

## Innovation Management Based on Technology in Islamic Education for Strengthening Science and Da'wah Culture

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### ABSTRACT

This study examines the management of technological-based innovations in Islamic education to strengthen science learning and da'wah culture at Pondok Pesantren Al-Aqobah Jombang. A descriptive qualitative approach was employed, with data collected through observation, interviews, and documentation. The innovation process consisted of four stages. Planning emphasized a vision that integrates science and da'wah through technology, supported by mass communication theory as a framework for digital da'wah strategies. Organizing included establishing a technology management team and aligning curricula with science and da'wah content. Implementation was reflected in digitalized administration, interactive learning media, and online da'wah platforms to broaden outreach. Evaluation was conducted periodically through media effectiveness, learning outcomes, and the social impact of digital da'wah. Supporting factors included leadership commitment, human resource readiness, and the relevance of communication theory. Challenges arose from limited infrastructure and uneven digital literacy among students and teachers. The study concludes that technological-based innovation management provides a strategic model for sustaining Islamic education by balancing modern scientific knowledge with da'wah culture in the digital era.

Keywords: Innovation, Islamic Education Management, Technology, Science Learning, Da'wah Culture

### Introduction

The development of information technology has brought about fundamental changes in the world of education across various countries, including Indonesia (Dike et al., 2022). The digital era presents new challenges that compel educational institutions to adapt and innovate in order to remain relevant to the needs of the times. In the context of Islamic education, technology

serves as a strategic factor that can strengthen the teaching and learning process while also expanding the scope of da'wah in modern society. The integration of technology requires not only the readiness of hardware and software but also a shift in mindset among Islamic educators to be more open to renewal.

Since ancient times, pesantren (Islamic boarding schools) have been known as educational institutions deeply committed to preserving Islamic values and the moral integrity of young generations (Ranam et al., 2021). Amid the increasingly complex development of society, pesantren are required not only to teach religious knowledge but also to equip students (santri) with scientific understanding and technological literacy. The demand for human resources who are not only religious but also academically and digitally competent presents a unique challenge for pesantren administrators in the era of globalization.

Educational innovation is a conscious and structured process aimed at introducing renewal within the learning system. In Islamic education, innovation efforts must be able to embrace various approaches in order to create an integration of religious values with mastery of modern science. This is crucial for pesantren (Islamic boarding schools) so that they can produce graduates who not only understand religion theoretically but are also able to apply technology as a medium for da'wah and self development (Arif, 2016). The use of technology in education has proven to have a significant impact on the effectiveness of the learning process. In the pesantren environment, the presence of technology carries a dual meaning: as a tool to accelerate the dissemination of knowledge and as a means to strengthen the existence of Islamic da'wah. The utilization of digital media enables both students (santri) and teachers (ustadz) to reach a wider audience, making da'wah activities no longer confined to classroom spaces but extending into the highly potential virtual world.

Innovation management in Islamic education requires careful planning based on a long term vision (R, 2021). The organizational process must involve all elements of the pesantren from the caretakers and teachers to the students and educational staff. The implementation of technology based innovation management must still adhere to spiritual values so that every policy taken supports two main goals simultaneously: strengthening science learning and deepening the culture of da'wah.

The application of technological innovation in Islamic education at pesantren cannot be separated from the understanding of the innovation diffusion process as described by Rogers (2013). According to Rogers, the diffusion of innovation occurs through five stages: knowledge, persuasion, decision, implementation, and confirmation (Putra et al., 2023). These five stages serve as a reference for analyzing the dynamics of change within pesantren, starting from the emergence of awareness and understanding of technology, changes in attitudes and acceptance of innovation, institutional decision-making processes to adopt technology, to the evaluation and reinforcement of the implemented innovation. In the context of Pondok Pesantren Al-Aqobah Jombang, all these stages of innovation diffusion are clearly reflected in the systematic efforts made by the leaders, teachers (ustadz), and students (santri) to strengthen science learning programs and technology based da'wah.

