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Integration of Digital Literacy in PAI Learning in the 5.0 Era at SMKN 3 Cilegon

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Abstract: The acceleration of digital technology demands adaptation of education in the era of Society 5.0, including in Islamic Religious Education (PAI) learning, which still tends to be conventional. At SMKN 3 Cilegon City, the utilization of digital literacy in improving the quality of learning is not optimal. Digital literacy encompasses not only technical skills, but also critical, ethical, creative, and productive skills. This study aims to analyze the integration of digital literacy in PAI learning to improve the quality of student learning. The method used is descriptive qualitative with students of SMKN 3 Cilegon City as subjects. Data analysis uses an interactive model through the stages of reduction, presentation, conclusion and verification of conclusions. The results show that the integration of digital literacy is carried out through the use of technology in learning, project-based implementation, strengthening the role of teachers as facilitators, and the use of technology for personalized learning, which overall contribute to improving the quality of learning.

Abstrak: *Percepatan teknologi digital menuntut adaptasi pendidikan di era Masyarakat 5.0, termasuk dalam pembelajaran Pendidikan Agama Islam (PAI), yang masih cenderung konvensional. Di SMKN 3 Cilegon City, pemanfaatan literasi digital dalam meningkatkan kualitas pembelajaran belum optimal. Literasi digital tidak hanya mencakup keterampilan teknis, tetapi juga keterampilan kritis, etika, kreatif, dan produktif. Penelitian ini bertujuan untuk menganalisis integrasi literasi digital dalam pembelajaran PAI untuk meningkatkan kualitas pembelajaran siswa. Metode yang digunakan adalah deskriptif kualitatif dengan siswa SMKN 3 Cilegon City sebagai subjek. Analisis data menggunakan model interaktif melalui tahapan reduksi, penyajian, kesimpulan, dan verifikasi kesimpulan. Hasil penelitian menunjukkan bahwa integrasi literasi digital dilakukan melalui penggunaan teknologi dalam pembelajaran, implementasi berbasis proyek, penguatan peran guru sebagai fasilitator, dan penggunaan teknologi untuk pembelajaran personal, yang secara keseluruhan berkontribusi pada peningkatan kualitas pembelajaran.*

Keywords: Digital Literacy, Learning Process, Society 5.0.

INTRODUCTION

The rapid development of information and communication technology has brought significant changes to various aspects of life, including education. The Society 5.0 era emphasizes the use of human-centered digital technology to improve the quality of life and well-being of society (Redhana, 2024). In the context of education, this demands innovation in the learning process to adapt to current developments. One possible approach is to integrate digital literacy into Islamic Religious Education (PAI) instruction. Through this integration, students not only gain a theoretical understanding of religion but also are able to utilize digital technology wisely, critically, and responsibly in accordance with Islamic values (Hasanuddin et al., 2025).

Advances in digital technology have transformed the way humans acquire, manage, and disseminate information. This phenomenon has also influenced the education system, which is required to be more innovative and adaptive to current developments. The Society 5.0 era emphasizes the importance of collaboration between technology and human capabilities in creating solutions to various life problems. In the educational context, digital literacy is one of the essential competencies that students must possess. Therefore, the integration of digital literacy into Islamic Religious Education (PAI) learning is necessary so that students can understand Islamic values and develop the ability to utilize technology positively (Pratiwi et al., 2024). Thus, Islamic Religious Education (PAI) learning not only focuses on cognitive aspects but also shapes the character of students who are religious, critical, and adaptive to technological developments.

Amidst the increasingly massive digital transformation, the world of education is required to adapt to the various changes occurring. The Society 5.0 era presents the concept of a society that harmoniously integrates advanced technology with human life. This condition requires students to have strong digital literacy skills to filter and utilize information appropriately (Judijanto et al., 2024). In Islamic Religious Education (PAI) learning, the integration of digital literacy is crucial to help students understand Islamic teachings more broadly, contextually, and relevantly to modern life. By utilizing various digital media and learning resources, the Islamic Religious Education (PAI) learning process is expected to be more engaging, interactive, and able to improve the quality of student learning.

