and support, pesantren can overcome these barriers and harness the full potential of an integrated internal communication system. Thus, despite the challenges, the implications of using technology can ultimately increase the effectiveness of education management in salaf Islamic boarding schools, making them more adaptive and responsive to the times.

> "Our communication system is now much smoother. Not only administrators and teachers, but all students can also quickly connect. All information, schedules, and the latest policies can be accessed directly via message or web. Explain what decision is easy, because everything can be traced. But yes, for teachers and students, they must be smarter in technology. And we also need

an okay tool. But with enough training, we can face all of this. So, this technology helps us manage pesantren more smoothly, more adaptive for the future."

D. DISCUSSION

This study found that the use of technology in education management at the Al Fadhlu Salaf Islamic Boarding School, Brangsong District, Kendal Regency is in the form of online and offline learning. Online technology is implemented through the use of social media such as YouTube, Facebook, and Instagram as da'wah media, while offline technology management relies on simple technology such as the use of PowerPoint in learning and laptops as a means of correspondence. In the aspect of curriculum management, the findings of this study show that pesantren have developed effective strategies for technology implementation, such as providing information technology subjects to students. This technology supports online learning for students flexibly and independently, in line with the salaf pesantren approach (Mukhid, 2023). The technology is used in a technology-based education management system (SMPBT) to automate administrative processes such as student data management, lesson schedules, attendance, and academic evaluations. The mobile application facilitates communication between administrators, teachers, and students, as well as facilitates the management of educational information. The use of multimedia, digital presentations, and interactive simulations in the learning process increases student engagement and understanding. The implications of the use of technology on the effectiveness of education management include improving administrative efficiency through the automation of routine tasks, allowing staff to focus on more important strategic tasks (Muhammad Hasyim, 2023). The e-learning platform provides interactive materials that increase student motivation and engagement, as well as facilitate access to global educational resources, broadening students' horizons. An integrated internal communication system ensures better coordination between administrators, teachers, and students, so that important information can be disseminated quickly and accurately (Faizin, 2023).

In addition, this study found that the strategy of developing and implementing effective technology in education management at the Salaf Al Fadhlu Islamic Boarding School, Brangsong District, Kendal Regency, involves several key steps. First, it is important to evaluate technology needs by involving all stakeholders, including administrators, teachers, students, and parents, to ensure that the solutions implemented are in accordance with the real needs of the pesantren (Sholeh et al., 2023). Second, the provision of training and workshops for teachers and

administrative staff is very important to improve their digital literacy and technical skills, so that technology can be used optimally (Adawiyah, 2022). Third, the development of adequate technological infrastructure, such as a stable internet network and adequate hardware, is an important foundation to support the implementation of technology (Hasanbasri, Algusyairi, Nurhayuni, & Mudasir, 2023). Fourth, the implementation of an integrated education management platform that includes academic information systems, e-learning, and internal communication is needed to increase efficiency and transparency in education management (Apriliani, 2024). With this strategy, pesantren can ensure the effective use of technology, improve the quality of education management, and support the academic development and digital skills of students.

The use of technology in education management in salaf pesantren is very important for several reasons. First, the implementation of platforms such as E-learning, Zoom, Classroom, and Google Forms makes it easier for students to access learning materials flexibly and independently, supporting the self-based learning approach embraced by salaf Islamic boarding schools. This gives students the opportunity to learn anytime and anywhere, according to their own learning rhythm (Nurdin, 2019). Second, the technology is used in a technology-based education management system (SMPBT) that automates administrative processes such as student data management, lesson schedules, attendance, and academic evaluation. This not only improves operational efficiency but also ensures more accurate and accessible data. The integration of mobile applications facilitates communication between administrators, teachers, and students, as well as facilitates the management of information about educational activities and developments (M. Hasyim, 2023). Third, the application of technology in the learning process through multimedia, digital presentations, or interactive simulations can increase student engagement and understanding. This makes learning more engaging and effective, and helps students develop relevant digital skills in the modern era (Muzakky, Mahmuudy, & Faristiana, 2023).

