

Transformation of Educational Technology: Impact on Pesantren Education (Case Study at Bustanul Ulum 03 Jember Islamic Boarding School)

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ARTICLE INFO

Keywords:

Transformation; Education
Technology; Pesantren
Education

Article history:

Received 2025-01-01

Revised 2025-02-15

Accepted 2025-04-30

ABSTRACT

Technological transformation has become a key factor in enhancing the quality of education, including within Islamic boarding schools (pesantren). This study aims to analyze the impact of technology implementation in the educational system at Bustanul Ulum Islamic Boarding School. The institution has adopted two digital applications: SAQu for administrative management and BUQu for digital-based learning. The integration of technology within the pesantren provides various benefits, such as improved access to educational resources, increased interactivity in the learning process, greater flexibility in teaching methods, and enhanced overall teaching and learning quality. Despite these advantages, several challenges arise, including limited digital literacy among human resources and the availability of adequate technological infrastructure. To address these issues, the pesantren has implemented a range of strategies, including awareness programs, human resource development training, and student-involved digital-based business innovations. This research employs a qualitative method aimed at deeply understanding the phenomenon and generating descriptive data through interviews and observations. The findings indicate that technological integration in the pesantren not only improves the effectiveness of learning but also creates opportunities for students to develop digital and entrepreneurial skills. Therefore, technological transformation in Islamic boarding schools is expected to continue evolving in order to strengthen the competitiveness of Islamic education in the digital era.

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INTRODUCTION

Technological developments in the 21st century have affected the world in various aspects, especially in the economy and culture. Countries are competing to develop strategic technologies, resulting in increasingly fierce economic competition. The ease of access to information and the development of information technology have eliminated distance and time barriers, allowing countries, including developing countries such as Indonesia, to more easily access business, industrial and technological information.

With the rapid advancement of technology since the 1980s, our views on distance, time and lifestyle have changed dramatically. In the Era of globalisation, interaction between nations has increased, giving people access to cultural values from abroad. Indonesia's economy, like many other countries is increasingly integrated with the global economy, making life increasingly competitive.

Despite its vast natural resource potential, Indonesia still faces challenges in terms of competitive human resources. The economic crisis that has hit Asia and Europe is one of the impacts of globalisation.

In facing a new era based on information and technology, Indonesia has endeavoured to transform various sectors, including technology. This transformation goes hand in hand with the reform process, as an effort to correct past mistakes and prepare for a better future. However, this major change must be managed wisely so as not to damage the nation's values. In this case, religion has an important role in maintaining the nation's cultural values and identity. (Mahmud, 2002)

Technological transformation has become an undeniable phenomenon in many areas of life, including education. Around the world, the education sector faces new challenges and new opportunities to improve the quality of education and learning as a result of the rapid growth of information and communication technology. Pesantren as an Islamic educational institution that has existed since the 10th century, plays an important role in shaping the character and knowledge of the nation's next generation in Indonesia. Although pesantren are known for their traditional education methods, which prioritise hands-on learning and the teaching of Islam through the yellowclass books, the rapid advancement of technology affects various aspects of life, including the pesantren education system. Therefore, the discussion of the use of technology in pesantren education, referred to as 'technological transformation,' becomes very important.

One of the principles of Pesantren today is:

المحافظة على القديم الصالح و الأخذ بالجديد الأصح

Meaning: 'Keeping the old traditions and taking something new and good'

This concept teaches to maintain and value traditions that have proven to be good and effective while remaining open to favourable innovations and advancements. This principle combines two main components in pesantren education. The first is to maintain the classical religious knowledge and teaching methods passed down by the salaf scholars (such as the classical yellowclassical books), and the second is to benefit from the progress of the times, such as relevant digital updates.

Islamic boarding schools, as Islamic educational institutions, have distinctive characteristics. One of them is their education system that is based on religious traditions and strong socio-cultural principles. Nonetheless, pesantren face a great challenge to transform and adapt technology in their educational processes amidst globalisation and digitalisation that are changing almost all aspects of human life. Therefore, technological transformation in the world of pesantren is not only a demand but also an opportunity that must be utilised to improve the quality of pesantren education in order to compete with other educational institutions that are more advanced in utilising technology.

Islamic boarding schools in Indonesia are increasingly showing interest and efforts in integrating digital technology into their learning systems. This integration is a response to the demands of the times in the era of globalisation and digitalisation, as well as an effort to improve the quality of education and competitiveness of pesantren graduates. Technology offers a variety of more interactive and engaging learning resources, which can improve students' understanding of the subject matter (Aziz, 2016).

This research focuses on analysing the quality of Islamic boarding school education through the application of technology. Islamic boarding schools have been known for their more conventional approach to Islamic education, where teaching is conducted face-to-face with the halaqah method and yellowclassical book studies. However, with the development of technology and the digital world, various innovations in the form of applications, online digital platforms, and technology-based learning have been introduced in pesantren education. However, not all pesantren have the same readiness in facing these changes, both in terms of infrastructure, teaching skills, and the level of digital literacy among students.

In response to these developments, technological transformation in Islamic boarding schools is expected to contribute significantly to improving the quality of education. Technology adoption is not only limited to the use of digital devices and applications in learning, but also includes the

development of technology-based curricula, the enhancement of digital skills for teachers and students, and the creation of more open and accessible learning spaces. In this way, technology has the potential to enhance teaching materials, providing wider access to educational resources. Technology provides unlimited access to various sources of information and learning materials. Santris can easily access scientific journals, electronic books, learning videos, and other educational resources relevant to the pesantren curriculum (Hefner et al., 2007).