The implementation of digital literacy research in Islamic Religious Education (PAI) learning is carried out by integrating the use of digital technology as a learning resource and medium. Teachers utilize devices such as computers, smartphones, and online learning platforms to access various Islamic information sources, such as e-books, learning videos, articles, and digital Quranic interpretations. Through these activities, students are trained to search for, understand, and evaluate information obtained from digital media critically and responsibly. Thus, digital literacy not only helps students understand PAI material but also builds their ability to use technology wisely. Furthermore, digital literacy is implemented through various interactive learning activities, such as online discussions, digital project-based assignments, and the creation of presentations or videos related to Islamic Religious Education (PAI) material. These activities encourage students to be more active, creative, and collaborative in the learning process. This research demonstrates that the application of digital literacy in Islamic Religious Education (PAI) learning can increase student interest in learning, understanding of religious material, and the ability to critically and responsibly filter religious information circulating in the digital world.

The Independent Learning Policy, which encourages flexible learning and the use of digital platforms, demonstrates that the digitalization of education has become a strategic direction for educational

development in Indonesia. Amidst this dynamic, the concept of Society 5.0 emerged as a response to technological developments that are not only oriented towards efficiency but also focused on solving human problems (Solissa et al., 2024). Society 5.0 encourages people to use digital technology wisely, creatively, and humanely (Alimohammadlou & Khoshsepehr, 2023). In the world of education, this era demands that students master not only academic knowledge but also digital skills that enable them to participate in an interconnected global ecosystem.

However, the digitalization of education faces significant challenges if digital literacy is not a core competency for educators and students. Many studies show that even when technology is available, its use remains limited due to low digital literacy skills (Afrina et al., 2022).This emphasizes that the digitalization of education goes beyond providing devices and internet connections; it requires strong digital literacy as a primary foundation.

This article explores in depth the urgency of digital literacy in the digitalization of education in the era of Society 5.0, the challenges faced, and strategies for strengthening digital literacy that can foster an adaptive and sustainable educational ecosystem. Using an analytical approach based on a literature review, this article provides a comprehensive overview of how digital literacy is a key pillar of educational transformation in Indonesia.

In Indonesia, digital literacy has become a key component since the launch of the National Literacy Movement (GLN) in 2017 by the Ministry of Education and Culture (Agung et al, 2020). Digital literacy has subsequently become an integral part of the Independent Curriculum (Kurikulum Merdeka), particularly in project-based and technology-based learning (Farid, 2023). Conceptually, digital literacy encompasses not only the ability to use technology but also critical thinking skills, media ethics, and the ability to collaborate in digital spaces ((Hobbs, 2011). According to UNESCO (2022), digital literacy is "the ability to access, understand, evaluate, and create information through digital technology in an ethical and effective manner (Nu'man, 2023)."

Gilster emphasizes that digital literacy encompasses not only technical skills but also cognitive and social abilities to understand the meaning of information in a digital context. Meanwhile, Hague and Payton (2019) define digital literacy as the ability to participate in a digital society by utilizing technology for learning, work, and social participation. In recent decades, digital literacy has evolved into a multidimensional concept that encompasses not only technical skills but also cognitive, social, and ethical aspects. UNESCO states that digital literacy is the ability to use digital devices, communication applications, and networks to access and manage information effectively.

Constructivist learning theory views knowledge as not simply transferred from teachers to students but actively constructed through learning experiences, social interactions, and reflection on the information acquired. This concept was put forward by figures such as Jean Piaget, who emphasized the process of knowledge construction through individual cognitive development, and Lev Vygotsky, who highlighted the importance of social interaction in the learning process. In the context of integrating digital literacy into Islamic Religious Education (PAI) learning in the Society 5.0 era, a constructivist approach enables students to utilize digital technology to critically explore Islamic sources, engage in collaborative discussions, and build contextual and contemporary religious understanding. Through a field study at SMKN 3 Cilegon City, the application of digital literacy in Islamic Religious Education (PAI) learning can be a means for students to not only receive religious information, but also process, evaluate, and construct the meaning of Islamic teachings independently through various digital media, thereby improving the quality of the learning process and outcomes

amidst the challenges of education in the digital era.