The implementation of technology in education management at the Salaf Al Fadhlu Islamic Boarding School is in line with the indicators of Michael Fullan's theory of educational change and Educational Change Theory. Fullan emphasized the importance of context, capacity, and systemic change in the adoption of technology (Fullan, 1993). Through the use of platforms such as E-learning, Zoom, Classroom, and Google Forms, this pesantren supports flexible and independent online learning, in accordance with the self-based approach adhered to. This technology is also used in technology-based education management systems (SMPBT) to automate administrative processes such as student data management, lesson schedules,

attendance, and academic evaluations, reflecting Fullan's principles of operational efficiency and transparency. The integration of mobile applications facilitates communication between administrators, teachers, and students, as well as facilitates the management of information about educational activities and developments (Ahmad Muktamar, 2023), supporting a theory of change that emphasizes the importance of communication and collaboration. In addition, the application of technology in the learning process through multimedia, digital presentations, or interactive simulations increases student engagement and understanding, reflecting Fullan's focus on improving the quality of teaching and learning (Muzakky et al., 2023). Thus, the use of this technology not only supports systemic and operational change but also improves the overall quality of education.

The strategy of developing and implementing effective technology in education management in Salaf Al Fadhlu Islamic Boarding School is in line with the indicators of Michael Fullan's educational change theory and Educational Change Theory (Fullan, 1993). Evaluate technology needs by involving all stakeholders, including administrators, teachers, students, and parents, ensuring that the solutions implemented are in accordance with the real needs of the pesantren, reflecting Fullan's principles of local context and relevance. The provision of training and workshops for teachers and administrative staff to improve their digital literacy and technical skills (Amri, Jaelani, & Hadi Saputra, 2021) is in line with Fullan's focus on capacity building, which emphasizes the importance of developing individual competencies to support change. The development of adequate technological infrastructure, such as a stable internet network and adequate hardware, is an important foundation that supports the implementation of technology (Hasanbasri et al., 2023), in accordance with Fullan's concept of systemic support necessary for effective change. The implementation of an integrated education management platform that includes academic information systems, e-learning, and internal communication increases efficiency and transparency in education management (Ahyani & Dhuhani, 2024), reflecting Fullan's principles of systemic and sustainable change. Thus, this strategy not only supports effective technological change but also promotes the improvement of quality and efficiency in the management of Islamic boarding school education, in line with the theory of Educational Change which emphasizes the importance of collaboration, capacity building, and infrastructure support to achieve a successful transformation.

The implications of the use of technology on the effectiveness of educational management in Salaf Islamic Boarding Schools are well summarized by Michael Fullan's educational change theory indicators and Educational Change Theory. Technologies such as E-learning, Zoom, Classroom, and Google from, improve

administrative efficiency by automating routine tasks, in accordance with Fullan's principle of improving operational efficiency (Fullan, 1993). The e-learning platform allows for more interactive and varied material delivery, creating student motivation and involvement in the learning process, in line with Fullan's focus on improving the quality of teaching and learning. In addition, technology allows for easier and faster access to global educational resources, expanding students' insights and knowledge (Muzakky et al., 2023), which is in line with Fullan's ideas of systemic change that result in substantial change. An integrated internal communication system facilitates better coordination between administrators, teachers, and students, ensuring that important information can be disseminated quickly and accurately, reflecting the importance of collaboration and communication in educational change theory (Sabri, 2020). Thus, the use of technology in education management in salaf pesantren not only improves operational efficiency and learning quality but also creates a foundation for sustainable systemic transformation, in line with the principles of educational change theory applied by Fullan and Educational Change Theory.

The findings in this study show similarities with the study (Rouf, A., Syukur, F., & Maarif, 2024) which explains that salaf pesantren may have a more traditional learning approach, with an emphasis on scripture-based learning and religious values, while modern pesantren may be more likely to adopt a more diverse educational approach, with more technology integration in the learning process. This is in line with (bashori, prasetyo, 2020) which states that in terms of technological infrastructure, modern Islamic boarding schools tend to have better access to modern technology such as stable internet networks and cutting-edge hardware, while salaf Islamic boarding schools may still face challenges in terms of adequate technological infrastructure. However, the findings in this study contradict the opinion (Babun Suharto, 2022) that modern Islamic boarding schools may have more professional development initiatives for staff and teachers related to digital literacy and the use of technology in education, while salaf Islamic boarding schools may focus on developing traditional skills related to religious education.