Although the use of technology in pesantren can have many benefits, there are many challenges faced during the transformation process. Many pesantren, especially in remote areas, face technological infrastructure limitations such as limited internet access and inadequate availability of technological devices. In addition, a major obstacle in the utilisation of technology is the low digital literacy among students and educators. To ensure a successful technological transformation, a comprehensive approach is needed that includes training and capacity building for teachers, adequate infrastructure, and digital skills enhancement for students.

It is important to remember that the quality of education is not only academic results or academic expertise, but the quality of education also includes character development, social skills, and the ability of santri to adapt to changing times. Therefore, this research will assess how effective technology can help students learn, which includes character development, morals and other life skills needed by santri to face global challenges.

Pesantren have a strategic role in producing a generation that not only understands religious teachings but is also ready to face the times with relevant skills. Therefore, the use of technology in pesantren education has the potential to create significant changes in the quality of education in pesantren in Indonesia, the country with the largest Muslim population in the world. Pesantren ideally offer a holistic education that combines a deep understanding of Islamic religious teachings with relevant worldly skills. This means santri not only study fiqh, tafsir, and other Islamic sciences, but also maths, science, foreign languages, and information technology (Ess & Elzaatari, 2016).

It is hoped that this research will increase understanding of the importance of using technology in pesantren education and offer suggestions to help pesantren and related parties accelerate digital transformation to improve the quality of education. With this research, it is hoped that pesantren in Indonesia will see technology as a tool that can strengthen and enrich existing educational methods without compromising the religious and traditional values that characterise pesantren.

Overall, incorporating technology into pesantren education is an important step towards improving the quality of education in these Islamic educational institutions. This change requires support from the government, pesantren managers, and the general public. This research is expected to help pesantren and education stakeholders make the right policies and strategies to incorporate technology into the pesantren education system.

One of the main components of human resource development (HRD) is education, which plays an important role in the social, economic and cultural growth of a country. Education has strategic value for Indonesia as it is an important part of the effort to produce a generation that is intelligent, competitive, noble, and able to face future challenges. In this context, there are many different models of education in Indonesia that are interesting to note, one of which is the Islamic boarding school. Islamic boarding schools have been around for a long time and are an important pillar in the implementation of Islamic education in Indonesia. Their role in shaping the character and personality of Muslims cannot be ignored. Islamic boarding schools are also increasingly showing progress in adjusting to the times (Azizah, 2020).

Islamic boarding schools face challenges to innovate in their education management in line with changing times and demands for better quality education. The quality of education produced by boarding schools is one of the main indicators that show how effective the institution is in achieving educational goals, both in terms of knowledge and skills. Educational innovation becomes very relevant because it is able to provide answers to various problems faced by this educational institution.

Islamic boarding schools can produce graduates who not only excel in the field of religion, but also have relevant abilities and skills. This educational innovation not only includes teaching methods that are more contemporary and in accordance with the needs of the times, but also includes aspects of human resource management, infrastructure, curriculum, and educational approaches based on Islamic values. Therefore, analysing the quality of boarding school education becomes very important to find out the extent to which the innovations made succeed in improving the quality of education and its relevance to the times.

Conversely, although education in Islamic boarding schools has experienced significant progress, there are still several challenges that must be overcome to improve the quality of education. Some of these challenges include limited resources in terms of qualified teaching staff, the availability of adequate facilities and infrastructure, and a curriculum that is not in accordance with the needs of the community and the world of work. Therefore, efforts to improve the quality of education in Islamic boarding schools must always be made to keep up with the times including following the development of the digital revolution 5.0.

In such a situation, it is imperative to conduct a thorough analysis of the educational innovations used in boarding schools and assess the extent to which they contribute to improving the quality of education. The purpose of this study is to discover the various innovations made in boarding school education and analyse the resulting quality of education. Therefore, this analysis will not only provide an overview of the existing strengths and weaknesses, but will also provide recommendations for further improvement and development (Hidayat et al., 2019).

In the midst of the current development of globalisation, educational innovation in Islamic boarding schools must also be considered. All aspects of human life are affected by globalisation, including education. Educational institutions, including boarding schools, must be able to adjust to the demands of an increasingly competitive labour market and advances in technology and science. Therefore, Islamic boarding schools must not only be able to maintain the Islamic scientific tradition but also be able to provide education in accordance with the times, while maintaining the basic values of Islamic education.

Pesantren as traditional Islamic educational institutions are now required to innovate in order to adapt to the dynamics of globalisation, especially in the midst of an increasingly competitive job market and advances in technology and science. The innovation not only includes curriculum updates that integrate religious knowledge with general knowledge and vocational skills, but also involves mastering digital technology, improving foreign language skills, and developing institutional management. This is necessary so that santri not only become masters of the Islamic tradition, but are also ready to compete in the modern world of work with digital platforms and so on.

METHODS

This research uses qualitative methods that aim to understand phenomena in a deeper context and produce data in the form of words sourced from oral or written from interviews and observations. The research will examine how technology can play a role in the quality of education at Bustanul Ulum Jember Islamic Boarding School. In this study, data were collected through interviews, observation and documentation. Interviews were conducted with pesantren teachers, pesantren IT team and students. Direct observation of technology users in pesantren activities. Research that focuses on describing phenomena in depth through rich data collection and careful analysis to provide a better understanding of the context under study. This research places more emphasis on the process of describing, understanding, and interpreting existing phenomena, rather than the purpose of seeking generalisations or proving hypotheses Lexy J. Moeleong (Moeleong, 2007).