In line with this, mass communication serves as the backbone for the implementation of digital da'wah and technology-based educational innovation in pesantren. Based on Islamic perspectives on mass communication, it is defined as the process of delivering messages widely to society through various media channels whether print, electronic, or digital. Mass communication is characterized by its indirect, one-way, open nature, and its ability to reach a broad and heterogeneous audience (Rosyidi, 2021). Its functions include providing information, persuasion, entertainment, cultural transmission, social integration, and social control all carried out through the media as an important institution in society. In Islamic principles, mass communication must uphold the values of truth (qaulan sadidan), gentleness (qaulan layyinan), clarity (qaulan baligha), goodness (qaulan ma'rufa), dignity (qaulan karima), and ease (qaulan maysura), as well as the principles of caution and verification (tabayyun) before delivering messages to the public (Mubasyaroh, 2017).

One example of implementing technology based innovation management in Islamic education can be seen at Pondok Pesantren Al-Aqobah Jombang. This institution strives to create synergy between scientific and Islamic materials through various digital breakthroughs. Integration is carried out by adapting technological tools in administrative processes, developing learning materials, and conducting da'wah activities through social media and online learning platforms. This effort serves as evidence that pesantren are not merely surviving but are also evolving in response to the demands of the times.

The application of mass communication principles in digital da'wah at pesantren is of utmost importance, where every Islamic message, scientific education, and even information about pesantren governance must be delivered effectively, ethically, and meaningfully. Technology based innovation enables pesantren to create da'wah content that is accessible, communicative, and aligned with the diverse and pluralistic character of the digital public. The values of mass communication in Islam frame every pesantren interaction to remain ethical, focused on public benefit, and ensure message accuracy (*tabayyun*), so that da'wah and learning activities can proceed effectively and responsibly (Afifi & Nuryana Kurniawan, 2021).

However, the implementation of digital innovation in pesantren is not without challenges. Many pesantren in Indonesia still face limitations in technological infrastructure and unequal digital literacy distribution. Differences in students' backgrounds, limited devices, and less optimal policy support often hinder innovation efforts. Additionally, resistance to change may arise due to concerns about the potential loss of pesantren's traditional identity.

Therefore, every step of innovation in technology-based Islamic education management must consider the preservation of local values and the harmonization of policies with pesantren principles. Digital transformation should not be seen as a process of replacing tradition, but rather as an effort to enrich methods of da'wah and learning while maintaining the Islamic essence that has long served as the solid foundation for the santri generation.

Science is not positioned as an entity separate from religion within the framework of Islamic education; rather, it serves as an essential element in understanding the greatness of Allah and actualizing the values of *tauhid* in daily

life. Strengthening science through technological approaches enables students (*santri*) to gain broader and more comprehensive insights. Thus, the learning process becomes an opportunity to reinforce spirituality while simultaneously enhancing scientific competitiveness.

The importance of mass communication in digital *da'wah* has become inevitable in the era of information openness (Alip Nur Yanto et al., 2023). Through social media platforms, *da'wah* websites, and other online applications, pesantren can expand their audience and effectively strengthen Islamic messages. Mass communication theory emphasizes the effectiveness of message dissemination and the broad reach of audiences through technological media. By utilizing digital platforms such as social media, websites, online learning applications, and *da'wah* streaming channels, pesantren have adopted mass communication strategies to enhance the effectiveness of education and *da'wah*. Consequently, the use of communication technology not only broadens the scope of science teaching and *da'wah*, but also fosters a pesantren culture that is more inclusive, open to change, and capable of interacting with communities beyond the pesantren environment across generations and geographical boundaries.

The success of technology based Islamic education innovation management requires the presence of a well structured management system. The four main stages planning, organizing, implementation, and evaluation must be realized in pesantren development policies. Professional management enables pesantren to adopt technology without losing their distinctive cultural identity and traditional system.

