



## Integration Of Digital Literacy In Pesantren Education: A Phenomenological Study of Experiences and Practices At Pesantren Al-Muttaqin Tasikmalaya

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### ABSTRACT

In the rapidly evolving digital era, digital literacy has become crucial for preparing santri to face global challenges; consequently, pesantren need to adopt innovative educational approaches that integrate technology into their learning processes. This study aims to analyze how pesantren transcend traditional boundaries by integrating digital literacy into their instruction. A qualitative phenomenological approach was employed to understand the unfolding phenomenon involving 30 participants representing the leadership, caregivers, ustad, and santri. Data collection involved observation, interviews, and documentation, while data analysis was conducted using Interpretative Phenomenological Analysis. The findings reveal that digital literacy in pesantren Al-Muttaqin is viewed as a means to expand access to knowledge, support learning, and strengthen communication and dakwah. Digital literacy is implemented through the use of various digital platforms and resources within a blended learning framework. Santri are permitted to bring smartphones for use during the learning process. The integration of digital literacy is understood as a process of technological adaptation grounded in Islamic values and pesantren traditions, emphasizing the critical, ethical, productive, and purposeful use of technology.

### ABSTRAK

*Di era digital yang terus berkembang, pentingnya literasi digital di kalangan santri menjadi krusial untuk mempersiapkan mereka menghadapi tantangan global. Pesantren perlu mengadopsi pendekatan inovatif yang mengintegrasikan teknologi dalam setiap pembelajarannya. Penelitian ini bertujuan untuk menganalisis bagaimana pesantren menembus batas-batas tradisional dengan mengintegrasikan literasi digital dalam pembelajarannya. Penelitian ini menggunakan pendekatan kualitatif jenis fenomenologi dengan melibatkan 30 partisipan yang mewakili unsur pimpinan, pengasuh, ustad dan santri. Teknik pengumpulan data dilakukan melalui observasi, interview dan dokumentasi. Analisis datanya dilakukan melalui Interpretative Phenomenological Analysis. Hasil penelitian menunjukkan bahwa literasi digital di pesantren Al-Muttaqin dimaknai sebagai sarana memperluas akses pengetahuan, mendukung pembelajaran, dan memperkuat komunikasi serta dakwah pesantren. Penerapan literasi digital berlangsung melalui pemanfaatan berbagai platform dan sumber digital dengan praktik pembelajaran blended learning. Setiap santri diperbolehkan untuk membawa Smart Phone yang bisa dipergunakan ketika proses pembelajaran. Integrasi literasi digital dimaknai sebagai proses adaptasi teknologi yang tetap berlandaskan nilai-nilai keislaman dan tradisi kepesantrenan melalui penguatan penggunaan teknologi secara kritis, etis, produktif, dan terarah.*

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## Introduction

Integrating digital literacy into pesantren education presents specific academic challenges, as these institutions are required not only to adapt to technology but also to uphold the traditions, values, adab, and scholarly authority that define their educational character. This issue has gained urgency as digital technology transforms how santri and ustad acquire, produce, evaluate, and disseminate knowledge; meanwhile, digital literacy skills unaccompanied by critical and ethical thinking capabilities risk leading to disinformation, uncontrolled technology use, and the influx of values and information incompatible with the orientation of Islamic education. In today's global era, humans face a situation where technological developments are undeniable. Even if the relationship between humans and technology today is described, the most appropriate word is friendship. Technology is always attached to humans because humans cannot be separated from technology. Of course, in practice, technology is quite effective in helping to complete human work, one of which is that the online learning has replaced the traditional in-person method of instruction. Numerous online resources, including WhatsApp, Moodle, Google Classroom, Zoom Meeting, Schoology, and other learning-supporting apps, can be used instead of in-person instruction. The advancement of information and communication technologies in the digital age has profoundly touched several facets of life including in the field of education. In the context of the Industrial Revolution 4.0 and Society 5.0, digital literacy has become an important need for students. However, on the other hand, it has the potential to have a negative impact on the development of students' character (Aflahah, 2022). The transformation of digital-based education provides a great opportunity to raise the standard of instruction and increase access to learning materials. However, integrating digital literacy into a religious-based education system, such as pesantrens, faces various challenges. In general, these limitations are related to facilities and resources (Adinugraha et al., 2025).

In many pesantren (Islamic boarding schools), students (santri) face obstacles when participating in technology-based learning activities. Issues encountered include student motivation (Dudin, 2018), a boarding school culture that restricts gadget usage within the premises, students' limited data access, teachers' readiness to deliver technology-based instruction, the absence of digital learning guidelines, and students' lack of engagement with or enjoyment of such learning methods (Murtadlo, 2020). The root cause of these problems lies in teachers' limited understanding of digital-based learning concepts; many remain unfamiliar with the various available platforms (Fajriana & Aliyah, 2019). Furthermore, educators face the primary challenge of teaching a diverse student body while simultaneously serving as exemplary role models (*uswatun hasanah*) for their students (Wasehudin et al., 2023). Pesantren are now compelled to adapt to changing times without compromising Islamic values (Hidayatulloh et al., 2023). The need to strengthen digital literacy is highlighted by the evolution of information technology, reflected in the year-on-year growth of internet penetration and usage in Indonesia. According to an APJII survey, the number of internet users rose to 196.71 million between 2019 and 2020, with students—including those in pesantren—making up the majority of the digital user base. In the context of pesantren education, digital literacy not only enhances students' information-access skills but also reinforces religious education through the integration of relevant technologies.

Studies on digital literacy include work by Sholahuddin, who noted that digital literacy implementation in pesantren involves utilizing platforms such as YouTube, Instagram, and Facebook, as well as distributing pamphlets via alumni; this allows the general public and alumni to access kitab kuning (traditional Islamic text) study sessions online (Sholahuddin & Anwar, 2023). Meanwhile, Murtadlo highlights that the failure to implement digital literacy in pesantren stems from the perception that gadgets cause

more harm than good for educational development within these institutions (Murtadlo, 2020). Conversely, the use of ICT in pesantren education offers significant benefits, such as enhancing the efficiency and effectiveness of the learning process and promoting the dissemination of Islamic teachings (dakwah) (Sholihah, 2012). Strengthening digital literacy involves implementing three components: individual competence, critical understanding, and communicative abilities (Setyaningsih et al., 2019). Echoing Setyaningsih, Sudrajat states that transformational leadership can boost digital literacy through initiatives such as workshops and leading by example. However, challenges persist, including teachers' limited technological proficiency and a lack of adequate internet access (Sudrajat et al., 2022).