In overcoming the problem of technology gaps in salaf Islamic boarding schools, cooperation is needed between Islamic boarding schools, students, and the community as a whole (Muid et al., 2024). First, pesantren need to take policies to allocate adequate resources and budgets for technological infrastructure, such as investments in stable internet networks and necessary hardware (Muzakky et al., 2023). In addition, pesantren can develop training programs and workshops for staff and teachers to improve their digital literacy. Second, students need to actively take the initiative in utilizing available technology, both for their learning and personal development (Wakit, S., & Huda, 2018). They can take online training and courses, as

well as take advantage of available digital educational resources to broaden their horizons. Third, the community can support pesantren by providing financial assistance and support for the procurement of the necessary hardware and technological infrastructure (Muchasan, Nur Syam, & Anis Humaidi, 2024). In addition, they can help in facilitating students' access to digital educational resources and play an active role in raising awareness of the importance of technology integration in education in salaf Islamic boarding schools. With strong cooperation between pesantren, students, and the community, it is hoped that the technology gap in salaf pesantren can be effectively addressed, ensuring that pesantren remain relevant and quality in this digital era (Muhammad Hasyim, 2023).

E. CONCLUSION

This study found that salaf pesantren utilize technology in education management to improve efficiency and effectiveness. The use of technology includes an online learning platform for flexible and self-directed access, as well as a technology-based education management system that automates administrative processes. The integration of mobile applications facilitates communication between stakeholders, while direct technology is used in the learning process with multimedia and digital presentations. With wise utilization, salaf pesantren can increase efficiency without losing the upheld educational tradition. The strategy for technology development in salaf pesantren must be comprehensive. The evaluation of technology needs involves all stakeholders, while the training improves the digital literacy of staff and teachers. Adequate technological infrastructure is essential, including a stable internet network and hardware. The implementation of an integrated platform and monitoring the effectiveness of technology is an important step. Finally, building a learning culture that is adaptive to technological changes by maintaining the values and skills of 21st century pesantren is the ultimate goal of this strategy.

Research on technology-based education management in salaf pesantren has a significant contribution in describing how the application of technology can improve the efficiency and effectiveness of education in traditional environments such as pesantren. The findings of this study provide in-depth insights into various forms of technology use, including the implementation of online learning platforms, technology-based education management systems, and the application of technology directly in the learning process. By involving stakeholders such as administrators, teachers, students, and parents in evaluating technology needs, this research also highlights the importance of collaboration in adopting technology to improve education. In addition, this study shows that adequate technological infrastructure

and training for teachers and administrative staff are the key to the successful implementation of technology in salaf Islamic boarding schools. By using technology wisely, salaf pesantren can improve the quality of education without sacrificing inherited values and scientific traditions, thereby making a meaningful contribution to educational renewal in the pesantren environment and encouraging a balanced adaptation between traditional values and technological advancements.

The limitation of this study only relying on interview information from 10 respondents has a significant impact on the generalization of findings and the validity of research results. With a focus on only one pesantren, the variation in educational management practices between pesantren cannot be fully understood, and the findings of the study may not reflect the actual circumstances. In addition, the limited number of respondents may limit the representation of the data, and the information obtained from the interviews may not cover the entire spectrum of relevant views and needs. For future research, it is recommended to expand the scope of the research by involving several salaf pesantren to get a more comprehensive picture of the application of technology in education management. Additionally, the use of more diverse research methods, such as surveys and observations, can provide additional insights needed. Expanding the number of respondents and diversifying data sources will increase the confidence and validity of research findings, making it possible to draw stronger conclusions and provide more relevant recommendations for practitioners and policymakers in the context of education in salaf Islamic boarding schools.

