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DIGITAL LITERACY IN ISLAMIC ELEMENTARY SCHOOL: AN OVERVIEW OF THE FACTORS, CHALLENGES, AND IMPACT 21ST CENTURY SKILLS DEVELOPMENT

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Abstrak

Kajian ini bertujuan untuk mengeksplorasi faktor-faktor kunci, tantangan, dan dampak implementasi literasi digital di sekolah dasar Islam, khususnya mengenai pengembangan keterampilan abad ke-21. Dengan menggunakan Tinjauan Literatur Sistematis (SLR) yang dipandu oleh protokol PRISMA, total 41 artikel relevan dari database Scopus (2015–2024) dianalisis. Temuan tersebut mengungkapkan bahwa literasi digital di Madrasah Ibtidaiyah dipengaruhi oleh beberapa elemen yang saling terkait, antara lain infrastruktur teknologi, kebijakan pemerintah, kompetensi guru, dan peran orang tua. Studi ini juga mengidentifikasi tantangan signifikan, seperti akses terbatas ke teknologi, kesiapan guru yang tidak merata, dan resistensi sosial-budaya, terutama di daerah pedesaan dan kekurangan sumber daya. Terlepas dari hambatan tersebut, penerapan literasi digital telah menunjukkan dampak positif terhadap kemampuan siswa dalam berpikir kritis, kolaborasi, pemecahan masalah, dan komunikasi digital, ketika dibingkai dalam nilai-nilai pendidikan Islam. Hasil ini menggarisbawahi perlunya pendekatan literasi digital yang integratif dan berbasis agama untuk mendukung kompetensi teknologi dan pengembangan moral dalam pendidikan dasar Islam.

***Kata kunci**: Nilai-nilai Islam, Literasi Digital Islam, Kurikulum Pendidikan Islam, Integrasi Teknologi dalam Pendidikan Islam, Digitalisasi Madrasah.*

Abstract

This study aims to explore the key factors, challenges, and impacts of digital literacy implementation in Islamic elementary schools, particularly regarding the development of 21st-century skills. Employing a Systematic Literature Review (SLR) guided by the PRISMA protocol, a total of 41 relevant articles from the Scopus database (2015–2024) were analyzed. The findings reveal that digital literacy in Madrasah Ibtidaiyah is influenced by several interconnected elements, including technological infrastructure, government policies, teacher competence, and parental roles. The study also identifies significant challenges, such as limited access to technology, uneven teacher preparedness, and socio-cultural resistance, especially in rural and under-resourced areas. Despite these barriers, the implementation of digital literacy has shown a positive impact on students' abilities in critical thinking, collaboration, problem-solving, and digital communication, when framed within Islamic educational values. These results underscore the need for integrative and faith-based approaches to digital literacy in order to support both technological competency and moral development in Islamic primary education.

Keywords: Islamic Values, Islamic Digital Literacy, Islamic Education Curriculum, Integration of Technology in Islamic Education, Digitalization of Madrasahs.

INTRODUCTION

The rapid advancement of digital technology in the 21st century has significantly transformed various sectors (Redhana *et al.*, 2022), including Islamic primary education (Utaminingsih *et al.*, 2023). Islamic Elementary Schools, as a formal institution within the Islamic education system, is increasingly impacted by digitalization, particularly in its efforts to equip students with essential 21st-century skills such as critical thinking, collaboration, creativity, and communication (Dilekçi and Karatay, 2023). In this context, digital literacy is not merely seen as the ability to operate technological tools but also as a medium for instilling Islamic values through adaptive and contextually relevant learning approaches (Mathebula, 2024) (Turiman, Wook and Osman, 2019).

The integration of digital literacy in Islamic elementary schools has become increasingly urgent in response to the demands of globalization and educational transformation (Shelton and Altwerger, 2014). The use of digital technology in learning allows students to access Islamic knowledge more broadly and deeply (Feng and Sumettikoon, 2024), while simultaneously training them to evaluate and filter information wisely in line with Islamic teachings (Olive *et al.*, 2021). However, implementing digital literacy within the Islamic education framework remains challenging, especially due to unequal access to infrastructure, varying levels of teacher competence, and limited digital awareness among parents (Bahri *et al.*, 2024).