Planning serves as a crucial starting point in the implementation of innovation management. The formulation of an integrative vision that combines the strengthening of scientific materials and *da'wah* through digital media must be designed collectively as a form of shared commitment. The organizing stage is then carried out by forming an educational technology team that functions as both the driving force and the supervisor of each innovative breakthrough implementation.

The implementation stage of technology based Islamic education innovation includes the digitalization of academic administrative systems, the use of interactive learning media, and the integration of *da'wah* activities into various online platforms. This implementation must be supported by human resources who are adaptive and ready to develop their digital competencies. Regular evaluations are essential to assess the effectiveness of innovations and their impact on achieving educational and *da'wah* goals.

The key factors determining the success of Islamic education innovation in pesantren include the strength of leadership, the readiness of human resources, and the relevance of the technology used to the learning needs. On the other hand, the major obstacles often lie in weak infrastructure, limited internet access, and disparities in digital skills among pesantren members. These challenges must be addressed through sustainable strategies based on comprehensive collaboration.

Building on these opportunities and challenges, this journal research focuses on analyzing how technology-based innovation management is implemented in the environment of Pondok Pesantren Al-Aqobah Jombang. The study not only highlights managerial stages but also evaluates the effectiveness of

innovations and their influence on the development of science learning and the expansion of *da'wah* culture in an increasingly digital society.

## Method

This study employs a descriptive qualitative approach to deeply explore the process of technology based innovation management in strengthening the culture of science and *da'wah* at Pondok Pesantren Al-Aqobah Jombang. The qualitative approach was chosen because it can provide a comprehensive description of the context, dynamics, and meanings behind the implementation of innovation management within the pesantren environment (Charli et al., 2022). Through this approach, the researcher seeks to gain a thorough understanding of how technology is applied as a means to improve the quality of learning, expand the scope of *da'wah*, and foster a scientific spirit among the students and administrators of the pesantren. Thus, this study not only describes the on going innovation practices but also highlights the supporting factors and challenges encountered in the effort to integrate Islamic values with modern technological developments.

The data collection techniques used include participant observation, in-depth interviews, and documentation (Creswell, 2003). Participant observation was conducted by actively involving the researcher in various pesantren activities, such as the learning process, digital based administrative practices, and the implementation of online *da'wah* programs. Through this observation, the researcher was able to capture direct interactions among actors, technological tools, and the everyday pesantren culture.

In depth interviews were conducted with pesantren leaders, *ustadz/ustadzah* (teachers), technology management staff, and students (*santri*) involved in the innovation programs. The interviews were designed to be open ended, allowing informants to freely express their experiences, challenges, and expectations regarding the integration of technology and *da'wah* in the pesantren. In addition, documentation was carried out by collecting archives, activity photos, and administrative documents that support the field findings (Assyakurrohim et al., 2022).

The validity of the data in this study was maintained through several techniques. The researcher applied source and method triangulation to ensure consistency of information from various parties and the validity of data across different techniques (Fadli, 2021). *Member checking* was also conducted by reconfirming the data and the interpretation of interview results with key informants, thereby minimizing the potential for researcher perception bias. All data recording and reporting processes were carried out transparently and responsibly.

Data analysis was conducted based on the interactive model updated by Miles, Huberman, and Saldana (2014) (Pahkeviannur, 2022). The analysis stages included: first, systematic data collection from various field sources; second, data condensation the process of selecting, summarizing, and focusing the collected data to obtain the core of relevant information; third, data presentation through matrices, tables, or narratives to make relationships among data more visible; and

fourth, drawing and verifying conclusions, where the researcher interprets the findings comprehensively to generate deep and testable understanding (Patel, 2016). The application of the latest Miles, Huberman & Saldana data analysis model is expected to produce valid, sharp, and comprehensive interpretations while portraying the dynamics of technology based Islamic education innovation management in a holistic and meaningful way within the contemporary pesantren context.