REFERENCE

Abu Kholish, & Wafa, M. C. A. (2022). Pendidikan Multikultural di Pondok Pesantren

Tradisional dan Modern sebagai Upaya Menjaga Negara Kesatuan Republik Indonesia (Studi di Pondok Pesantren Asy Syamsuriyah Brebes). *Jurnal Ilmu Pendidikan Dan Sains Islam Interdisipliner*, *1*(1), 1–12. https://doi.org/10.59944/jipsi.v1i1.1

Adawiyah, R. (2022). *Peran literasi digital dalam pembelajaran al-quran*. Pekalongan, jawa tengah: PT. Nasya Expanding Management.

Ahmad Muktamar, Muhammad Subhan Iswahyudi, Amjad Salong, Alice Yeni Verawati Wote, Rahmatiyah Rahmatiyah, Slamet Riyadi, Maryani Kusumawati, Lilis Rohaeti, F. S. L. (2023). *MANAJEMEN PENDIDIKAN : Konsep, Tantangan, dan Strategi di Era Digital*. PT. Sonpedia Indonesia. Retrieved from https://books.google.com/books?hl=en&lr=&id=1jLbEAAAQBAJ&oi=fnd&pg=PA84&dq =penghapusan+mandatory+kesehatan+anggaran+berbasis+kinerja&ots=OdempmKPdJ &sig=aCE59UGhuzSq-oq8jr9eJOcp4JM

Ahyani, E., & Dhuhani, E. M. (2024). Transformasi Digital dalam Manajemen Perkantoran Pendidikan: Sebuah Kajian Literatur. *Jurnal Visionary : Penelitian Dan Pengembangan Dibidang Administrasi Pendidikan*, *12*(1), 205. https://doi.org/10.33394/vis.v12i1.10785

Amri, C. O., Jaelani, A. K., & Hadi Saputra, H. (2021). Peningkatan Literasi Digital Peserta Didik: Studi Pembelajaran Menggunakan E-Learning. *Jurnal Ilmiah Profesi Pendidikan*, *6*(3), 546–551. https://doi.org/10.29303/jipp.v6i3.291

Apriliani, R. (2024). Peran Teknologi Informasi Dalam Manajemen Keuangan Korporasi Modern. *Prosiding Seminar Nasional Indonesia*, *2*(1), 12–26.

Babun Suharto, E. F. (2022). DIGITAL LEARNING TRANSFORMATION AT ISLAMIC BOARDING SCHOOLS: DIGITAL-BASED LEARNING PATTERNS IN SALAF AND MODERN ISLAMIC BOARDING SCHOOLS IN JEMBER. *Journal of Positive School Psychology*, *6*, 5319–5329.

bashori, prasetyo, susanto. (2020). CHANGE MANAGEMENT TRANSFROMATION IN ISLAMIC Bashori , Muhammad Anggung Manumanoso Prasetyo , Edi Susanto , *7*(1), 84–99. https://doi.org/10.25128/2520-6230.20.1.7.UD

Daulay, H. H. P. (2019). *Pendidikan Islam di Indonesia: historis dan eksistensinya*. Prenada Media.

Faizin, M. (2023). MANAJEMEN KEUANGAN PENDIDIKAN ISLAM. Manajemen Pendidikan Islam di Era Digital.

Fullan, M. (1993). *Change Force: Probing the Depths of Educational Reform. London: Falmer Press.*

Hasanbasri, H., Algusyairi, P., Nurhayuni, N., & Mudasir, M. (2023). Sumber Daya Teknologi Terhadap Pelaksanaan Kurikulum di Era Digital. *AL-MIKRAJ Jurnal Studi*

Islam Dan Humaniora (E-ISSN 2745-4584), *4*(1), 874–888. https://doi.org/10.37680/almikraj.v4i1.4181

Hasyim, M. (2023). Penggunaan Teknologi Informasi di Pesantren. *Academia Publication*.

Hasyim, Muhammad. (2023). *Penggunaan teknologi informasi di pesantren*. Jawa timur: Academia publication.