Digital literacy in the context of Islamic elementary schools must also take into account the cultural and religious characteristics of the students (Palalas and Wark, 2020), (Quaicoe and Pata, 2018). A holistic approach needs to be developed so that technological proficiency does not distance students from Islamic values, but rather serves as a means to strengthen their understanding and practice of religion (Munyengabe *et al.*, 2017). Therefore, studies on digital literacy in Madrasah Ibtidaiyah should include an analysis of the supporting factors, challenges, and their impact on the development of 21st-century skills rooted in Islamic values (Kong *et al.*, 2017).

Many madrasahs still face major limitations in accessing digital tools and reliable internet connectivity (Turiman et al, 2019), (Carroll *et al.*, 2023). Moreover, not all teachers are equipped with the necessary pedagogical and digital competencies to integrate technology meaningfully into Islamic learning (Rifai *et al.*, 2021). This is particularly critical since teachers play a central role in transforming digital education into a tool that is not only informative but also ethical and spiritual (Mathebula, 2024). While prior research has explored digital literacy in general elementary school settings, most studies focus on technical, pedagogical, or infrastructural issues in secular contexts (Kocaarslan and Yamaç, 2024). There remains a significant gap in the literature regarding how digital literacy can be effectively integrated within Islamic elementary schools,

particularly in a way that aligns with Islamic values and addresses the contextual needs of Muslim learners. Furthermore, the relationship between digital literacy and the development of 21st-century skills within the framework of Islamic education has been largely underexplored.

Therefore, this study aims to address this research gap through a systematic literature review that analyzes the factors, challenges, and impacts of digital literacy implementation in Islamic Elementary Schools. This review not only examines how digital tools support the learning process but also how they can be leveraged to enhance 21st-century skills while upholding the spiritual and moral foundations of Islamic education. The findings are expected to contribute to the development of evidence-based strategies and policies for digital literacy that are both technologically adaptive and rooted in Islamic values.

METHODS

The method in this article uses a Systematic Literature Review (SLR) conducted to enable a reliable assessment to filter out empirical evidence that answers the purpose of writing this article. The procedure used is PRISMA (Liberati *et al.*, 2009)which will be explained in Figure 1. The search criteria are set based on research questions to determine which articles to include or exclude from the analysis. The database used in this study is a database from Scopus. This study uses search keywords ("Digital Literacy" OR "Technology Skills" OR "e-learning" OR "Digital Learning") AND ("Islamic Primary Education" OR "Islamic Elementary Schools" OR “Madrasah Ibtidaiyah”). Literature eligibility is tied to those published in English from 2015 to 2024.

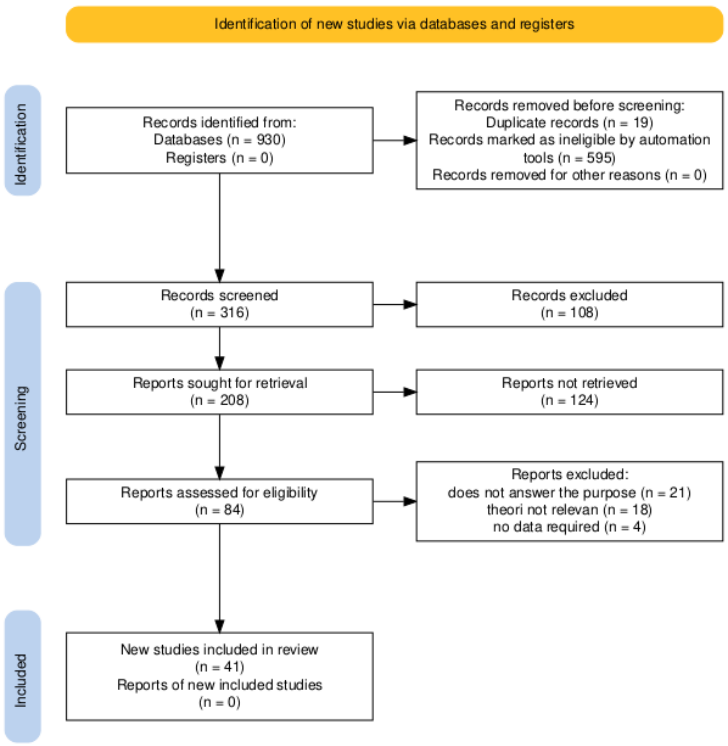

Figure 1. SLR Stage Flow Diagram (Haddaway *et al.*, 2022)