Qualitative research with a descriptive approach as a process that aims to describe, understand, and interpret social phenomena in a broader and deeper context. Berg emphasises that

descriptive qualitative research focuses on unstructured data collection and tends to lead to a more holistic understanding of the subject under study (Berg, 2001).

Qualitative research aims to understand social phenomena in depth, from the perspective of participants. Therefore, the data collection techniques used are flexible, open, and allow researchers to explore information in depth. In-depth interview is a data collection technique by conducting face-to-face conversations between researchers and informants. This interview is open and unstructured, allowing informants to convey their views, experiences and thoughts freely. Interviews aim to explore in-depth information about the experiences, perspectives, and meanings given by informants to a phenomenon (Seidman, 2013).

FINDINGS AND DISCUSSION

The technological transformation that has taken place since 2016 is characterised by the emergence of the digital economy, big data, Internet of Things (IoT), robotics, and cloud systems. These technologies have changed the way we interact, work, and live our daily lives. First introduced in Japan on 21 January 2019, the concept of Society 5.0 is a response to the Industrial Revolution 4.0. Society 5.0 describes a society that integrates advanced technologies such as artificial intelligence (AI) and IoT into daily life to improve the quality of human life. People are required to interact with new technologies and integrate them into their lives (Wibowo, 2016).

In the era of digital revolution 5.0 as it is now, technology plays an important role in various aspects of life, including in the world of education and administrative management. Pondok Pesantren Bustanul Ulum Jember, as an Islamic educational institution that focuses on teaching religious knowledge, general knowledge and life skills, has utilised technology to improve the quality of services and educational processes. Pondok Pesantren Bustanul Ulum Jember uses a digital platform by having two digital applications to improve administrative management and enhance the educational process in the pesantren environment, namely SAQu and BUQu. These two applications have a very important role in managing various aspects of pesantren life, as well as providing a more modern and efficient learning experience.

Aspects	SAQu (Boarding School Administration System)	BUQu (Bustanul Ulum Digital Learning)
Main Functions	Administrative management of pesantren	Digital learning platform for santri
Purpose	Simplify the management of pesantren administration	Improving the quality of learning
Primary User	Pesantren managers, walisantri, and santri	Students and teachers
Key Features	<ul style="list-style-type: none"> - Digital student registration - Financial & learning management - Student attendance & monitoring - Real-time & automated financial reports 	<ul style="list-style-type: none"> - E-Learning online learning materials - E-Library: Digital library with books - E-Business: Digital-based business training
Access & Technology	Digital-based application with SAQu cards for students and application access for student guardians	Digital-based application with santri account to access learning materials and features
Impact on Pesantren	Simplify administrative management, improve transparency, and efficiency of pesantren management	Enriching students' learning experiences, improving digital literacy, and equipping students with 21st century skills

Table: Differences between SAQu app and BUQu app

1. SAQu (Boarding School Administration System)

Pesantren as Islamic educational institutions have a complex administrative system, including the management of santri data, finances, curriculum, and academic and non-academic activities. In the digital era, many pesantren have begun to adopt technology-based administrative management systems to improve efficiency and effectiveness in their management. The SAQu application is used for administrative management at Bustanul Ulum Islamic Boarding School. The digitalisation of pesantren administration aims to: facilitate access to information, improve transparency and accountability, improve work efficiency, facilitate communication with walisantri (Mulyono, 2020). SAQu application helps manage administrative data digitally, making it easier to manage various administrative aspects such as:

- a. Student registration: Facilitate the registration process and data management of new students. With SAQu, the student registration process becomes more practical. The pesantren manager can enter new student data digitally, facilitate the verification process, and reduce the possibility of lost or duplicated data.
- b. Financial Management: Manage the payment of pesantren fees, ranging from tuition fees, monthly fees, to daily snacks for students while in the pesantren. All transactions are recorded automatically, making it easier to generate periodic financial reports and ensure pesantren financial transparency.
- c. Financial Report: Make it easy to generate financial reports automatically and more transparently.
- d. Student allowance (pocket money): Walisantri has access to mutations (children's spending), provides a daily pocket limit so that santri pocket money is more controllable. This also minimises the loss of santri money in the pesantren.

The use of SAQu makes the management of pesantren administration more structured, efficient, and easily accessible by pesantren caregivers, walisantri and santri. SAQu uses two accesses, namely a digital application held by walisantri to monitor their children in the pesantren and SAQu cards used by santri for their daily activities. In the SAQu application, there are also additional features about the development of santri and santri activities in the pesantren that can be monitored by walisantri at home, namely:

- a. Tahfidz (memorisation) feature. Teachers can directly provide confirmation notes on memorisation achievements to students where these tahfidz notes are directly connected to the application held by parents so that walisantri can find out the progress of their children's memorisation directly through their cellphones at home.
- b. Grade Features. The value feature or academic report card where the student's learning results can be reported to the walisantri through the application, so that in real time parents can find out the results of the student's learning through their cellphones at home.
- c. Presence feature. Recording the presence of students in pesantren activities. SAQu is equipped with an attendance system that allows pesantren managers and walisantri to monitor the presence of students in every pesantren activity, whether it is learning activities, congregational prayers, or other extracurricular activities.