Digital literacy also encompasses the ability to read and write in a digital context, an understanding of cybersecurity, and online collaboration skills. The digitalization of education is a comprehensive transformation that integrates digital technology into the teaching and learning process, school management, and interactions between educational actors (Khan et al., 2022). Digitalization extends beyond administrative aspects to pedagogical ones, such as the use of Learning Management Systems (LMS), multimedia-based learning, and the use of digital data for learning outcome analysis (Churiyah et al., 2022).

Meanwhile, the Society 5.0 era prioritizes the use of technology to support creativity, collaboration, and humanity. In education, Society 5.0 demands critical, adaptive, and creative skills in the digital space. Students must be able to develop digital literacy that enables them to compete globally. The relationship between digital literacy, the digitalization of education, and Society 5.0 demonstrates that digital literacy is an indispensable competency in the development of future education. Without it, technology will simply become a new burden for schools, not a driver of innovation.

METHOD

This research employs a qualitative approach using a case study method, which is more in-depth because it is based on direct data collection and the participants are individuals who directly experience the social context of the research object (Waruwu, 2023). Data were collected through observation, documentation, and in-depth interviews with students at SMKN 3 Cilegon City. These interviews aimed to determine the extent of teachers' efforts and roles in implementing digital literacy in the learning process. Documentation was taken in the form of videos and photos with informants. Data obtained from the interviews were then analyzed based on the theory of digital literacy in student learning in the era of Society 5.0. The data sources in this study consist of primary and secondary data. The study population included all 27 study groups. Based on this population, a sample of 15%, consisting of four study groups, was taken. Primary data was obtained from these four study groups, which comprPAId grade XI.

Data analysis in this study used the interactive analysis model proposed by Matthew B. Miles, A. Michael Huberman, and Johnny Saldaña. This analysis model includes three main stages: data reduction, data presentation, and conclusion drawing and verification. Data reduction was carried out by selecting, focusing, simplifying, and organizing data obtained from observations, interviews, and documentation to align with the research focus. Next, the reduced data is presented systematically in the form of descriptive descriptions, tables, or charts, making it easier for researchers to understand patterns and relationships between data. The final stage is drawing conclusions and verifying them, which is the process of interpreting the meaning of the data and ensuring the validity of the research findings by double-checking the data obtained. This data analysis process is carried out continuously throughout the research until the data obtained is deemed saturated and able to provide a clear picture of the phenomenon being studied.

The data sources in this study consisted of primary and secondary data. Primary data were obtained from 14 informants: one principal, one vice principal, three teaching staff, and nine students. The informants were selected based on certain criteria: (1) the principal, who has the authority to formulate and implement Islamic boarding school education policies; (2) the vice principal, who oversees the curriculum and student affairs; and the field coordinator, who handles learning activities and coordinates matters related to students; (3) two teachers selected to explain the implementation of values-based learning at SMKN 3 Kota

Cilegon; and (4) ten randomly selected students. Meanwhile, secondary data were obtained from various supporting sources, such as written documents, archives, recordings, images, and other sources relevant to the research focus to strengthen and complement the primary data.

This study employed several data collection techniques, including non-participant observation, unstructured interviews, and documentation. Non-participant observation was conducted to obtain a factual picture of the phenomenon under study without directly involving the researcher in the activities of the research subjects. Unstructured interviews were used as the primary technique to gather in-depth and flexible information regarding the implementation of a spiritual environment and value-based learning in student character development at SMKN 3 Cilegon City. In-depth interviews lasted for 15–30 minutes for each informant, and were conducted 1–2 times per informant, depending on the need for in-depth data collection. Furthermore, documentation techniques were used as supporting data in the form of archives, notes, and documents relevant to the research focus. The validity of the data in this study was tested using triangulation techniques, both technical triangulation and source triangulation, to increase the validity and reliability of the data obtained.