From the search on the database from Scopus, 930 articles in titles, abstracts, and keywords were produced. The collected articles were checked and deduplicated to 19 articles. A total of 595 articles without full text were also excluded. The full text of 316 was excluded as many as 108 because it did not match the title, and the report was not taken by 124 because the research was not in elementary school. The collected articles are further examined and assessed for eligibility based on the eligibility criteria as shown in Table 1. Literature that did not meet the eligibility criteria was excluded and resulting in 41 articles being used for further analysis. Literature is read, coded, and checked for consistency. Each publication is further categorized based on methodology and the country in which the first author's institution is located. The research methodology includes qualitative, quantitative, and mixed methods of research. The collected articles are synthesized to answer the purpose of the literature review.

Table 1. Article includes and excludes criteria

Article Inclusion Criteria	Article Exclusion Criteria
The article answers one of the purposes	Articles that don't answer the purpose
The article provides theories that support the literature review	The theory in the article is not appropriate
The article explains the data needed	The article does not explain the data required

This article also uses bibliometric analysis which is used to measure and analyze various characteristics of research articles taken by utilizing statistical

techniques and quantitative data to identify patterns and trends in the research literature, including linkages between topics, authors, institutions, countries, as well as citation patterns and scientific collaborations. This analysis aims to provide a more comprehensive picture of the development of a field of science, research productivity, and the influence of certain scientists or institutions. This review literature also uses the help of the VOSviewer application, utilizing the co-occurrence feature to examine relationships and analyze the interconnections between keywords in the article pool.

RESULTS AND DISCUSSION

Descriptive Statistics from Relevant Literature

From the results of the analysis of 41 articles that have met the eligibility criteria, statistical data on the year of publication of the article, the research method used in the article reviewed, and the distribution of articles collected by the researcher's country, along with bibliometric analysis.

Based on 41 articles reviewed from 2015 to 2024, there are significant fluctuations in the publication of the reviewed articles. At the beginning of the period, 2015 to 2016, the number of articles published was relatively low with a consistent number. The year 2017 showed a sharp spike in publications, signaling an increase in attention to the research topics under review. However, after that there was a decline in the following years until 2020.

Starting in 2021, although there was a slight increase, the trend remained relatively stagnant. What is striking is the drastic spike in 2024, with the number of articles published reaching 18 articles, being the year with the highest number of publications throughout the period reviewed. Overall, the distribution of publications shows the dynamics of research trends with an increasing focus in the years approaching 2024. A total of 41 articles reviewed in this study indicate that this field has experienced rapid growth in recent years.

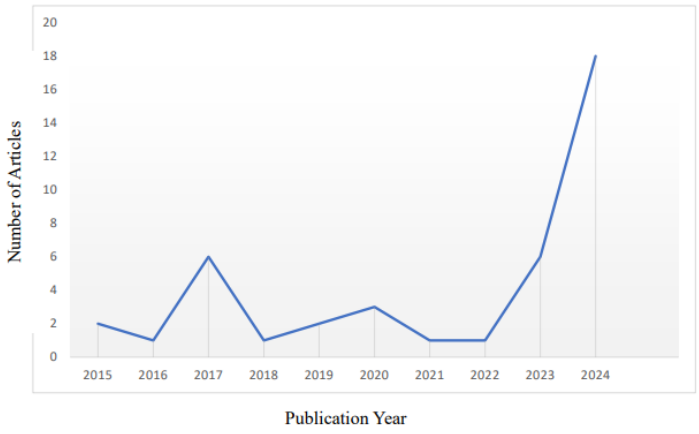

Figure 2. Diagram of the Year of Publication of The Relevant Literature

The distribution of research methods from 41 reviewed articles shows a fairly clear preference for certain methods. A total of 18 articles used quantitative methods, demonstrating the dominance of numerical data-based approaches and statistical analysis in related studies. The same number, i.e. 18 articles, also used qualitative methods, reflecting a significant interest in an in-depth exploration approach to the phenomenon or subject being studied.

Meanwhile, the mixed method, which combines quantitative and qualitative aspects, is only used in 5 articles. This shows that although the mixed method provides an advantage in obtaining more comprehensive insights, its use is still relatively limited compared to other methods. This distribution reflects a strong tendency to choose more specific approaches (both quantitative and qualitative) in the studies reviewed, although the synergistic potential of mixed methods remains recognized.