These findings indicate that research on digital literacy within pesantren remains somewhat fragmented across dimensions such as technology utilisation, perceptions of technological impact, individual competence, and leadership support; consequently, it fails to fully elucidate how these dimensions integrate into the lived experiences of the pesantren community. Studies by Sholahuddin and Anwar (2023) highlight the potential of digital platforms to expand access to learning and dakwah, whereas Murtadlo (2020) reveals resistance rooted in concerns regarding the negative impacts of digital devices; together, these findings point to a tension between the need for digital adaptation and the effort to preserve pesantren values and traditions. Meanwhile, concepts regarding individual competence, critical understanding, and communicative abilities (Setyaningsih et al., 2019), alongside the role of transformational leadership (Sudrajat et al., 2022), demonstrate that digital literacy is not merely a matter of technological availability but also hinges on human capacity and a supportive institutional environment. Nevertheless, existing research tends to focus on actions taken, facilitating or inhibiting factors, and resulting benefits, without deeply exploring how members of the pesantren community experience, interpret, and navigate the process of integrating digital literacy into their educational lives. Thus, there remains scope for research to understand the interplay between the subjective experiences of the pesantren community, their digital practices, institutional policies, and pesantren values in shaping a distinctive and contextual pattern of digital literacy integration.

While digital literacy is increasingly recognised as a crucial component of contemporary education, existing studies largely focus on its implementation in formal schools, universities, and Islamic educational institutions in general; conversely, the integration of digital literacy within the distinctive cultural, religious, and pedagogical environment of pesantren remains relatively under-researched. Specifically, current research is limited in its examination of how digital literacy is experienced, interpreted, and practised by educators and students (santri) within pesantren—including how they navigate the opportunities and challenges of digital technology while upholding the values, traditions, and educational goals of the pesantren system. Furthermore, previous studies have tended to emphasise the availability or usage of digital technology rather than the lived experiences and meanings constructed by the pesantren community through their engagement with digital literacy. This leaves unanswered questions regarding how digital literacy is actually integrated into daily pesantren education and how this integration is perceived by those directly involved—such as the types of learning models developed to strengthen digital literacy, as well as the impacts and obstacles encountered during implementation. Therefore, a phenomenological study at Pesantren Al-Muttaqin Tasikmalaya is needed to explore the lived experiences, practices, challenges, and meanings associated with the integration of digital literacy within the pesantren context. Integrating digital literacy into the pesantren curriculum is a complex undertaking involving various challenges. First, there is a disparity in access to technology (Abidin, 2020). Second, there is a lack of digital literacy among both teachers and santri

(Sukiman, 2018). Third, pesantren harbor concerns regarding the negative influences of technology. While the digitalization of learning presents challenges, it also offers significant opportunities. It serves as a starting point for digitizing education within pesantren, paving the way for fully technology-based teaching and learning activities. This integration also creates major opportunities: first, it improves access to global Islamic literature, allowing santri to easily access digital texts and Islamic resources from around the world via the internet. Second, it fosters the development of 21st-century skills; digital literacy helps santri cultivate competencies such as critical thinking, communication, and collaboration—skills essential for the modern workforce (Partono, 2019). Third, it drives innovation in teaching methods. Digital technology enables the creation of more interactive learning approaches, such as instructional videos, educational apps, and Islamic-oriented e-learning platforms.

Unlike previous studies—which generally map digital literacy practices, identify institutional strategies, examine perceptions and challenges, or describe forms of technology integration within pesantren education—this study offers a novel interpretive perspective: it explains how the pesantren community experiences and assigns meaning to the process of integrating digital literacy into their educational lives. The study goes further by interpreting how members of the pesantren community negotiate the benefits and risks of technology, how the authority of pesantren values is employed to determine the boundaries and direction of technology use, and how these experiences shape a new understanding of digital literacy as an integral part of pesantren education. The novelty of this research lies in its focus on the lived experiences and daily practices surrounding the integration of digital literacy within the unique educational, cultural, and religious context of pesantren. Rather than viewing digital literacy merely as a technical skill for accessing and using digital technology, this study examines how digital literacy is experienced, interpreted, negotiated, and practised by members of the pesantren community. Adopting a phenomenological perspective, the research seeks to uncover how educators and students make sense of digital literacy while upholding the values, traditions, and pedagogical practices of the pesantren. This allows the institution to harness the benefits of digital literacy—which has gained prominence in recent years through platforms such as WhatsApp, Google Classroom, Zoom, YouTube, and other educational applications. The study specifically focuses on how the pesantren strengthens digital literacy through instruction that integrates religious teachings with science. By focusing on Pesantren Al-Muttaqin in Tasikmalaya, the research provides a context-specific understanding of how digital literacy is integrated into a particular pesantren environment, thereby addressing the lack of attention paid to the experiential and interpretive dimensions of digital literacy in pesantren education.

The study aims to explore and interpret the experiences and practices associated with digital literacy integration in pesantren education—including how educators and students perceive the benefits, challenges, opportunities, and implications for learning—to facilitate its incorporation into the curriculum at Pesantren Al-Muttaqin Tasikmalaya. This research contributes empirically by presenting evidence from an under-researched pesantren context; theoretically by enriching the discourse on digital literacy through a phenomenological perspective rooted in cultural context; and practically by offering insights to pesantren leaders and educators on developing digital literacy practices that are responsive to technological advancements without compromising religious values or institutional traditions. More broadly, the findings of this study can contribute to the development of context-sensitive digital literacy approaches within Islamic education and serve as a reference for future research on the intersection of technology, religious education, and pesantren culture. Furthermore, the results are expected to contribute to the development of a pesantren education system that is more adaptive to technological

advancements while upholding Islamic values. Digital literacy in pesantren is anticipated to be a positive breakthrough in the advancement of pesantren education.