## Results

### *The Knowledge Stage*

In the context of Pondok Pesantren Al-Aqobah Jombang, understanding technology-based Islamic education innovation has become one of the main focuses in strengthening the quality of learning and the effectiveness of *da'wah*. Based on participant observations and in depth interviews, it was found that the level of knowledge among pesantren stakeholders regarding technological innovation varies according to their respective characteristics and roles.

At the leadership level, awareness of the importance of digital innovation is very strong. The pesantren leaders understand digital transformation as a strategic necessity in building competitiveness and ensuring the sustainability of Islamic education in the modern era. They actively facilitate various training programs, socialization efforts, and policy formulations that prioritize the integration of technology into science learning and *da'wah* programs. This awareness aligns with the initial "knowledge" stage of Rogers' (2013) innovation diffusion theory, in which innovators serve as the main drivers introducing and expanding understanding of the benefits of technology to the pesantren community.

Teachers and *ustadz* show varying levels of knowledge. Most are theoretically familiar with the concepts of digital learning and the importance of digital media in strengthening the transfer of scientific knowledge and Islamic values. However, a gap was identified in technical competence, particularly among senior teachers who are not yet fully accustomed to using digital devices and modern learning applications. To address this, the pesantren actively conducts internal mentoring and training so that all educators gain practical knowledge and readiness to integrate technology into the curriculum. This internal dissemination of knowledge is crucial in ensuring that every member of the pesantren community experiences initial exposure to innovation, which Rogers describes as a fundamental stage before the development of innovative attitudes and behaviors.

Students (*santri*), as the youngest group, generally show a higher level of adaptation to technological advancements. Today's *santri* generation is already familiar with social media, online learning applications, and various digital platforms developed by the pesantren to support learning and *da'wah* activities. They not only master the basic knowledge of technology use but also understand its function as an effective medium for *da'wah*. The integration of technology has encouraged *santri* to actively create educational science content and spread

Islamic messages through the pesantren's various digital channels, both internally and externally. This practical knowledge serves as an important foundation for building a pesantren culture that is responsive to contemporary developments and aligned with the principles of mass communication, where the use of digital media accelerates information dissemination and expands the reach of *da'wah*.

The study's findings also reveal a pattern of collective learning within Pondok Pesantren Al-Aqobah that strengthens the development of innovation knowledge. Dissemination of information about the benefits and methods of using technology is conducted continuously through various internal forums, such as seminars, workshops, and regular training sessions. Interpersonal communication remains key in building understanding and trust toward innovation within the pesantren community. This aligns with the principles of mass communication, which emphasize that messages delivered directly by authoritative figures can enhance credibility and accelerate the diffusion of innovation.

Furthermore, the process of accumulating knowledge about technological innovation in Islamic education within pesantren occurs gradually, beginning from the introduction stage to the facilitation of technology use in learning and *da'wah* practices. Over time, the pesantren environment has experienced a digital cultural shift that positions technology as an essential element in the lives of santri and the entire pesantren community. This increase in knowledge serves as the foundational stage for entering the next phases of innovation diffusion persuasion, decision, implementation, and confirmation as described by Rogers.

The key to successfully building an innovation knowledge base in the pesantren lies in the involvement of all parties, openness to change, and willingness to continuously learn. A combination of personal communication channels (face to face) and mass media channels (digital) serves as an effective strategy to ensure that all elements of the pesantren understand and accept technology-based Islamic educational innovations. Thus, Pondok Pesantren Al-Aqobah has demonstrated a systematic and structured development process of knowledge and digital literacy that aligns with contemporary theories of innovation diffusion and mass communication. With the strengthening of knowledge at all levels, technology-based educational innovation can be sustained and contribute significantly to enhancing science learning and developing an adaptive and relevant *da'wah* culture in the digital era.

### ***The Persuasion Stage***

The study found that the attitudes and acceptance of the leaders, teachers, ustadz, and santri of Pondok Pesantren Al-Aqobah Jombang toward digital innovation in Islamic education were characterized by openness, enthusiasm, and constructive caution at the persuasion stage. The persuasion process took place through various strategies, including intensive training sessions, inspirational discussions, and motivational efforts demonstrated directly by the pesantren leadership.