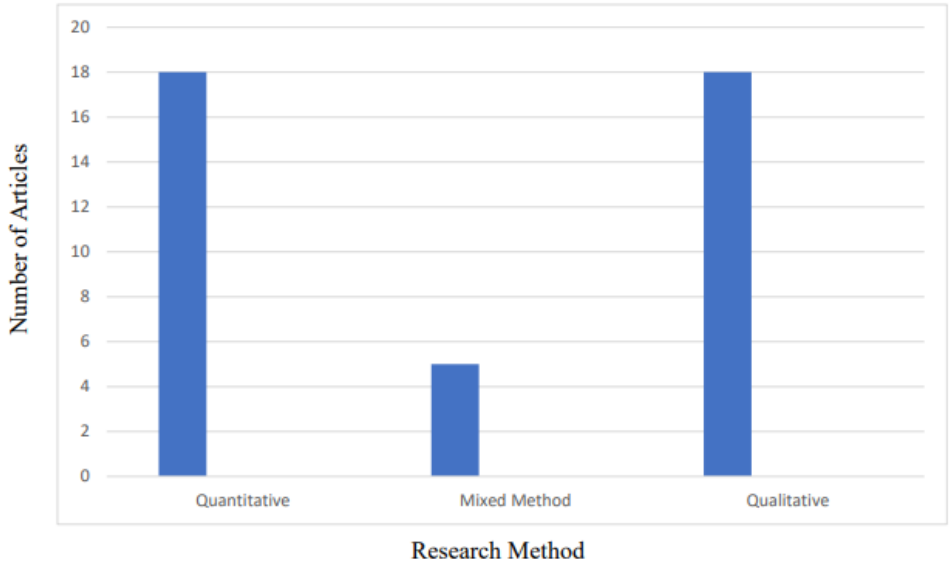

Figure 3. Diagram of Relevant Literature Research Methods

The distribution of the researchers' country of origin from the 41 articles reviewed shows that Indonesia dominates, with a total of 9 articles contributing. Followed by Spain with 6 articles and the United States with 4 articles. Furthermore, contributions from China, the Netherlands, and the United Kingdom are 3 articles each. Countries such as Finland and Kenya contributed 2 articles each, while Ghana, Canada, Egypt, South Korea, Slovakia, Brazil, Taiwan, Thailand, Rwanda, Kuwait, Serbia, and South Africa contributed 1 article each. This data reflects the geographical diversity of the research, with significant contributions from Asian, European, and North American countries. Indonesia's dominance as the country with the largest number of publications shows high interest in digital literacy.

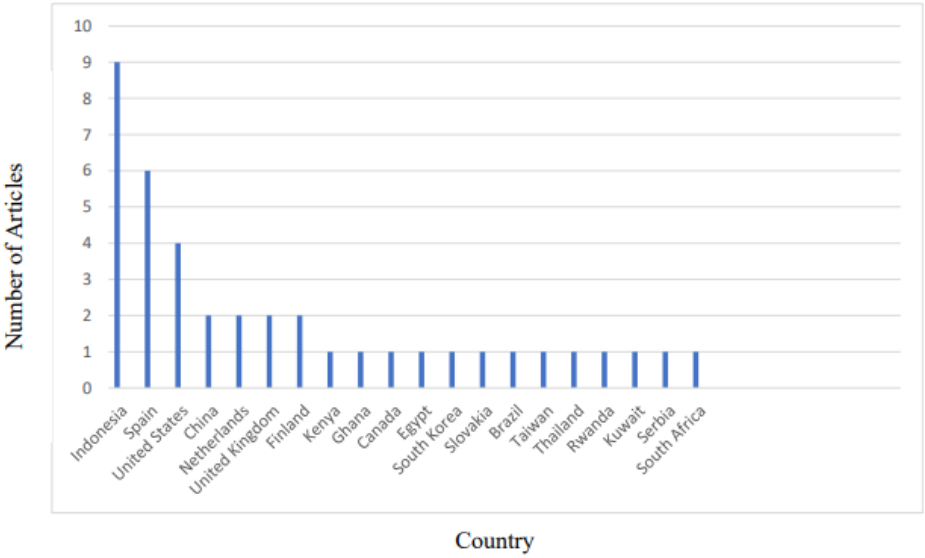

Figure 4. A Diagram of the Relevant Literature Research Country

Some of the factors that emerged include digital competence, educational technology, critical digital literacy, and computational thinking. This shows the importance of technological competence and critical thinking skills in the development of digital literacy, which is relevant to the goal of building 21st century skills. Topics such as covid-19, distance learning, and disasters show that global conditions, such as pandemics and disasters, are significant challenges in the implementation of digital literacy in primary schools. This is relevant to understand the barriers in the integration of digital literacy into learning. Elementary school nodes are connected to the role of parents, instructional leadership, and distance learning. This shows that the role of parents and educational leadership is an important factor in the success of digital learning in elementary schools.