Specifically, this study seeks to understand the lived experiences, interpretations, and practices of the Al-Muttaqin Tasikmalaya Islamic boarding school community regarding the integration of digital literacy into their lives and educational setting. The study addresses the following questions: (1) How do members of Pesantren Al-Muttaqin Tasikmalaya community experience and interpret their engagement with digital literacy within the context of Islamic boarding school education? (2) What are their experiences in implementing and developing digital literacy, as well as navigating the associated challenges, within their daily lives and educational practices? and (3) How do they interpret the process of integrating digital literacy with the values, traditions, and educational practices of the boarding school? Through these questions, the study goes beyond merely identifying forms of digital technology usage or institutional policies; it aims to uncover the experiences, perceptions, interpretations, challenges, and practices that shape the essence of digital literacy integration within the life and education of the Islamic boarding school.

## **Methods**

This study uses a qualitative-phenomenological research method because it is intended to understand the phenomenon of what is experienced by the research subject, for example, behaviour, perception, motivation, actions and others, holistically by using language and words to describe something in a particular natural setting while using a variety of natural techniques (Moleong, 2017). A phenomenological approach was selected because this study focuses on exploring the lived experiences of pesantren administrators, educators, and students—specifically how they understand, interpret, navigate, and implement the integration of digital literacy into life and education at Pesantren Al-Muttaqin Tasikmalaya, including how they negotiate the use of digital technology alongside pesantren values, traditions, and culture through firsthand experiences within a natural setting.

The research was conducted in October-December 2024 at Pesantren Al-Muttaqin Tasikmalaya. The research process was carried out intensively and continuously for three months to gain a deep understanding of the dynamics and experiences of the subjects in the context of digital literacy integration. This pesantren was chosen for several reasons. First, Pesantren Al-Muttaqin Tasikmalaya is under the auspices of the Al-Muttaqin Tasikmalaya Foundation, which has several educational institutions from kindergarten, elementary, junior high and high school levels with many complete facilities. Second, this pesantren uses a blended learning method, a combination of online and offline learning systems. Third, this pesantren has high literacy. Fourth, this pesantren allows its students to bring communication devices as learning media.

The number of informants involved in this study was 30 people. Interviews were conducted with 1 Head of the Pesantren, 3 caregivers, 6 ustads, 20 santries, and other parties involved. Purposive sampling, which involves selecting data sources with specific considerations because they are the most knowledgeable about our expectations or perhaps because they are the institution's head, was employed in this study. So on, and if necessary, the sample will be added using the snowball sampling technique, with directions from the previous resource person (Sugiyono, 2018).

Data collection was conducted through observation, documentation, and in-depth interviews from data sources. Informants in this study were selected purposively, using the phenomenological approach that emphasizes the depth of participant experience. Observations were conducted in a participatory and non-participatory manner in various

teaching and learning activities, both in the classroom and in non-formal environments such as computer rooms, digital libraries, and student study forums. Researchers were present directly to observe interactions, use of digital devices, and patterns of digital literacy integration in daily educational practices. Observations were conducted on six field visits, each lasting between 2 and 4 hours. In addition to recording relevant behavior and activities, researchers also used field notes and documentation (photos, videos, and digital learning materials) to strengthen the data. These observations aim to capture the context and meaning of the experiences of educational actors in integrating digital technology naturally and authentically into the life of the Islamic boarding school.

A crucial step following data collection is data analysis. In this study, data were analysed using Interpretative Phenomenological Analysis (IPA), which aims to gain an in-depth understanding of how participants experience and make sense of the phenomenon of digital literacy integration within pesantren education. IPA is appropriate for this study because the research focuses not only on identifying the forms or levels of digital technology usage at Pesantren Al-Muttaqin but also on gaining a deeper understanding of how the pesantren community experiences, makes sense of, and interprets their involvement in the integration of digital literacy. The Interpretative Phenomenological Analysis was conducted systematically through several stages: (1) reading and re-reading interview transcripts to build a deep understanding of each participant's experience; (2) making initial notes by identifying descriptive, linguistic, and conceptual aspects within the participants' narratives; (3) developing emergent themes from the initial notes while maintaining their connection to the participants' experiences; (4) identifying relationships between themes and grouping them into broader categories, or superordinate themes; (5) proceeding with an in-depth analysis of each case or participant before conducting a cross-case analysis; and (6) developing patterns or key themes that capture both the shared meaning of the experience and the unique aspects of each participant's experience. During the interpretation process, the researcher employed the principle of the double hermeneutic, whereby the researcher seeks to understand how the participants themselves understand and make sense of their own experiences. Thus, the Interpretative Phenomenological Analysis in this study not only identifies the forms of digital technology usage at Pesantren Al-Muttaqin Tasikmalaya but also interprets how the pesantren administrators, educators, and students experience, understand, interpret, and negotiate the integration of digital literacy with the values, traditions, and educational practices of the pesantren.

Data validity in this study was ensured through source and technique triangulation. Source triangulation was conducted by comparing information obtained from multiple informants, while technique triangulation involved comparing the results of interviews, observations, and documentation. Additionally, the researcher cross-checked the data and interpretations to ensure that the findings aligned with the conditions observed in the field.

This study involved participants—including pesantren leaders, caregivers, religious teachers (ustad), and students (santri), among others—and was conducted in adherence to research ethics principles. Before data collection, participants were informed about the study's objectives, procedures, and data usage, and provided their informed consent. The confidentiality of participants' identities and data was maintained, and the information was used solely for academic purposes.

## Results and Discussion

### Results

#### Digital Literacy in Pesantren; Meaning, Understanding, and Utilization

Digital literacy is "the ability to understand and use information in multiple formats from a wide variety of sources when it is presented via computers". Digital literacy is the ability to understand and use information from several digital sources displayed on computers in a variety of formats. UML stated understanding of digital literacy at Pesantren Almuttaqin Tasikmalaya as the leader of this Islamic boarding school:

"In my opinion, digital literacy is not just being able to open the internet or use social media, but more than that, how we can understand and use technology for learning purposes, looking for references or to do school assignments" (*Interview with UML, October 02, 2024*).