RESULTS AND DISCUSSION

This research is related to the integration of digital literacy in Islamic religious education learning to improve the quality of learning in the era of society 5.0 at SMKN 3 Cilegon City, which can be explained by the researchers as follows.

According to Aam Musdalifah (Deputy Head of Curriculum, interviewed on February 2, 2026), the in-depth learning-based independent curriculum utilizes digital literacy integration in learning modules, a crucial strategy for adapting the educational process to the demands of the digital era. Learning modules are designed to not only contain teaching materials but also integrate the use of digital learning resources, project-based activities, and assignments that encourage critical, creative, and collaborative thinking skills. Furthermore, the curriculum emphasizes the use of digital platforms as flexible and interactive learning tools, while equipping students with information literacy and digital ethics skills. Thus, the use of digital literacy in learning modules is expected to improve the quality of learning and the relevance of student competencies to 21st-century needs.

Digital Literacy

Digital literacy plays a central role in the digitalization of education because it is the foundation of any learning process involving technology (Nguyen & Lan Anh Thuy, 2024). In a digital learning environment, students are required to understand how to find credible information, use digital platforms for collaboration, and create creative works that reflect their understanding of the subject matter. Therefore, digital literacy not only supports academic skills but also develops critical and creative thinking skills.

One of the functions of digital literacy in education is to increase the capacity of students in dealing with the flood of digital information (Nikou et al., 2022). Without adequate digital literacy, students will find it difficult to distinguish between valid and invalid information (Guo & Lee, 2023). In addition, digital literacy supports ethical aspects in the use of technology, such as an understanding of data privacy, digital security, and communication ethics in cyberspace.

Digitization of education without digital literacy can lead to technological dependence without critical understanding, resulting in only mechanical learning (Andriani et al., 2023). Thus, digital literacy must be placed in a strategic position as a core competency that is taught in a structured manner in schools and colleges.

Learning Quality

The quality of learning in the integration of digital literacy into Islamic Religious Education (PAI) in the Society 5.0 era refers to the effectiveness of the learning process in developing students' religious understanding and their ability to utilize digital technology critically, creatively, and responsibly. In the context of PAI learning at SMKN 3 Cilegon City, learning quality is measured not only by mastery of religious material, but also by students' ability to access, analyze, evaluate, and utilize digital information to deepen their understanding of Islamic values. The integration of digital literacy into learning enables a more interactive, contextual, and student-centered learning process, thereby increasing student engagement, motivation, and independence in learning.

Observations at SMKN 3 Cilegon City show that digital literacy has been integrated into various learning activities, such as the use of Google Classroom for distributing materials and assignments, the use of digital-based learning media (videos, interactive presentations, and online resources), and the implementation of technology-based projects that encourage students to search for, process, and present information independently. Furthermore, students are also involved in collaborative activities based on digital platforms that support communication and teamwork, while teachers act as facilitators who guide the critical and ethical use of technology. This implementation shows that digital literacy is not only used as a tool, but has become an integral part of the learning process to improve students' 21st-century skills.

According to Mr. Ahmad Nabil Farhan (a Grade X Islamic Religious Education teacher, interview, February 10, 2026), the use of digital literacy in the classroom has become an important part in supporting a more interactive and contextual learning process. Teachers utilize various digital platforms to deliver materials, give assignments, and conduct evaluations, so that learning becomes more flexible and easily accessible to students. In addition, teachers emphasize the importance of guiding students in using technology critically, ethically, and responsibly, especially in selecting information from bold sources. However, teachers also use learning references by instructing them to search on Google according to the discussion topic.