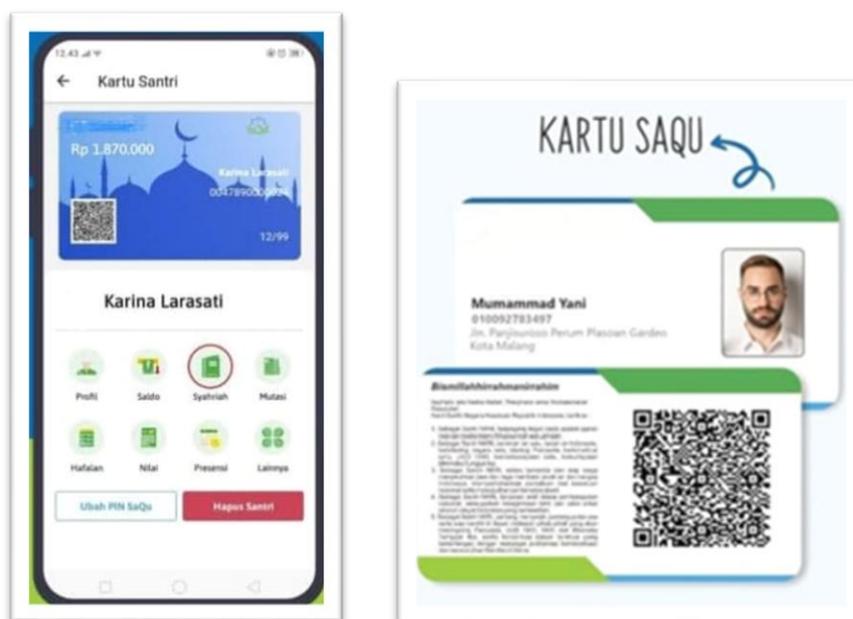


Image: SAQu app and SAQu card

2. BUQu (Bustanul Ulum Digital Learning)

The app is designed to support education and the development of digital learning materials. The application allows educators and students to access, create, and share teaching materials in digital format, so that the learning process becomes more interactive and flexible. The presence of digital platform applications makes it easier for educators and students to access various digital teaching materials anytime and anywhere. This is in line with the purpose of digital-based teaching materials that allow students to learn independently and efficiently. (Suartama, 2020).

BUQu application focuses on the educational aspect and the development of digital learning materials. BUQu offers various features that enrich the learning experience for students at Pondok Pesantren Bustanul Ulum, including:

- a. E-Learning: Provides online learning materials that can be accessed by students at any time. This allows students to learn more flexibly and can access various materials from different sources.
- b. E-Library: Provides a digital library with a collection of books and books related to religious science, general knowledge, and various other references that support learning. E-learning enables a flexible and interactive learning process, while the e-library provides easy access to a variety of digital reading resources that support teaching and learning activities. The integration of these digital technologies helps pesantren to manage information efficiently and expand the reach of literacy for students (Nafisah, 2020).
- c. E-Business: Contains innovations and learning related to the business world, especially regarding the Muslim fashion brand developed by the pesantren under the name 'NingQu'. This application facilitates santri to learn about how to manage a fashion business, from product creation to marketing. The integration of technology equips santri with digital skills that are essential to face the world of work in the 21st century. These skills include the ability to use software, search for information on the internet, communicate online, create digital content, design according to creation, and others (Munir, 2018).
- d. NingQu' Fashion Show: This app also provides a platform to showcase the work of the fashion brand 'NingQu', including fashion shows that can be studied and used as a reference by students to develop skills in fashion design.
- e. Make-up Learning: Teaching make-up skills to santri, which is part of the life skills development implemented in the pesantren.

- f. Use of IT and Graphic Design: The BUQu application also presents learning materials on the use of information technology, as well as the basics of graphic design, which are important skills in today's digital era.

With BUQu, Bustanul Ulum Jember Islamic Boarding School can provide broader education, covering various aspects of practical skills needed by students to face an increasingly digital and competitive world.

Overall, these two applications (SAQu for administrative management and BUQu for education) function to improve the quality of Islamic boarding school management and enrich the educational experience of students by utilizing digital technology.

Application of Technology at Bustanul Ulum Islamic Boarding School

The application of technology in pesantren in the Society 5.0 era is not just following the trend, but is a strategic step to ensure that pesantren remain relevant to the times. By integrating technology in education and administration, pesantren can improve the quality of learning, expand access to knowledge, and equip students with skills needed in the digital era (Rahman & Husin, 2022). The implementation of technology in Islamic boarding schools is an important step in facing the digital revolution era of Society 5.0 and ensuring that Islamic boarding schools can remain relevant to the times, while maintaining the traditional values that characterize them. One of the boarding schools that integrates technology in its learning process is Bustanul Ulum Jember Islamic Boarding School. The application of this technology aims to enrich the learning experience of the students in both religious and general education learning materials.

Pondok Pesantren Bustanul Ulum Jember has integrated various technological tools in its learning process. The use of computers, the internet, and online learning applications have been implemented to enrich the learning experience of santri. This application is done in a way that supports religious learning materials as well as general education. The following is a more extensive explanation of the application of technology at Pondok Pesantren Bustanul Ulum Jember:

1. Use of Computers in Learning

Pondok Pesantren Bustanul Ulum Jember utilizes computers as a tool for the learning process. Computers are used not only for administrative activities such as data management of santri, but also to assist in learning religious and general materials. With computer devices, students can access various teaching materials, digital books, and various references that are relevant to exploring Islamic religious studies and general science.

The use of computers also allows students to practice technology skills, such as the use of software for typing, presentations, and others that are important in future professional life.

2. Internet Access for Online Learning

One of the significant applications of technology at Pondok Pesantren Bustanul Ulum is the use of the internet. Through internet access, students can access various online learning resources, including articles and videos that support their learning, which have gone through a qualification and classification process by the Pesantren media team and the Pesantren IT team. The internet also opens up opportunities for santri to reopen online classes (e-learning) that have been stored in each santri's Pesantren digital platform account, which allows them to learn from various educational resources outside the pesantren, including universities, educational institutions, and even prominent religious figures.