Based on this statement, digital literacy is considered important because, in this day and age, the world of education is changing rapidly, and computers are one of the tools that help us keep up with these changes without losing Islamic and pesantren values. The understanding of digital literacy at Pesantren Almuttaqin Tasikmalaya is understood and developed based on computer and information literacy concepts. Digital literacy consists of four main components: basic skills (underpinning), background knowledge of information, core competencies, and attitudes and perspectives of information (Gilster, 1997). The first component is basic digital literacy skills, this comprises fundamental computer literacy abilities, such as computer hardware and software, and basic literacy skills, such as reading, writing, and comprehending symbols to represent language and perform numerical computations. Regarding the ability to read and write, DLM, one of the santries, said:

"I learned how to read the scriptures in this pesantren. In addition, I was also trained on how to make lesson summaries and how to make papers for assignments for a particular subject. Moreover, Reading and writing skills are very important, especially in this day and age where we must be ready and able to use technology" (*Interview with DLM, October 03, 2024*).

Research findings indicate that students, teachers, and educational staff at Pesantren Al-Muttaqin Tasikmalaya demonstrate digital literacy experiences and practices that reflect basic proficiency in accessing, using, understanding, and leveraging digital technology to support learning activities at the pesantren. This can be seen from the students' ability to read, write, and understand information, which is part of their culture in daily activities. The high level of basic digital literacy skills at Pesantren Al-Muttaqin Tasikmalaya can be said to be a reasonable condition because they have had basic literacy skills and basic computer literacy skills since before they entered Pesantren Al-Muttaqin; besides that, they generally come from a middle to upper economic class background who already have various supporting devices at home. The second component is background knowledge of information, which refers to understanding how information is produced and disseminated, both digitally and non-digitally, and where it comes from (Goldman & Scardamalia, 2013).

The results of the study showed that students, ustad and education staff of Pesantren Al-Muttaqin Tasikmalaya have a good background in information knowledge

because they are supported by adequate facilities and infrastructure, considering that santries of Pesantren Al-Muttaqin are junior high and high school students who are in the same environment as the Islamic boarding school who are accustomed to technology-based learning and also supporting learning methods where they learn by implementing student active learning, where santries are encouraged to be able to develop themselves, be able to solve their problems and be able to continue learning independently throughout their lives (self-long life learner). The completeness of the library collection also supports the ability to provide adequate information sources and librarians who can provide qualified information services with the support of various user education/library and orientation/library instruction programs. The program was further developed into an information literacy program in pesantren. The user education or library instruction program is important to be taught at the elementary and advanced education levels and universities through information literacy education programs.

The third component is related to the main competencies of digital literacy, these include gathering knowledge, assessing information, producing and disseminating digital information, comprehending digital and non-digital information types, and having literacy and literacy abilities. The research results show that the Santries, ustad and the educational staff of Pesantren Al-Muttaqin Tasikmalaya have good digital literacy. One of the things that is a driving factor in the high understanding of the main competencies of digital literacy in santries, ustad and educational staff of the Al-Muttaqin Islamic boarding school is the existence of competency standards that the Almuttaqin Educational Institution has set that one of the main abilities that a santries must possess is being able to analyze the validity of information and utilize information technology scientifically, effectively, systematically and comprehensively in making decisions. Able to communicate, educate, and convey information effectively and responsibly verbally and in writing. The fourth component related to the attitudes and perspectives of information users includes the ability to learn independently, understand the use of information and understand copyright. Information users' attitudes and viewpoints are behaviours about how to use digital information and share content containing information from other sources (Azizah et al., 2021). Citations from other information sources using citation guidelines and bibliography compilation are examples of this component in the context of learning. The results of the study showed that santries, ustads and educational staff of Pesantren Al-Muttaqin Tasikmalaya have good attitudes and perspectives of information users due to the existence of academic ethics that must be adhered to by all academics under the Al-Muttaqin Tasikmalaya Foundation.

Based on the experiences of the Pesantren Al-Muttaqin community, engagement with digital literacy is understood as a process of adapting to technological advancements that offer benefits such as expanded access to learning resources, streamlined communication, support for the learning process, and enhanced dissemination of information and dakwah. These experiences demonstrate that digital literacy is not merely the ability to use digital devices and platforms, but also the capacity to select, comprehend, evaluate, and utilize information critically and responsibly. At the same time, the community recognizes challenges such as excessive device usage, exposure to information inconsistent with Islamic values, and disparities in digital proficiency among users. Consequently, engagement with digital literacy is viewed as an experience that requires balancing openness to technological progress with the ability to uphold the values, ethics, discipline, and character inherent to the Islamic boarding school tradition.

## Blended Learning: Digital Literacy in the Life and Educational Practices of Pesantren

To strengthen digital literacy, Pesantren Al-Muttaqin Tasikmalaya implements a blended learning policy. According to Driscoll & Carliner, Blended learning, as quoted by Istingsih, "integrates - or blends-learning programs in different formats to achieve a common goal", meaning integrating or integrating educational programs in various formats to accomplish shared objectives. A blend of several learning approaches is called blended learning. In order to accomplish the learning process' objectives, blended learning integrates two or more approaches and tactics (Istiningsih & Hasbullah, 2015). A learning approach known as blended learning blends in-person instruction with online learning (Kaliaskarova et al., 2022). By implementing this technique, face-to-face activities can continue while using online learning materials, particularly those based on blogs or the web. This is what was stated by Deputy Head of Curriculum SFF:

"In this pesantren, we implement a blended learning pattern combining direct face-to-face and online learning. This pattern was chosen to provide flexibility to teachers and students in expanding access to learning, and at the same time to adapt to the times without ignoring the values of pesantren" (*Interview with SFF, November 10, 2024*).