Learning Quality Indicators

Learning quality indicators in the integration of digital literacy can be seen from several main aspects. First, the learning planning aspect, namely the integration of digital literacy into learning tools such as objectives, materials, methods, and technology-based learning media. Second, the learning implementation aspect, characterized by the effective use of digital technology, the implementation of project-based learning, and the role of teachers as facilitators who guide students in utilizing digital learning resources. Third, student engagement and activity, reflected in their ability to seek information from various digital sources, collaborate on project-based assignments, and demonstrate critical and ethical attitudes in using technology. Fourth, learning outcomes, including increased understanding of Islamic concepts, digital literacy skills, and religious attitudes reflected in daily behavior. Therefore, integrating digital literacy into Islamic Religious Education (PAI) learning is a crucial strategy for improving learning quality, relevant to the demands of education in the Society 5.0 era.

Based on observations at the second meeting (February 4, 2026), learning quality indicators showed an increase in student activity, learning interactions, and achievement of learning objectives. Students appeared more involved in discussions, able to express opinions, and actively participate in task-based and project-based activities. In addition, the learning process was more varied through the use of diverse media and learning resources, thereby increasing student motivation and understanding of the material. From the teacher's perspective,

classroom management became more effective with a student-centered approach, as well as faster and more targeted feedback. Overall, learning quality indicators showed positive results, although improvements were still needed in the consistency of implementation and equalization of all student involvement.

Integrating Digital Literacy in Islamic Religious Education Learning

The integration of digital literacy into Islamic Religious Education (PAI) learning at SMKN 3 Cilegon City is one of the school's strategic efforts to meet the demands of education in the era of Society 5.0. Digital literacy is not only defined as the ability to use technological devices, but also as students' ability to access, understand, evaluate, and utilize digital information critically and responsibly. In the context of learning, digital literacy plays a crucial role in supporting the development of 21st-century competencies, such as critical thinking, creativity, communication, and collaboration (Arifin & Mu'id, 2024).

In teaching practice, teachers at SMKN 3 Cilegon City have integrated digital literacy through the use of various digital media and platforms. Teachers use tools such as digital presentations, instructional videos, and online learning platforms to deliver material. Furthermore, students are guided to seek out learning resources relevant to the subject matter online, ensuring that the learning process is not solely focused on textbooks but also on more diverse and up-to-date digital information sources.

The application of digital literacy is also evident through students' active involvement in assignment- and project-based learning activities. Students are trained to compile assignments in the form of digital presentations, online search-based reports, and group discussions using digital media. Through these activities, students not only learn to understand the material but also develop critical thinking skills in organizing information, collaborating with peers, and effectively conveying ideas using technology. However, the implementation of digital literacy at SMKN 3 Kota Cilegon still faces several challenges, such as differences in digital proficiency levels among students and limited technological facilities in certain situations. Nevertheless, the school and teachers continue to work to overcome these obstacles through guidance, gradual introduction to technology use, and instilling digital ethics. Thus, the implementation of digital literacy is expected to improve the quality of learning and equip students with relevant skills to face the changing times.

Previous research has shown that digital literacy plays a crucial role in enhancing the quality of Islamic Religious Education (PAI) learning in the Society 5.0 era. Research by Azhar 2024 explains that the use of digital technologies such as online learning platforms, interactive videos, and educational applications can increase student engagement and understanding of PAI material. The study also emphasized that technology integration makes learning more interactive and student-centered, thus making the learning process more contextual with the times. Furthermore, research on "Utilizing Digital Technology as a Medium for Islamic Religious Education Learning in Elementary Schools in the Society 5.0 Era" found that the use of digital media such as interactive e-books, learning videos, and educational applications can improve student motivation and learning outcomes, although its implementation still faces challenges such as limited infrastructure and teacher readiness (Awaliyah, 2025).

Unlike previous studies that generally used a literature review approach or emphasized the use of digital media as a learning tool, this article employs a more contextual approach through field studies. This research not only discusses the use of technology as a learning medium but also emphasizes the integration of digital literacy as a competency that students must possess in accessing, evaluating, and critically utilizing religious information in the digital environment. These findings align with

studies on the transformation of Islamic Religious Education (PAI) learning, which emphasize that the Society 5.0 era demands a shift in learning paradigms that combine Islamic values with the development of digital technology. Thus, this study provides a new contribution in the form of empirical evidence regarding the practice of integrating digital literacy in Islamic Religious Education (PAI) learning in vocational high schools.