The pesantren leaders exemplified a strong commitment to digitalization by actively participating in technology training, formulating policies that support

online systems, and providing motivational communication emphasizing that digital innovation does not mean abandoning pesantren traditions. This positive attitude was reflected in the development of digitalized administrative systems, online halaqah (study circles), and the increasing production of da'wah content. The leadership consistently emphasized the importance of preserving the spiritual essence and adab (moral values) of the santri in every change that took place.

Teachers and *ustadz* showed adaptive attitudes, although at first there were doubts and challenges, especially among those unfamiliar with digital tools. Through repeated training, mentoring from younger teachers, and motivation from the leadership, they gradually developed confidence and willingness to experiment with various e-learning applications and social media platforms as tools for teaching and *da'wah*. Open dialogue also helped dispel concerns that digitalization might weaken their traditional role as educators. This growing acceptance and enthusiasm for learning encouraged teachers and *ustadz* to explore new methods of teaching and spreading Islamic messages digitally.

The santri are highly responsive to digital innovation. They directly experience the benefits of technology as a flexible learning tool and as a medium for da'wah expression. Their enthusiasm is strengthened through various training sessions and motivational programs that teach not only digital competencies but also the importance of ethics, responsibility, and Islamic adab in the digital sphere. The santri feel supported and motivated when their work is published on the pesantren's official digital channels and receives appreciation from teachers and leaders, creating a healthy and inspiring atmosphere of competition.

The persuasion process is also characterized by the combined use of mass and interpersonal communication approaches. The extensive use of digital media for socialization, motivation, and training serves as a primary strategy to strengthen trust and positive attitudes toward innovation. Authoritative figures such as pesantren leaders and senior *ustadz* act as motivators of change, enhancing the community's mental readiness to accept and implement digital transformation.

Different previous studies in several traditional pesantren that tended to be skeptical toward technology, Pondok Pesantren Al-Aqobah demonstrates success in fostering an adaptive, open, and collaborative attitude. This enthusiasm and positive mindset form a strong foundation for moving toward the next stages decision, implementation, and confirmation ensuring the sustainable development of digital innovation within the pesantren environment.

### ***The Decision Stage***

The decision making process for implementing technology based innovations has been carried out systematically and participatively within the pesantren environment at the *decision* stage. The pesantren leadership, together with teachers (*ustadz*) and administrative staff, actively formulate digitalization strategies that accommodate the needs of education, administration, and *da'wah*.

Decisions to integrate technology into the pesantren's learning programs and management systems are made through *musyawarah* (deliberation) involving various elements from administrators to *santri* representatives. The

strategic steps established include the use of online learning platforms, digitalization of administrative systems, conducting *halaqah* and *kitab* studies online, and implementing cashless transaction systems within the pesantren. This demonstrates that the pesantren is not merely following modernization trends, but rather designing policies that harmonize digitalization with the preservation of traditional values.

The pesantren leadership emphasizes the importance of maintaining classical values, *adab* (proper conduct), and spirituality in every policy decision. Innovation-related decisions are always made with careful consideration of real conditions, human resource readiness, and the availability of technological infrastructure. The decision-making process is also accompanied by routine evaluations to ensure that the implemented policies have a positive impact on strengthening science learning, improving administrative management, and enhancing the effectiveness of digital *da'wah*.

The digitalization programs that have been decided upon are realized through the use of educational applications, the development of official social media channels for *da'wah*, and intensive training for teachers, staff, and *santri*, ensuring that all policies are implemented in an integrated and sustainable manner. These findings affirm that the decision-making process at Pondok Pesantren Al-Aqobah is not merely top-down but involves collective participation to achieve the vision of a modern pesantren that continues to preserve the spirit of *salaf* traditions.