The blended learning is implemented at Pesantren Al-Muttaqin Tasikmalaya by combining online and offline learning. Teachers and education personnel are trained to use learning technology, such as Zoom, Google Meet, classroom, YouTube channels, etc. To support this activity, each student is allowed to bring a smartphone that can be used during the learning process and during school assignments, according to the rules that have been set. However, santries are required to collect and store all communication equipment, including Smart Phones, to the boarding school administrators at 17.00. The pesantren emphasizes that those using communication tools such as cell phones must be responsible for their use and the content they watch. Cellphones are only used to access learning books, such as books on tools, fiqh, tauhid, and tasawuf. This learning practice was made by involving several parties, including foundations, leaders, curriculum fields, students and treasurers. One of the reasons why students at Pesantren Al-Muttaqin are allowed to bring Smartphones was explained by BYN, one of the Homeroom Teachers:

"In our pesantren, santries can bring smartphones, but with quite strict rules. We realize that smartphones are now a means of communication and a very important source of learning. However, we also emphasize that their use must be responsible to not interfere with learning and religious activities" (*Interview with BYN, November 10, 2024*).

This data shows that in line with what Graham and Ure said, the components of blended learning include three main components, specifically autonomous learning, in-person learning, and internet learning (Istiningsih & Hasbullah, 2015). Pesantren Al-Muttaqin Tasikmalaya applies these three components. Online learning is carried out in this pesantren where learning uses internet technology to access learning materials that allow for learning interactions between fellow santries or with ustad anywhere and anytime. In addition, learning in this Pesantren uses a face-to-face model, which brings together teachers or ustad with santries or pupils in one room to study. Various learning methods are usually used, including lecture methods, assignment methods, question and answer methods, demonstration methods, and other methods. In addition to these two

components, independent learning is also used, by using the Internet to acquire information or educational resources, Santrians can learn independently.

The Pesantren Al-Muttaqin community's experience implementing and developing digital literacy shows a gradual shift toward using technology to support learning, communication, knowledge acquisition, administration, and information dissemination. While various digital devices and platforms facilitate information access and broaden learning resources, practical challenges persist—including disparities in digital proficiency, limited facilities and internet access, uncontrolled device use, and the need to filter information that conflicts with Islamic values. These experiences have prompted the community to cultivate more selective, critical, productive, and responsible technology-use habits; consequently, digital literacy has evolved beyond a mere technical skill into an integral part of the school's educational practices, remaining grounded in character building and the reinforcement of Islamic boarding school values.

### **Interpreting the Process of Integrating Digital Literacy with the Values, Traditions, and Educational Practices of Pesantren**

One of the flagship programs at Pesantren Al-Muttaqin Tasikmalaya is the Science and Qur'an Integration program. The integration of science and the Qur'an is to link the verses of the Qur'an with general sciences or link general sciences with verses of the Qur'an such as science, social sciences, humanities and other disciplines. The Science and Qur'an Integration program is held both in pesantren and in schools, especially in high schools. When a teacher at school teaches general subjects, he connects and relates what is learned with the verses of the Qur'an. Likewise, when a Ustad at Pesantren teaches Islamic sciences, he connects what is learned with general knowledge. The purpose and integration of science and the Qur'an is to increase the scientific insight of students, both general knowledge and religious knowledge, so that they can contribute with the religious knowledge they have in modern life. The statement above is reinforced by the statement of the Head of Pesantren Al-Muttaqin, UJM:

"The Science and Qur'an Integration Program at this pesantren is designed to bridge modern science with Islamic values. We believe science and the Qur'an do not contradict each other, and can even complement each other in understanding Allah's creation" (*Interview with UJM, October 25, 2024*).

Through this program, santrians are invited to learn scientific concepts such as physics, biology, and mathematics while also looking at relevant verses of the Qur'an as a spiritual basis and motivation for learning. The goal is for students to not only master worldly knowledge but also have a strong moral and spiritual foundation so that they can become intelligent and noble individuals in facing the development of the times. Based on these three views, integration encourages collaboration between different disciplines to generate new insights and more effective solutions. Integration of science in this context can lead to deeper understanding, as different disciplines can contribute to the construction of knowledge based on experience and social collaboration. The integration approach of science allows us to understand the system in a broader context, using principles from different disciplines.

However, some of these things are inseparable from several obstacles or constraints for the management of Pesantren Al-Muttaqin Tasikmalaya in implementing several digital literacy programs at the first Islamic boarding school, the varied backgrounds of santrians. Santrians have different backgrounds in terms of family, region of origin, educational background and others. Second, santrians who do online learning with learning via Zoom, Google Meet or other media experience boredom because learning is

still limited to the monitor screen. Third, the motivations of the santries vary; some study at pesantren out of their own desire, awareness, and drive to study religion, especially the Qur'an, but there are also those who are forced and ordered by their parents. Fourth, because the santries of Pesantren Al-Muttaqin are students at Al-Muttaqin Middle School or High School, which implements a full-day education system, many santries feel exhausted when they have to study in the afternoon or evening because of the many assignments they have to complete. Fifth, there are still limited human resources, especially Ustad, who truly understand and comprehend the science of the Qur'an and are able to integrate it with digital-based media. Sixth, monitoring of all santries, especially learning achievements, has not been maximized.

In the Science and Quran integration program, digital literacy is demonstrated through the use of various digital devices and platforms as tools to support the search for, processing of, and presentation of information related to the learning material. Students utilize devices such as smartphones or computers to access digital resources, seek supplementary information, study Science and Quranic content, and communicate with their instructors or peers. The community at Pesantren Al-Muttaqin in Tasikmalaya views integrating digital literacy with the pesantren's values, traditions, and educational practices as a process of technological adaptation that prioritizes Islamic principles and the school's distinctive character as its core foundation. This integration is not understood as the replacement of pesantren traditions with digital technology, but rather as a selective effort to leverage technology to enhance learning, broaden access to knowledge, facilitate communication, and advance dakwah—all without compromising values such as adab (proper conduct), discipline, exemplary behavior, and the depth of Islamic scholarship. The community's experience demonstrates that successful integration hinges on the ability to manage technology usage, filter information, and steer its application to remain aligned with the pesantren's educational goals. Thus, the integration of digital literacy is interpreted as an adaptive, contextual educational transformation, in which technology is embraced as a supporting tool. At the same time, pesantren values and traditions remain the foundation guiding its use.