The internet also makes it easy for santri to communicate and discuss online, which increases the interaction between santri and the teaching they receive. Thus, the internet not only enriches santri's knowledge, but also facilitates the development of digital communication skills that are increasingly important in the modern world.

3. Online Learning Application

The implementation of online learning applications in pesantren has become an effective solution in improving the quality of education. By utilizing digital technology, pesantren can integrate traditional learning methods with online platforms, allowing students to access

learning materials anytime and anywhere. The implementation of online learning applications in pesantren shows the adaptation of traditional educational institutions to technological developments, ensuring continuity and quality of education for students in various situations. (Publication, 2024) The application of online learning applications is one of the ways applied by Pondok Pesantren Bustanul Ulum Jember to support the learning process. This application can be used for various purposes such as:

- a. Video, text, and audio-based delivery of learning materials.
- b. Online tests and quizzes to evaluate students' understanding of the material that has been taught.
- c. Online discussion forum that allows students to ask questions and discuss with teachers or fellow students.

This learning application not only covers Islamic religious materials, such as tafsir, fiqh, hadith, aqidah and others, but also general subjects such as math, languages, and other sciences. By using online learning applications, students can learn more flexibly, anytime and anywhere, which is certainly very helpful in creating a more dynamic learning atmosphere.

4. Integration of Religious Learning and General Education

One of the strengths of the application of technology at Pondok Pesantren Bustanul Ulum is the integration between religious learning and general education. Technology helps create a balance between in-depth religious teaching and applicable general knowledge. For example, santri not only learn religious knowledge through classical books, but can also utilize the internet to deepen religious studies with various perspectives and current sources.

On the other hand, general education taught in pesantren is also increasingly technology-based. Lessons such as math, science, and English, which may have been considered separate from the pesantren tradition, are now taught with more interactive and engaging methods through various technology-based learning applications.

Information Behavior of santri in the digital era includes how they search, evaluate, use, and distribute information (both religious and general) by utilizing digital technology. In the early stages, santri need to master digital literacy: the ability to navigate the internet, use pesantren applications (e.g. Al-Shamela digital library, Maktabah Syamilah), and utilize search engines to find Qur'anic texts, tafsir, and classical books. This literacy also includes the ability to assess the credibility of sources, for example distinguishing between official websites of religious institutions and unverified blogs or hoax content. With the provision of literacy, santri are able to access a wider treasure of knowledge without being trapped in misinformation.

After literacy is built, santri move to the empowerment stage (changing themselves from consumers of information to producers and agents of change). They begin to create digital da'wah content: video lectures on YouTube, blog posts on contemporary fiqh, or podcasts of yellow book discussions. In modern pesantren communities, many santri have pioneered Islamic edtech startups, developing online learning platforms or mobile applications to make it easier for santri to learn independently. Empowerment is also seen when santri collaborate across pesantren in virtual forums, building alumni networks that share scholarship and employment opportunities. Thus, santri information behavior not only supports religious and academic intelligence, but also encourages their active role in advancing society in the digital era (Mustas, 2021).

5. Digital Skills Enhancement for Santri

The development of digital technology has brought significant changes in various aspects of life, including the world of education and the world of work. In facing the digital era, santri as part of the younger generation must be equipped with relevant skills in order to compete and contribute optimally in society. One very important skill is the understanding and mastery of digital technology, such as programming, graphic design, content management, and the use of technology for other productive purposes.

Pesantren, as educational institutions that play a role in shaping the character and knowledge of santri, need to adapt technological developments by introducing digital skills in

their curriculum. By mastering programming, santri can develop applications and digital platforms that support various needs, including in the field of da'wah and business. Graphic design provides the ability for santri to produce attractive and professional visual content, while digital content management allows them to convey messages and information effectively in cyberspace. In addition, the utilization of technology for productivity, such as the use of office software and digital collaboration tools, will further enhance their readiness in the modern world of work.

Improving digital skills for santri not only aims to increase their competitiveness in the job market, but also opens up opportunities for entrepreneurship and contributing in various professional fields. With these skills, santri can take an active role in the creative industry, information technology, media, and digital-based business sectors. Therefore, the integration of technology in pesantren education is an urgent need so that santri are able to face the challenges and opportunities in this digital era (Hayah, 2020).

The application of technology in pesantren also aims to develop the digital skills of santri. In this digital era, technological skills are important to prepare students to face future challenges. At Pondok Pesantren Bustanul Ulum Jember, students are not only taught about religious knowledge and general education, but also equipped with digital skills that are useful in the world of work. They are taught about programming, graphic design, content management, as well as the use of technology for other productive purposes.

6. Teaching Quality Improvement

Digital technology has brought great changes in the world of education, including in the quality of teaching. The use of applications in the development of learning materials plays an important role in improving the quality of teaching, both in formal school settings and pesantren-based education. Educational apps allow teachers to deliver materials in a more interactive, engaging way, and according to the needs of learners. The use of applications in the development of learning materials not only improves the effectiveness and quality of teaching, but also helps santri and students to be better prepared to face the challenges of the modern world. With the integration of technology in the education system, both in schools and pesantren, it is expected that students can learn more flexibly, creatively, and innovatively in developing their potential. (Kemendikbud, 2019).