Teachers' strategies for integrating digital literacy into Islamic Religious Education (IS) learning are implemented through the use of technology as part of an active and contextual learning design. Teachers begin by selecting relevant digital platforms and resources, such as instructional videos, e-books, and educational apps, then package these into activities that encourage students to explore, analyze, and critically reflect on Islamic values. Learning is also designed to be project-based and based on online discussions to foster collaboration and higher-order thinking skills. Furthermore, teachers act as facilitators, guiding students in the ethical and responsible use of technology, including in selecting valid information. This strategy is reinforced by digital-based evaluation that allows for rapid and continuous feedback, making the learning process more effective, interactive, and in line with the demands of the digital era.

Forms of Digital Literacy Implementation at SMKN 3 Cilegon City

Based on the results of interviews and observations with Amaliyah as a Class XI PAI teacher on February 10, 2026, it was confirmed that the Forms of Implementation of Digital Literacy at SMKN 3 Cilegon City were through: Technology Integration in Learning, Project-Based Learning, the Role of Teachers as Facilitators, Utilization of Technology to Personalize Learning.

Technology Integration in Learning

The integration of technology into learning is one concrete form of digital literacy implementation in schools. The use of digital technology aims to support the teaching and learning process, making it more effective, interactive, and tailored to the needs of students in the era of Society 5.0. In the context of learning, technology functions not only as a tool but also as a medium that can expand access to information and improve the quality of students' learning experiences (Safitri et al., 2025).

In practice, teachers integrate technology through the use of various digital learning platforms and media. Learning Management Systems (LMS) such as Google Classroom and Moodle are used to manage learning materials, collect assignments, and facilitate communication between teachers and students. Furthermore, digital learning media such as interactive videos, e-modules, and digital presentations are used to help students understand the material more easily. The use of online quizzes and evaluation applications is also an efficient assessment alternative, as it can provide fast and accurate results.

Through the integration of technology into learning, students are encouraged to be more active and independent in the learning process. Students become accustomed to accessing learning resources, completing assignments online, and participating in technology-based discussions. This not only increases learning motivation but also develops students' digital literacy skills, such as the ability to process information, think critically, and use technology wPAIly and responsibly (Habibi et al., 2025).

Interviews with a representative of a Grade XII student named Zaky (February 10, 2026) showed that the implementation of technology-based Islamic Religious Education learning was felt to be very helpful in the learning process. Students stated that the use of learning videos, interactive presentations, and online platforms made it easier for them to

understand material that was previously considered difficult, because it could be accessed again at any time as needed. In addition, features such as online quizzes and digital discussions helped them be more active and quickly determine their level of understanding of the material. Students also expressed that learning became more interesting and less monotonous, thus increasing learning motivation. Thus, the use of technology in Islamic Religious Education learning is considered to be able to provide convenience, flexibility, and a more effective learning experience for students.

Project-Based Learning

Project-based learning is an effective learning strategy that supports literacy implementation. Through this learning model, students are actively engaged in the learning process by working on projects that require the use of digital technology. Project-based learning provides students with opportunities for contextual learning, connecting subject matter to real-world problems, and developing 21st-century skills relevant to the demands of Society 5.0 (Brahmandika & Sutama, 2024).

In its implementation, teachers design learning projects that encourage students to use a variety of digital media and sources. Students are tasked with creating learning products such as educational videos, digital presentations, articles, or infographics based on online research. These projects require students to search for information from various digital sources, process the data, and present the results creatively. Thus, students not only understand the subject matter but also develop critical thinking, collaboration, and communication skills using technology.