## **Discussion**

Gilster defines digital literacy as the ability to understand and use information in various formats from various sources when presented via computer, with an emphasis on the skills to critically evaluate the content of the information, not just the technical ability to operate digital devices (Gilster, 1997). Developing this idea, Bawden formulated a digital literacy framework that includes four main components, namely: (1) underpinnings or basic skills that form the foundation, (2) background knowledge or background knowledge about information, (3) core competencies or core competencies in finding, evaluating, and utilizing information, and (4) attitudes and perspectives or attitudes and perspectives or attitudes and perspectives or attitudes and perspectives needed to interact with information ethically and responsibly (Bawden, 2001, 2008). This framework has been widely adopted in digital literacy research over the past decade (Tang & Chaw, 2016; Pangrazio & Sefton-Green, 2020; Wahjusaputri & Supriatna, 2022) because it is considered capable of integrating cognitive, technical, and affective dimensions relevant to the needs of 21st-century education, including in religious educational environments such as Islamic boarding schools. In the context of Islamic boarding schools, the integration of digital literacy through this framework not only facilitates technological mastery but also shapes the character of students. Hence, they are able to filter and utilize digital information wisely in accordance with Islamic values (Wardani & Rahman, 2024). For santries to safely and successfully navigate the digital

world, they must be taught the fundamentals of digital literacy, including communicating, interacting with others, and staying safe online. Considering the significance of digital literacy in the Industrial Revolution era 4.0, pesantren as Islamic educational institutions that have unique characteristics must strive to continue to innovate, modify and design their curriculum in order for their graduates to have the abilities and skills required to enter the global period, survive, and respond to the complexity of the demands of society and the times (Saridudin et al., 2024).

When viewed through the lens of the seven elements of digital literacy proposed by Beetham, Little, and McGill, the experiences and practices of the Pesantren Al-Muttaqin community demonstrate connections to information literacy, digital scholarship, learning skills, ICT literacy, career and identity management, communication and collaboration, and media literacy (Beetham et al., 2012). These connections show that digital literacy within the pesantren is not merely the technical skill of using digital devices; rather, it is a process of acquiring, managing, evaluating, communicating, and using digital information to support learning activities and life within the pesantren. First, The ability of Pesantren Al-Muttaqin santries to find, assess, and apply the necessary information efficiently is known as information literacy. Second, Pesantren Al-Muttaqin santries' active involvement in academic activities to use data from digital media as a reference is a component of digital scholarship, for example in research practices or completing school assignments or Islamic boarding school activities. Third, Learning skills are the ability of students to effectively learn various technologies that are fully equipped for both official and casual educational activities. Fourth, the ability of pupils to embrace, modify, and utilize digital devices and ICT-based media, along with both apps and services, is known as ICT literacy, or information and communication technology literacy. The ICT-based media in question include devices like computers, LCD projectors, powerpoints, cellphones, and tablets utilized by their comprehension, particularly if they are linked to the internet as the primary learning platform. Fifth, students' methods or skills for controlling their online personas are related to career and identity management. Several distinct avatars connecting with multiple parties nearly simultaneously can be used to reflect an individual's identity. Sixth, using digital networks for communication and collaboration allows countries to participate actively in learning and research. Seventh, santris' critical reading skills and innovative academic and professional communication in various media are examples of media literacy. Mastering these competencies is crucial for santri in today's global era, given that not all pesantren possess the capacity to achieve this.. This aligns with what Jenkins said: information and communication technology (ICT) proficiency is a crucial component of education in the twenty-first century. According to Jenkins et al. in their work on "Confronting the Challenges of Participatory Culture: Media Education for the 21st Century," individuals who can access, analyze, and produce information using ICT have an advantage in the information society (Jenkins et al., 2009). This shows that students from middle- to upper-income backgrounds with access to devices tend to be more skilled in digital literacy (Azizah et al., 2021).

Pesantren Al-Muttaqin Tasikmalaya approaches digital literacy—encompassing its understanding, interpretation, and practical application—based on four aspects: the students' foundational skills, their background knowledge regarding information, their core competencies, and their attitudes and perspectives toward information. Foundational skills pertain to the students' abilities to read, write, and comprehend information (Lisyawati et al., 2023). In terms of background, the students already possessed basic literacy and computer literacy skills before enrolling at Al-Muttaqin. Consequently, core competencies—comprising both soft and hard skills—are shaped alongside the development of positive attitudes and perspectives as information users, fostered by the academic ethics that the entire academic community is required to uphold.

This four-aspect framework mirrors Gilster's digital literacy model, which identifies four core components: basic literacy, information literacy, communication-collaboration literacy, and an understanding of digital ethics (Saepurohman et al., 2025). Integrating an Islamic-value-based curriculum with technology in pesantren has proven effective in enhancing students' technical, soft, and conceptual skills, while simultaneously producing graduates ready to compete professionally without losing their Islamic identity (Rochim et al., 2025). The development of digital competence among santri (Islamic boarding school students) encompasses four components—digital skills, digital culture, digital ethics, and digital safety—and is supported by the pesantren through strengthened knowledge, mentoring, and supervision (Rustandi & Kusnawan, 2023). Furthermore, practical, work-based digital literacy training within the pesantren environment equips students with technological skills and presents creative challenges to foster their potential in the field of information technology (Fathullah et al., 2023). This aligns with what Piaget said: learning is an active process in which individuals build knowledge through experience and interaction (Piaget, 1976). The ability to assemble knowledge in the context of digital literacy refers to the ability to integrate various information into a greater understanding, per the principles of constructivism (Fitriyah et al., 2024). The quality of social interaction is very important in digital education, where collaboration can enrich the learning process. In addition, Wheeler, in "Learning with Digital Technologies", notes the importance of evaluating information in the digital world (Wheeler, 2014). Evaluating sources of information—whether it is news, articles, or social media content—is an important skill in ensuring the accuracy and credibility of information. This evaluation guides individuals in choosing relevant and reliable information.