With technology, the teaching process becomes more engaging and effective. Teachers at Pondok Pesantren Bustanul Ulum Jember can now use multimedia presentations, learning videos, and other digital resources to explain more complex concepts in a way that is easier to understand. This helps students to understand the material better and provides variety in teaching methods, which in turn improves the quality of education at the pesantren.

7. Improved accessibility of education

Technology has brought significant changes in the world of education, including in the pesantren environment. The application of technology in the pesantren learning system aims to increase the accessibility of education for students, both in terms of access to learning resources, flexibility in learning methods, and effectiveness of material delivery. The application of technology also contributes to increasing the accessibility of education for students who live in remote areas. With technology, students can learn from anywhere, without being limited by physical classrooms. This is very beneficial for those who cannot access education outside the pesantren due to location or cost constraints.

The digitalization of pesantren for digital registration, payment, and assessment has opened up learning opportunities without geographical and time barriers. Santris can attend virtual classes, discuss in online forums, and access additional materials at any time, supporting a flexible asynchronous learning model. Thus, technology not only expands the reach of Islamic education, but also empowers santri to learn independently, hone digital skills, and be ready to compete in the modern era (Yanto et al., 2023).

The Impact of Technology on the Quality of Education at Bustanul Ulum Islamic Boarding School

Education is one of the key factors in shaping the future of a nation. In the rapidly growing era of globalization, the adoption of technology in education has become inevitable. In this context, Islamic boarding schools as educational institutions that have a vital role in shaping the character and religious knowledge of the Indonesian people, now also face great challenges to adapt to technological developments. Bustanul Ulum Jember Islamic Boarding School, as one of the boarding schools that has a vision and mission to improve the quality of education, has adopted technology in its learning activities.

Before discussing the impact of technology on the quality of education, it is necessary to first understand how technological developments can affect the world of education. Information and communication technology (ICT) has revolutionized various aspects of life, including the education sector. The adoption of technology in education serves to improve the quality of learning, increase access to information, and facilitate more engaging and effective teaching methods.

Technology in education includes various tools and platforms that can be used in learning, such as computers, the internet, mobile devices, and digital learning applications. With technology, learning can be done not only in the classroom, but also outside the classroom using various online platforms that can be accessed anytime and anywhere. Technology also enables learning that is more based on individual needs and interests, which in turn can improve student motivation and learning outcomes (Sutopo, 2023).

Pondok Pesantren Bustanul Ulum Jember is one of the progressive pesantren in adopting technology in the education process. Along with the rapid advancement of technology, this boarding school began to see the importance of technology in improving the quality of education for students. As an educational institution that teaches both religious and general knowledge, this boarding school utilizes technology to develop more effective and efficient teaching methods.

One of the ways that Pondok Pesantren Bustanul Ulum adopts technology is by providing internet access for students. Internet access allows students to access various digital learning resources, such as e-books, journals, learning videos, and others. In addition, technology is also used to facilitate communication between teachers and students through an online learning platform.

In this article, we will discuss in depth the impact of technology on the quality of education in Pondok Pesantren Bustanul Ulum Jember. This impact can be seen from various perspectives, ranging from increasing access to learning resources, interactivity in the teaching process, to flexibility in the implementation of education that can improve the understanding of the material by students. In addition, technology also provides opportunities to introduce more innovative and creative learning methods in the context of pesantren. The following is a broader discussion of the impact of technology on the quality of education at Pondok Pesantren Bustanul Ulum:

1. Increasing students' access to learning resources

One of the most significant impacts of technology adoption at Pondok Pesantren Bustanul Ulum is the increase in santri's access to learning resources. Prior to technology, learning in pesantren was often limited to material taught by teachers and conventional learning resources, such as the yellow book and physical books. However, with technology, santri can now access various digital learning resources that can broaden their horizons.

Through the internet, santri can access articles, videos, scientific journals, and other teaching materials relevant to the learning material. For example, for learning religious sciences, they can access classic books in digital format, or even follow online religious studies from prominent scholars. In addition, with the online learning platform, santri can learn from various sources outside the pesantren, which allows them to gain a broader perspective (Sasmita & Sastra, 2020).

This greater access to learning resources also provides opportunities for santri to explore their interests and talents beyond the material taught in class. They can utilize technology to learn new skills, such as graphic design, programming, or even foreign languages, all of which can enrich their knowledge and skills

2. Interactivity in Teaching and Learning

One of the significant impacts of the application of technology in Pondok Pesantren Bustanul Ulum is the increased interactivity in the learning process. In the conventional teaching system, interaction between teachers and students is often limited. Generally, the material is delivered orally with minimal space for discussion or question and answer sessions. However, through the utilization of technology, learning activities become more dynamic and allow for more flexible application of various methods.

This increase in interactive elements encourages more active involvement of santri in learning, which contributes to a better understanding of the material. In addition, technology opens up opportunities for the use of more diverse learning media, such as videos and simulations, which can help explain complex concepts that are difficult to understand if only conveyed verbally.

3. Higher Learning Flexibility

One of the main advantages of technology in education is the flexibility it offers. At Pondok Pesantren Bustanul Ulum, technology makes it easy for students to learn outside of formal class hours. With access to various online learning platforms, santri can study anytime and anywhere, provided they have a supporting device and an internet connection.

This flexibility is very useful for santri who may have busy schedules or are limited in attending physical classes. They can organize their own study time, attend lessons or do assignments according to the time available. In addition, flexible learning also provides opportunities for santri to explore certain topics in more depth, without being bound by strict time constraints.

This flexibility also supports a more personalized learning approach based on individual needs. For example, students who find it difficult with certain material can repeat the lesson or look for additional references via the internet.