Through project-based learning, students also learn to take responsibility for their own learning processes and outcomes. Students are trained to manage their time, work collaboratively in groups, and use technology effectively and ethically. The teacher's role in this learning is more of a facilitator, providing direction, guidance, and feedback throughout the project process. By implementing Project-Based Learning, learning becomes more meaningful, participatory, and can continuously improve students' digital literacy skills (Resti et al., 2024).

The Teacher's Role as a Facilitator

In implementing digital literacy in the learning process, teachers play a crucial role as facilitators, guiding and directing students in optimally utilizing technology (Ikhlas & Suyanta, 2024). In the era of Society 5.0, the role of teachers is no longer merely as a transmitter of material, but also as a learning companion, helping students develop critical, creative, and independent thinking skills. Teachers play a crucial role in creating a conducive and interactive learning environment and encouraging students to actively participate in digital-based learning activities.

As facilitators, teachers provide direction and guidance regarding the use of digital technology in learning. Teachers help students understand how to access relevant learning resources, utilize digital learning media, and effectively use online learning platforms. Furthermore, teachers guide students in selecting valid and responsible information, so that students are not only technically skilled but also critically and ethically skilled in using technology.

The teacher's role as facilitator is also reflected in efforts to encourage discussion and reflection on digital-based learning. Teachers create discussion spaces through engaging online forums that involve collaborative technology that allows students to exchange ideas and opinions. Furthermore, teachers provide ongoing feedback on student learning outcomes, both through digital comments and online evaluations. Thus, the teacher's role as a facilitator can support a more meaningful learning process and continuously improve students' digital literacy skills (Sihombing et al., 2024).

Utilizing Technology to Personalize Learning

Utilizing technology to personalize learning is a crucial strategy for implementing digital literacy in the era of Society 5.0. Personalized learning aims to tailor the learning process to the interests, abilities, and needs of each student (Ritonga et al., 2024). With digital technology, teachers can design more flexible and student-centered learning, ensuring that each student receives a learning experience tailored to their potential.

In teaching practice, teachers utilize digital technology to identify students' abilities and learning progress. Online learning platforms and evaluation applications are used to continuously monitor student learning outcomes (Wati et al., 2026). Data obtained from digital learning activities helps teachers provide enrichment materials for students who have achieved competency, as well as additional guidance for students who are still experiencing difficulties.

Thus, technology plays a supporting role in making more informed learning decisions. Furthermore, the use of technology allows teachers to provide rapid and ongoing feedback to students. Through digital comments, messages on learning platforms, or online evaluation results, students can immediately identify their learning achievements and shortcomings. This personalized feedback helps students improve their understanding and increases their motivation to learn. By implementing technology-based personalized learning, the learning process becomes more effective, adaptive, and optimally supports the development of students' digital literacy.

Challenges of Digital Literacy in the World of Education

A comprehensive strategy to strengthen digital literacy as the primary foundation of digital education. This strategy emphasizes the integration of digital literacy into the curriculum as a crucial core competency, as well as the need to enrich learning materials with relevant digital resources so that students can develop digital skills holistically and integrated across various learning contexts.

The primary objective of this strategy is to equip students with the skills and knowledge necessary to participate actively and effectively in the digital age. Four key, interrelated elements play a crucial role in the implementation of this strategy (Dewi, 2024). First, a relevant and adaptive curriculum that includes structured core competencies of digital literacy. Second, competent educators trained in digital pedagogy, enabling them to effectively integrate technology into the learning process. Third, a supportive school ecosystem with adequate digital infrastructure, such as a Learning Management System (LMS) and an integrated digital library. Fourth, close collaboration between government, industry, and the community to provide equitable access to digital tools and resources, and to promote a healthy and responsible digital culture. With the synergy between these four elements, it is hoped that the implementation of the digital literacy strategy will run optimally and have a positive impact on improving the quality of education.