Crucially, the experience at Pesantren Al-Muttaqin shows that integrating digital literacy is not merely a matter of the community's readiness to use technology; rather, it is a process of negotiating between the demands of digital transformation and the effort to uphold Islamic values and the pesantren's distinct identity. Access to technology does not automatically yield mature digital literacy; indeed, broader access to information heightens the need for critical thinking skills, usage control, and pedagogical guidance. Therefore, the central issue is not whether to accept or reject technology, but who defines its purpose, how its use is directed, and which values underpin the filtering and interpretation of digital information. These findings underscore that digital literacy within the context of pesantren education differs fundamentally from general digital competence; its success hinges on the ability to integrate technology with *adab* (proper conduct), ethics, discipline, and the orientation of Islamic education. Without this integration, digital transformation risks merely increasing technology use without fostering meaningful improvements in learning quality or the santri's character development.

This study also reveals practices employed by Pesantren Al-Muttaqin Tasikmalaya to strengthen digital literacy: blended learning. Instruction is conducted flexibly rather than relying solely on face-to-face interaction (Ma'rifatani et al., 2026); however, this flexibility refers to a combination of learning modes (Ningtyas & Sihombing, 2023), not a complete abandonment of teacher guidance. In the context of Islamic boarding schools, blended learning appears to be a relevant strategy for enhancing digital literacy because it integrates face-to-face instruction with structured digital learning, rather than entirely replacing face-to-face interaction (Sugito, 2024). This policy is viewed as a means to improve students' 21st-century competencies—including digital literacy, collaboration, and problem-solving—while upholding Islamic values (Husairi, 2025). Furthermore, the policy is seen as fostering learner autonomy, enthusiasm, and more adaptable teaching strategies, particularly when combined with digital tools and

independent learning (Wahdatunnisa et al., 2025). To strengthen the implementation of digital literacy, students at this pesantren are permitted to bring smartphones. Smartphones help expand students' access to teaching materials, Islamic applications, learning platforms, and discussions outside the classroom (Zikri, 2023). Santries involved in creating digital content, for instance, demonstrate greater creativity and improved digital skills. Smartphones also support independent study and learning across different settings through blended or mobile learning. However, in practice, this policy entails real risks if access is not controlled. In fact, many pesantren impose restrictions due to concerns regarding unfiltered content, unmonitored communication, and a decline in study concentration (Hefner, 2022). Blended learning, as implemented by Pesantren Al-Muttaqin integrating offline learning methods with online learning, as stated by Garrison & Vaughan in their book "Blended Learning in Higher Education", this approach supports a richer learning experience (Garrison & Vaughan, 2008). In Pesantren, in addition to giving santries access to digital resources, online and in-person instruction gives them the freedom to learn as best matches their learning preferences. In addition, independent learning implemented in Pesantren, in line with what was described by Knowles in his theory of adult learning, shows that individuals who take the initiative in their learning process tend to have higher motivation and achieve better results (Knowles, 1975).

An interesting aspect of the practices employed by this pesantren is that it acts as a bridge between traditional and modern models without eliminating the *sorogan* method or personalized guidance. The success of this strategy is naturally heavily influenced by pedagogical design, teacher readiness, and institutional support. While digital programs in the pesantren have a tangible impact on student literacy, they require sustainable management and an emphasis on the ethical use of technology (Saepurohman, 2025). Consequently, this pesantren policy would be highly compelling if accompanied by mentoring, collaborative projects, teacher training, and a flexible curriculum grounded in Islamic values (Rochim et al., 2025). The most accurate analysis is that blended learning is effective not merely because it reduces reliance on face-to-face interaction, but because it integrates flexibility, pedagogical guidance, digital projects, and ethical development within the pesantren ecosystem.

Other findings reveal that Pesantren Al-Muttaqin Tasikmalaya integrates science and the Quran into its curriculum. This process aims to strengthen digital literacy within the institution. This integration involves linking Quranic verses with general sciences—such as natural sciences, social sciences, the humanities, and other disciplines—or vice versa. At this Pesantren, the integration of science and the Quran serves to eliminate the dichotomy between religious and general knowledge, thereby fostering an educational approach that is holistic, contextual, and relevant to modern challenges (Mustafidin et al., 2024). The concept of integrating technology into learning is further reinforced when framed by Islamic ethics, ensuring that technology is utilized responsibly for education, dakwah, and social service (Manaf et al., 2026). According to Repko in his book "Interdisciplinary Research: Process and Theory", integration of science emphasizes an interdisciplinary approach, which includes understanding and using methods and theories from various disciplines to solve complex problems (Repko, 2008). While Vygotsky, in "Mind in Society", states that knowledge is built through social interaction and contextual learning (Vygotsky, 1978). Unlike both of them, Capra, in the book "The Hidden Connections", explains that many phenomena in the real world are complex and consist of many interacting elements (Capra, 2002). This data shows that the learning of santries at Pesantren Al-Muttaqin is integrated between learning activities held at school and student activities in the Pesantren dormitory (Sofanudin et al., 2021). This integration pattern is expected to be an adequate life skill for students both personally, socially, academically and vocationally (Saridudin, 2021).

Based on the explanation above, it can be said that the planning and implementation of learning in pesantren that are integrated with technology have a positive impact, namely an increase in the quality of learning (Farihin et al., 2026), helping to prepare students to face technological changes, and enriching Islamic understanding. This aligns with what Yahya said: implementing digital literacy in learning by utilizing technology and digital media is relevant today (Yahya, 2023). Therefore, digital literacy is important to be implemented in pesantren; this is a manifestation of a wider mandate or the increasingly broad role of pesantren (Basri, 2014), in addition to facilitating access to digital learning resources, facilitating learning and searching for information and references from trusted sources, in addition to digital literacy as a medium for searching for discussion materials, assignments, to deepen the lesson material delivered by the ustad, and to expand the reach of pesantren in order to expand access to Islamic propagation and preaching further.

From an analytical perspective, the policy at Pesantren Al-Muttaqin would appear robust if the intended integration encompasses epistemological, curricular, and practical dimensions simultaneously, rather than merely appending religious content to general subjects. Success is more likely when this integration is supported by project-based learning, teacher training, digital infrastructure, and adaptive pesantren leadership (Mustafidin et al., 2024). However, the greatest challenge lies in the fact that the policy's success will hinge heavily on whether integration is genuinely realized within instructional design, digital projects, teacher competencies, and technology governance, rather than remaining solely at the curriculum level (Saridudin, 2020).