Manan, M. A. (2019). Daya tahan dan eksistensi pesantren di era 4.0. *Jurnal Pendidikan Islam Indonesia*, 155–167.

Muchasan, A., Nur Syam, & Anis Humaidi. (2024). Pemanfaatan Teknologi di Pesantren (Dampak dan Solusi dalam Konteks Pendidikan). *INOVATIF: Jurnal Penelitian Pendidikan, Agama, Dan Kebudayaan*, *10*(1), 16–33. https://doi.org/10.55148/inovatif.v10i1.849

Muid, A., Arifin, B., & Karim, A. (2024). PELUANG DAN TANTANGAN PENDIDIKAN PESANTREN DI ERA DIGITAL (Studi Kasus di Pondok Pesantren Al-Islah Bungah Gresik). *MODELING: Jurnal Program Studi PGMI*, *11*(1), 512–530.

Mukhid, A. (2023). *Pejaminan mutu pendidikan pondok pesantren dengan teknologi pembelajaran*. Yogyakarta: Pustaka Egaliter.

Muzakky, R. M. R., Mahmuudy, R., & Faristiana, A. R. (2023). Transformasi Pesantren Menghadapi Era Revolusi Digital 4.0. *ALADALAH: Jurnal Politik, Sosial, Hukum Dan Humaniora*, *1*(3), 240–255. Retrieved from https://ejurnalqarnain.stisnq.ac.id/index.php/ALADALAH/article/view/371

Nurdin, A. (2019). *Gaya belajar santri milenial*. Jejak Publisher.

Nurmadiansyah, M. T. (2016). MANAJEMEN PENDIDIKAN PESANTREN: SUATU UPAYA MEMAJUKAN TRADISI M. Thoriq Nurmadiansyah. *Jurnal MD : Membangun Profesionalisme Keilmuan*, 95–115. Retrieved from http://ejournal.uin-suka.ac.id/dakwah/JMD/article/viewFile/998/918

Pramungkas, P. R. (2020). Sistem Informasi Manajemen Sekolah Berbasis Information Communication Technology (Ict) Dalam Peningkatkan Mutu Pendidikan Siswa Di Lingkungan Pesantren. *AFKARINA: Jurnal Pendidikan Agama Islam*, *3*(2), 1–18. Retrieved from https://ejournal.unuja.ac.id/index.php/afkarina/article/view/1402/663%0Ahttps://ejournal.unuja.ac.id/index.php/afkarina/article/view/1402

Pransiska, S. (2023). Cendikia Cendikia. *Pemanfaatan Aplikasi Mind Master Sebagai Media Pembelajaran Untuk Meningkatkan Hasil Belajar Pendidikan Agama Islam*, *1*(1), 33–42.

Rouf, A., Syukur, F., & Maarif, S. (2024). Entrepreneurship in Islamic Education Institutions: Pesantren Strategy in Responding to the Industrial Revolution 4.0. *Tafkir: Interdisciplinary Journal of Islamic Education*, 250–265.

Sabri, A. (2020). Pendidikan Islam Menyongsong Era Industri 4.0. *Deepublish.*

Shofiyuddin, M., & Swandari, T. (2021). Strategi Pengasuh Pondok Pesantren dalam Pengembangan Ekonomi Mandiri Santripreneur. *Review of Islamic Education*, *1*(1), 10–24.

Sholeh, M. I., Fathurro'uf, M., Sokip, S., Syafi'i, A., 'Azah, N., & Andayani, D. (2023). Partisipasi Stakeholder dalam Pengembangan Kurikulum Pendidikan Islam di Pesantren. *Edu Journal Innovation in Learning and Education*, *1*(2), 121–141. https://doi.org/10.55352/edu.v1i2.759

Wahyudi, I. (2019). Implementasi manajemen pendidikan tinggi berbasis Pesantren.

Wakit, S., & Huda, H. (2018). Pemberdayaan Santri Pondok Pesantren Tradisional (Pemanfaatan Teknologi Komputer Dalam Pembelajaran Kitab Kuning). *In Conference on Innovation and Application of Science and Tehnology*, *125*, 33.