4. Improving the Quality of Teaching and Learning

With the adoption of technology, the quality of teaching at Pondok Pesantren Bustanul Ulum has also improved. Technology allows teachers to access a variety of higher quality learning resources, such as learning videos from trusted sources, scientific articles, or learning modules compiled by experts in their fields. Thus, teachers can enrich the material they teach and present it in a more interesting and innovative way.

In addition, technology also allows teachers to assess students' learning progress more objectively and accurately. By using online learning platforms, teachers can track students' progress through assignments, quizzes, and exams conducted online. The results of these evaluations can be used to provide constructive feedback and assist students in improving their weaknesses.

Challenges in the Implementation of Technology in Pesantren Education

Pesantren is an educational institution that has an important role in the world of education in Indonesia, especially in the field of Islamic religious education. Apart from being a place to explore the teachings of Islam, pesantren is also a place to develop character and instill noble values to students. However, in the midst of rapid technological advances, pesantren face great challenges in implementing technology in their education system. Technology, which should be an effective tool in improving the quality of education, often becomes an obstacle if not integrated properly.

Therefore, this paper will discuss various challenges faced by pesantren in implementing technology in education. These challenges include human resource factors, infrastructure, and other technical issues that hinder the effective use of technology in learning.

1. Human Resources (HR) Factors

Human resources in pesantren are one of the main challenges in implementing technology. Many teachers still lack the ability to use technology optimally. Most of the teachers in Pesantren are people who are used to traditional ways of teaching and educating. They focus more on the study of the yellow classical books (*kitab kuning*) and conventional Islamic religious teaching.

Most santri are also unfamiliar with the use of technology in their learning. The lack of digital skills among teachers and santri is a significant barrier. For example, ustadz who teach may not be familiar with using software for online learning or digital learning platforms. If they do not receive adequate training, they will struggle to integrate technology into their teaching methods.

2. Limited Infrastructure and Access to Technology

The biggest challenge faced by pesantren in implementing technology is limited infrastructure and adequate access to technology. At first, Pesantren Bustanul Ulum had limitations in terms of technology support facilities, had problems with unstable internet access, even regular electricity could be a problem.

Strategies for Overcoming Technology Platform Implementation Challenges

Islamic boarding schools are traditional Islamic educational institutions that have an important role in producing young people who are noble and have a good understanding of religion. However, along with the times and technological advances, Islamic Boarding Schools need to adapt to these changes in order to remain relevant and able to face the challenges of globalization. One way that can be done to improve the quality of education in Islamic Boarding Schools is by implementing a technology platform. Therefore, the right strategy is needed to overcome this challenge so that technology can be maximally accepted and utilized in the Islamic Boarding School environment. Among the strategies implemented by Bustanul Ulum Islamic Boarding School in overcoming the challenges of implementing technology platforms are:

1. **Socialization and Education:** Providing an understanding to all pesantren residents about the benefits and potential of digital technology in education. Socialization and education is a very important first step in overcoming the challenges of implementing technology in Islamic boarding schools. Bustanul Ulum Islamic Boarding School is one that still upholds traditional education methods that focus on teaching the yellowclassical books and halaqah, so the use of technology is considered irrelevant or even contrary to the pesantren tradition. Therefore, effective socialization and education need to be carried out to explain the benefits and potential use of technology in supporting the teaching and learning process in Pondok Pesantren.

This socialization aims to provide an understanding to all parties in Pondok Pesantren - leaders, ustadz, santri, and the surrounding community - that technology is not a threat to tradition, but can be a tool that supports and enriches the learning experience. Good socialization will help break down negative perceptions of technology and open minds that digital platforms can improve the quality of religious teaching as well as the skills needed by santri to face future challenges.

Education of stakeholders in Pondok Pesantren must be carried out thoroughly. Pesantren leaders need to be given an understanding of the great potential of technology in assisting the management of pesantren education and administration. In addition, ustadz and ustadzah who are teachers also need to be given training on how to integrate technology in their teaching process, either through e-learning platforms, the use of educational applications, or multimedia-based learning methods.

Santris, as the primary learners, should also be given an understanding of how technology can enrich their knowledge, both in the context of religion and general skills. For example, technology can help them access digital books, take part in online webinars or seminars, and utilize applications that can support the learning of Arabic, Qur'an, tafsir, fiqh, and so on.

2. **Human Resource Development:** Training and workshops to improve the digital skills of pesantren teachers and staff. Human Resource Development (HRD) in Pondok Pesantren is the second very important step in technology implementation. Without the development of qualified human resources, the implementation of technology platforms will be difficult to succeed. Therefore, conducting workshops for HR development is one of the strategies that need

to be done to ensure that both managers, teachers, and students have adequate competence in using technology.

Technological literacy shows the ability to utilize digital technology to process data and information. Meanwhile, human literacy must be mastered because it shows elements of soft skills or individual character development to be able to collaborate, be adaptive and be wise in the era of "flooding" information (Bakar, 2019).