Critically, the findings of this research show that integrating digital literacy at Pesantren Al-Muttaqin Tasikmalaya is not just a process of integrating technology into learning practices, but a process of negotiating values between digital modernization and the continuity of Islamic boarding school traditions. In this context, technology functions as a "supporting instrument," showing that pesantren do not accept technology deterministically but instead place it under the control of values, educational goals, and pedagogical authority aligned with Islamic educational values. However, this condition also presents a more fundamental problem: the potential gap between normative principles for using technology in line with pesantren values and the actual practices of pesantren residents in navigating the ever-changing flow of digital information. Therefore, the success of digital literacy integration is not simply measured by the intensity of use of digital devices or platforms, but by the extent to which technology can be transformed into a critical, ethical, and productive means of learning, developing knowledge and preaching without shifting the position of pesantren values as the main framework in determining the boundaries, goals and direction of the transformation of Islamic education.

This research is relevant to be raised considering that digital literacy is not only owned by general educational institutions but is also relevant to be practised in all educational institutions, including pesantren. Digital literacy in pesantren is expected to strengthen the function of pesantren as stipulated in Law No. 18 of 2019 concerning pesantren, namely the function of education, preaching and community empowerment. This paper reinforces the views of Gilster (1997), Saepurohman (2025), Fathullah (2023), Bawden (2001, 2008), Beetham (2012), Rochim (2025), and Hefner (2022), who argue that literacy education in pesantren can enhance the digital literacy awareness of santri. Pesantren play a crucial role in shaping santri's digital attitudes, making them more receptive to digital adoption without compromising Islamic values; furthermore, digitalization is seen as a means to improve santri's technological and entrepreneurial literacy. This paper disagrees with Buckingham (2020), Jones (2022), Potzsch (2021), and Harrison (2025), who contend that digital literacy is no longer relevant to the digital

practices of today's youth and argue that the digital literacy framework overlooks the socio-economic structures of technology and digital capitalism.

The findings of this study hold significant implications for the development of pesantren education in the digital era, particularly regarding the positioning of digital literacy not merely as a technical skill for using technology, but as an integral part of the educational process that must be aligned with Islamic educational values, ethics, morality, and the distinctive character of the pesantren. This integration necessitates strengthening the digital skills of both students (santri) and teachers, alongside guidance to maintain a balance between technology usage and religious values and pesantren culture. However, this study has limitations due to its phenomenological approach focusing on a single institution—Pesantren Al-Muttaqin Tasikmalaya; consequently, the findings primarily reflect the experiences and interpretations of the subjects within that specific context and cannot yet be generalised to all pesantren, which possess diverse characteristics and cultures. Therefore, future research could focus on comparative studies across multiple pesantren in Indonesia, longitudinal studies to examine the evolution of students' digital literacy over time, and developmental research aimed at formulating a digital literacy integration model that systematically combines digital competence with pesantren educational values. In this way, the study of digital literacy in pesantren education can expand beyond the mere utilisation of technology to address how digital transformation can occur adaptively without compromising the identity, traditions, orientation, and unique character of the pesantren as an Islamic educational institution.

## **Conclusion**

At Pesantren At Al-Muttaqin Tasikmalaya, the capacity to use technology to obtain, evaluate, and produce information is known as digital literacy. Santries demonstrate an active understanding of digital literacy, not only as a learning tool, but also as a medium to strengthen Islamic and social values. The use of technology in learning creates an interactive environment that is relevant to the needs of the times so that students can apply these skills in their daily lives. The application of the blended learning model in Pesantren integrates face-to-face learning with online learning and also independent assignments. This practice is carried out to provide flexibility in the teaching and learning process and to improve students' digital skills. With the availability of digital devices and resources, students can learn independently and collaboratively, which, in turn, supports the development of digital literacy more effectively. The integration of science and the Qur'an is a strategic approach to strengthening digital literacy. Through learning that links scientific concepts with the teachings of the Qur'an, santries not only enrich their academic knowledge but also deepen their spiritual understanding. This encourages santries to use technology ethically and responsibly, so that digital literacy does not stand alone but is integrated with Islamic values.

This study contributes contextually and empirically to the study of digital literacy in Islamic education by revealing the experiences and interpretations of the pesantren community regarding the integration of digital technology into the educational process at Pesantren Al-Muttaqin, Tasikmalaya. Theoretically, the research findings enrich the discourse on digital literacy within the context of pesantren education by demonstrating how pesantren values—such as character building, discipline, adab (proper conduct), and scholarly authority—interact with the use of digital technology. Practically, the results offer a basis for reflection for pesantren administrators when designing digital literacy integration strategies that go beyond a mere focus on technical skills and also consider the values, ethics, and educational objectives of the pesantren. Furthermore, these

findings can guide educators in developing digital-based learning practices that preserve the distinctive characteristics and institutional identity of the pesantren.

Although the results of this study indicate that digital literacy at Pesantren Al-Muttaqin not only functions as an educational medium but also as a means to strengthen Islamic values taught at pesantren, several weaknesses need to be considered. One of these weaknesses is the potential dependence of students on technology if not balanced with proper supervision. In addition, although the blended learning model provides flexibility, it may also present a gap in the digital skills of santries from different backgrounds. Recommendations for further research are to explore the long-term impact of technology use on the development of santri's character and religion and to evaluate the effectiveness of supervision of smartphone use in learning. Further research can also deepen the analysis of the challenges pesantren face in implementing the integration of science and the Qur'an and how it can be kept relevant and effective in supporting the educational goals of pesantren.

## **AI Disclosure**

The author used Grammarly to check and improve English grammar, spelling, punctuation, and writing style. The author has reviewed and edited the output and bears full responsibility for the content of this publication.

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## **Author Contributions**

The authors' contributions to this article are as follows: Author 1 contributed to conceptualization, methodology, supervision, research resources and writing. Author 2 contributed to investigation, formal analysis, and data validation. Author 3 was responsible for writing the initial draft. Author 4 contributed to writing, reviewing, and editing the manuscript. Author 5 contributed to validation, writing, reviewing, and editing the article. All authors reviewed and approved the final version of the manuscript.

## **Disclosure Statement/Conflict of Interest**

"The authors declare that there is no potential conflict of interest related to this article."

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