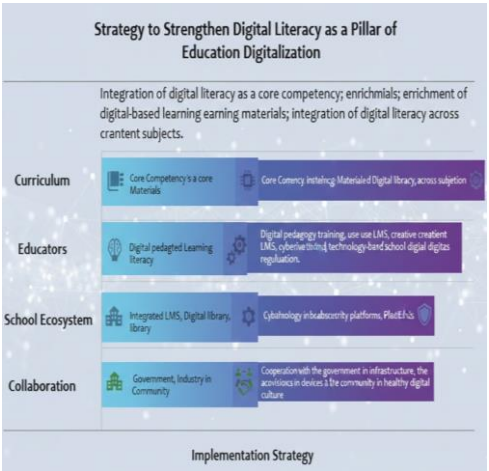

Figure 1. Strategy to Strengthen Digital Literacy as a Pillar of Education Digitalizatation

Various education studies and reports have identified several key challenges in

strengthening digital literacy in Indonesia (Tinmaz et al., 2023). These challenges include infrastructure, teacher readiness, curriculum, digital culture, and regional disparities. To provide a more comprehensive picture, the following table analyzes digital literacy challenges based on general findings in schools and universities (Peng, Danhua, 2022). This was also confirmed by Ahmad Nabil (interview, February 10, 2026) that behind the ease of digital learning, there are also challenges faced by teachers, as illustrated in the following table:

Table 1. The Challenge of Strengthening Digital Literacy in the Education Environment

Aspects	Challenge Description
Infrastructure	Inequality of internet access, uneven devices, high costs, and lack of technical support.
Teacher Competence	Mastery of digital pedagogy is not evenly distributed; still focusing on technical abilities without integration in learning.
Curriculum	Digital literacy has not yet become a core competency across subjects; are still considered additional skills.
Digital Culture	The use of technology has not been followed by an understanding of digital ethics; the rPAI of plagiarism, cyberbullying, and unproductive use of devices.
Territorial Gap	The difference in the quality of digital literacy between urban and rural schools is still very significant.
Information Literacy	The low ability to evaluate digital information sources makes students vulnerable to disinformation.

Strategy to Strengthen Digital Literacy as a Pillar of Digitalization of Education

Strengthening digital literacy must be done through a systematic approach involving various stakeholders. This strategy includes curriculum transformation, teacher competency development, strengthening the school's digital ecosystem, and multi-stakeholder collaboration (Alali & Wardat, 2024). Strengthening digital literacy cannot be done partially, but must be a sustainable educational culture project (Tinmaz et al., 2022).

Therefore, Ahmad Nabil provides a solution to face the challenges of digital literacy as described in the following table:

Table 2. Strategy to Strengthen Digital Literacy as a Pillar of Education Digitalization

Dimension	Implementation Strategy
Curriculum	Integration of digital literacy as a core competency; enrichment of digital-based learning materials; integration of digital literacy across subjects.
Educators	Digital pedagogy training, data literacy, use of LMS, creative content creation, and technology-based learning evaluation.
School Ecosystem	Provision of an integrated LMS, digital library, cybersecurity policy, use of collaborative platforms, and school digital ethics regulations.
Collaboration	Cooperation with the government in infrastructure, the technology industry in the provision of devices, academics in digital research, and the community in habituating a healthy digital culture.

CONCLUSION

The conclusion of this study confirms that digital literacy is the main foundation in the digitalization of education in the era of Society 5.0, which includes not only technical skills, but also the ability to think critically, ethically, and creatively in the use of technology. The integration of digital literacy in Islamic Religious Education learning at SMKN 3 Cilegon City has been proven to improve the quality of learning through the application of technology, project-based learning, the role of teachers as facilitators, and personalized learning, thereby encouraging student activeness, collaboration, and critical thinking skills. However, its implementation still faces challenges that require a comprehensive strategy in the form of developing an adaptive curriculum, improving the

pedagogical competence of digital teachers, strengthening infrastructure such as LMS and digital libraries, and multi-stakeholder collaboration. Thus, this study provides a practical contribution as a digital literacy integration model that can be used as a reference for educators and policymakers in improving the quality of technology-based learning.

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