### ***The Implementation Stage***

The study's findings show that the implementation of technology-based innovation at Pondok Pesantren Al-Aqobah Jombang has been carried out comprehensively and integrated into various aspects of pesantren life. The digitalization programs are applied across learning systems, administration, and *da'wah* activities. In the field of learning, the use of online platforms allows *santri* to access materials such as *kitab kuning*, general subjects, and lecture notes through digital devices. The teaching and learning process is also supported by video conferencing technology, enabling *pengajian* and *halaqah* sessions to be attended by *santri* from different locations, both at the main campus and its branches. Moreover, digitalization supports a more personalized and flexible learning approach while preserving traditional pesantren methods such as *sorogan*, *bandongan*, and *halaqah*.

Pesantren processes have been digitized, including *santri* data management, attendance, activity scheduling, financial reporting, and cashless payment systems in administration. *Santri*, their parents, and pesantren administrators benefit from improved convenience, efficiency, and transparency in financial transactions and other administrative activities. For *da'wah* activities, the pesantren utilizes social media and digital platforms to disseminate Islamic content and pesantren values. *Santri* are actively involved in producing creative *da'wah* content from ideation to execution allowing them to develop digital skills while taking responsibility for conveying Islamic messages to the wider community. Regular digital training programs for *santri*, such as Islamic content

creation, social media management, and the online publication of *kitab kuning*, have been consistently implemented.

The implementation of technological innovation also runs in harmony with the preservation of pesantren traditions, such as congregational prayers, collective *dzikir*, the practice of *musyawarah* (deliberation), and the cultivation of *santri* ethics. The use of digital devices is closely monitored by the *asatidz* to ensure alignment between technology utilization and pesantren values. Overall, the implementation stage has been effective and has had a positive impact on improving the quality of learning, enhancing management efficiency, and expanding the reach of the pesantren's *da'wah* all while maintaining the heritage of *santri* traditions.

### **The Confirmation Stage**

The study's findings indicate that Pondok Pesantren Al-Aqobah Jombang actively conducts continuous evaluations to ensure that technology-based innovations truly bring positive impacts on the quality of science learning and the strengthening of *da'wah* culture. Evaluations are routinely carried out by the leadership, teachers, and pesantren administrators to monitor the effectiveness of online learning platforms, digital administrative applications, and cashless programs.

The pesantren's leaders and administrators consistently provide updates and reinforcement of digitalization policies, whether related to learning systems, administrative governance, or digital *da'wah* mechanisms. Advanced training programs and evaluation studies are implemented regularly to update the digital skills of educators and *santri*, while also adjusting innovation strategies to current needs in the field.

The *santri* are further motivated through recognition of their digital works, publication of creative *da'wah* content, and monitoring of ethical technology use. Evaluation results are used as a basis for program improvement from developing new learning media and refining digital administrative systems to expanding the pesantren's online *da'wah* networks. The sustainability of technological innovation is also supported through cross-branch collaboration among pesantren units, ensuring that all learning divisions can implement the same best practices and directly experience the benefits of innovation. With strengthened evaluation management and ongoing adjustments, all aspects of science learning and digital *da'wah* within the pesantren continue to develop, enabling them to effectively respond to contemporary challenges without neglecting the spiritual essence and traditions of the pesantren.

### **Discussion**

The findings of this study demonstrate the success of Pondok Pesantren Al-Aqobah Jombang in harmoniously integrating digital innovation with the preservation of traditional Islamic boarding school (pesantren) values. Based on the analysis of each stage of Rogers' (2013) diffusion of innovation theory (Rahmawati et al., 2023), the pesantren has shown an adaptive and responsive

attitude toward the challenges of the digital era without compromising Islamic values and scholarly traditions that define its identity .

At the knowledge stage, the active involvement of leaders, teachers, and students in the socialization of technological innovation became a strong foundation for the successful implementation of digitalization programs. The dissemination of knowledge was carried out collectively and hierarchically through a combination of interpersonal and mass communication (Rosyidi, 2021), effectively building the digital literacy and confidence of the pesantren community. The participation of various stakeholders in this initial phase also encouraged the emergence of an adaptive, progressive, and collaborative learning culture toward technological developments.