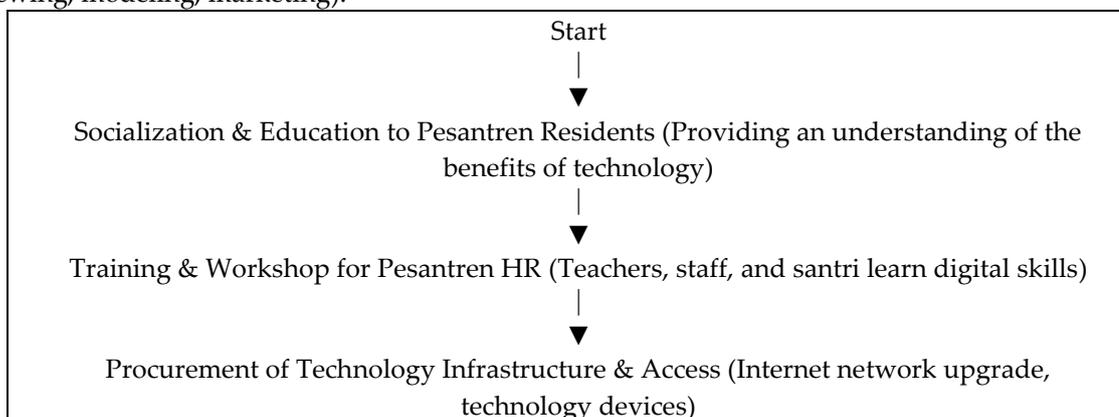
The Governing Board of pesantren is key in the successful implementation of technology in pesantren. Therefore, they need to be given training and workshops that aim to provide understanding and skills in managing technology-based pesantren. In addition to managers, workshops are also very important for ustadz and ustadzah so that they can understand ways to integrate technology in the learning process. Some types of workshops that can be provided include:

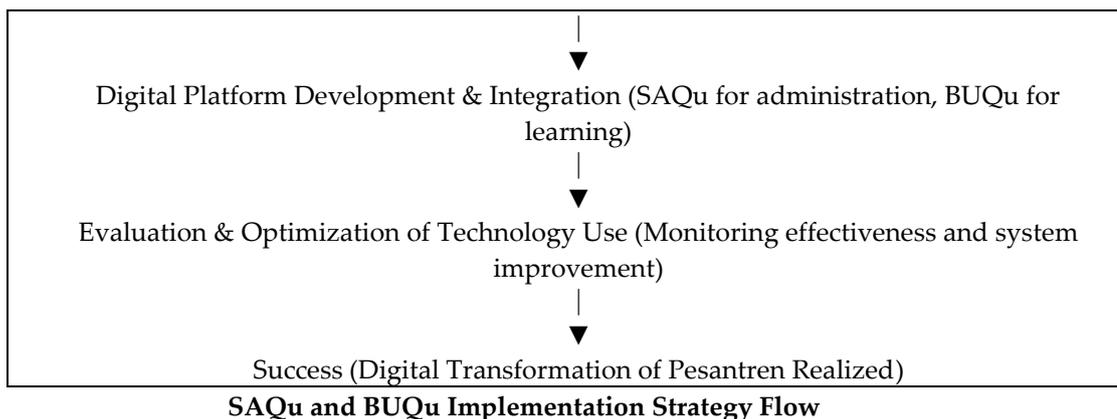
- a. Technology-Based Education Management: Teaches how technology can be used to manage pesantren administration, from attendance recording, curriculum management, student assessment, to pesantren financial management.
- b. Use of Information System: Train pesantren managers to use application-based information systems that can assist in managing santri data and pesantren information more efficiently and accurately.
- c. Technology for Pesantren Business Development: Pesantren often have the potential to develop economic ventures. Workshops on the use of technology for business management such as online stores, digital marketing, and e-commerce can be an added value.

Santri as learners in Pondok Pesantren must also be empowered in mastering technological skills.

Workshops for santri can include:

- a. Basic Digital Skills: Train students in basic skills such as computer usage, internet, and productivity applications (such as Microsoft Office or Google Workspace).
 - b. Programming and Coding: Provides basic training on computer programming that can open up opportunities for students to develop further technological skills.
 - c. Digital Content Creation: Train santri in the creation of digital content such as blogs, podcasts, or videos that can be used to spread religious messages or for personal development purposes. This includes creating digital content that is relevant to pesantren education materials and Islamic values.
3. Creating business innovations in Islamic boarding schools by developing the potential of students: One way to overcome the challenges of implementing technology platforms in Pondok Pesantren is to create business innovations that involve developing the potential of santri. Pesantren have great potential to develop technology-based economic ventures, which will not only help improve the welfare of the pesantren, but also directly benefit the santri in the form of new skills and business opportunities. The pesantren developed a Muslim fashion wear business named NingQu which involves santri as managers (both in design, material search, sewing, modeling, marketing).





CONCLUSION

Bustanul Ulum Islamic Boarding School has utilized digital technology through two main applications, namely SAQu which focuses on administrative management, and BUQu which is designed to support the education process. The BUQu application includes features such as e-learning, e-library, and e-business. The e-business feature plays a role in supporting the entrepreneurial activities of students, one of which is through the Muslim fashion brand "NingQu". The application of this technology has a positive impact on the quality of education in Islamic boarding schools, such as increasing students' access to learning resources, increasing interactivity in teaching and learning activities, flexibility in the learning process, and improving the quality of teaching and learning as a whole.

However, the implementation of this digital platform faces a number of challenges, especially in terms of limited Human Resources (HR) and infrastructure and internet access that are not evenly distributed. To answer this problem, the Islamic boarding school held a meeting between the board of trustees, the IT team, and the Islamic boarding school media team. From the results of the discussion, various solutions were born, including the implementation of socialization and education after the launch of the application, organizing workshops to increase HR capacity, and developing business innovations based on the potential of students. Further research is recommended to explore more deeply the long-term impact of digital platform usage on the character development and independence of students. In addition, further studies can examine the effectiveness of e-business features in encouraging entrepreneurial literacy among students and how this technology strategy can be replicated in other Islamic boarding schools with similar characteristics

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