Meanwhile, the persuasion stage was characterized by openness, enthusiasm, and constructive caution in accepting digital innovation. This positive attitude was cultivated through continuous training, direct examples set by leaders, and motivational mechanisms such as appreciation for students' digital works. Interpersonal and mass communication approaches worked hand in hand, with digital media being used effectively as a means of motivation and attitude formation, thereby accelerating the persuasion process. These findings reinforce mass communication theory within the Islamic perspective, emphasizing the importance of delivering messages that are truthful (*qaulan sadidan*), gentle (*qaulan layyinan*), and instructive (*qaulan ma'rufan*) in every process of social transformation.

The decision making process at *Pondok Pesantren Al-Aqobah* operates through a participatory and consultative (*musyawarah*) approach. Strategic decisions to adopt technology are made by carefully considering human resource readiness, infrastructure capacity, and the preservation of pesantren traditions. Administrators, teachers, and students are actively involved in discussions, ensuring that digitalization policies are not merely top down but are supported by collective participation. The resulting decisions include the integration of technology into online learning, digital administration, cashless payment systems, and regular digital training programs within the pesantren.

Technological innovation is accompanied by close supervision and the preservation of traditional *adab* (Islamic etiquette) at the implementation stage (Gumilang & Nurcholis, 2018) . Digitalization is applied through hybrid learning methods (combining in-person and online sessions), application based administrative management, and the production of digital *da'wah* content by students. The effectiveness of implementation is evident in improved learning accessibility, management efficiency, and the expanded reach of the pesantren's *da'wah*. Nevertheless, the adoption of technology remains balanced with the preservation of traditional learning systems such as *sorogan*, *bandongan*, and *halaqah*, as well as Islamic spiritual and ethical values (Hafidh et al., 2023).

The confirmation stage reinforces the sustainability of digitalization strategies through regular evaluations, advanced training programs, and recognition for students' digital achievements (Abd. Aziz & Muhamad Aso Samsudin, 2020). These evaluations aim to refine ongoing systems, align innovations with learning and *da'wah* needs, and ensure that all digitalization initiatives remain consistent with traditional Islamic values. Structured

evaluation practices have resulted in improved quality of science learning, administrative governance, and the expansion of digital *da'wah* initiatives.

The discussion of this research contributes to the development of transformative pesantren management studies, particularly in the era of digital disruption (Damanhuri et al., 2013). The findings align with Rogers' innovation diffusion model, which emphasizes the importance of knowledge, persuasion, decision, implementation, and confirmation in social change processes. The success factors behind innovation at *Pondok Pesantren Al-Aqobah* include visionary leadership, active participation from all pesantren elements, and a strong synergy between technology and tradition. Challenges such as limited infrastructure and disparities in digital literacy are addressed through regular training and intergenerational collaboration. Thus, the digitalization strategy implemented by *Pondok Pesantren Al-Aqobah* can serve as an inspiration for other Islamic educational institutions. The modern approach, firmly grounded in local traditions, demonstrates that innovation and the preservation of values can coexist, resulting in an inclusive, progressive, and contextually relevant educational environment.

## Conclusion

Based on the research findings and discussion, it can be concluded that the process of digital innovation diffusion at *Pondok Pesantren Al-Aqobah Jombang* has been carried out systematically starting from knowledge dissemination, the formation of positive attitudes, participatory decision making, implementation of digitalization programs, to continuous evaluation and reinforcement. The integration of technology into learning, administration, and *da'wah* has not only improved efficiency and educational accessibility but also fostered a pesantren culture that is adaptive to modern developments while maintaining traditional values. This success is supported by visionary leadership, active participation from all pesantren stakeholders, ongoing training, and a balanced approach between technological utilization and the preservation of *santri* traditions. Consequently, digital innovation at Al-Aqobah stands as a model of progressive and sustainable Islamic educational transformation in the digital era.

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