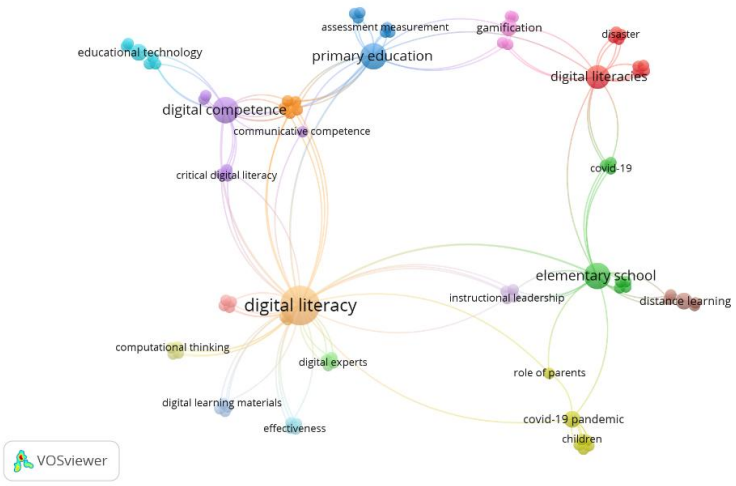

Figure 5. Bibliometric Visualization from VOSviewer

Based on the bibliometric visualization from VOSviewer related to the theme of digital literacy in Islamic elementary schools, there are several groups of topics that stand out and are relevant to the purpose of this article. Digital Literacy as a Research Center. The term digital literacy is a major node with close relationships to various other topics, suggesting that this theme is at the core of the literature being analyzed. It emphasizes the relevance of digital literacy as a key element in the development of 21st century skills in primary education.

Topics such as gamification, assessment measurement, and effectiveness show that innovative strategies in digital learning, such as gamification and technology-based assessment, have the potential to improve learning effectiveness and support 21st-century skills development. This visualization indicates a strong relationship between digital literacy and 21st century skill development through various supporting factors and existing challenges. Your article can explore more deeply the contribution of each of these elements to the design, implementation, and evaluation of digital literacy in primary schools.

Analysis of factors affecting digital literacy

Technology infrastructure is a fundamental element that affects digital literacy in primary schools (Carroll *et al.*, 2023). This infrastructure includes access to digital devices such as computers, tablets, and projectors, as well as an adequate internet network (Zhang and Zhu, 2016). In developed countries, better technological infrastructure has been shown to increase students' access to digital learning, allowing them to take advantage of a variety of online educational resources (Pöntinen and Räty-Záborszky, 2020). A study by (Slindile Mathebula, 2024) shows that accessibility to technological infrastructure is positively correlated with the improvement of students' digital skills, especially in information abilities and collaborative skills. However, in many developing countries, infrastructure limitations are often a major obstacle. Schools in rural or remote areas often lack adequate technological devices or internet networks, which limits students' opportunities to engage in digital learning optimally (Arwin, 2024). This limitation creates a digital divide between students in schools who have full access to technology and those who do not (Ciampa, 2017). As a result, digital literacy skills are developing unevenly, so the government and schools need to devise solutions to ensure that every student has equal opportunities (Moreno-Morilla, Guzmán-Simón and García-Jiménez, 2021).

Government policies have a key role in determining the direction and quality of digital literacy in primary schools (Pöntinen and Räty-Záborszky, 2020). In countries with supportive policies, such as specific funding programs for educational technology, the provision of free internet, and the implementation of digital literacy curricula, students can benefit greatly from this structural support (Kong *et al.*, 2017). In Indonesia, there is already a school digitalization initiative program, although its implementation still faces logistical challenges and budget

limitations (Mulya, Putra and Hermita, 2023). In the context of developing countries, budget constraints and lack of priorities in digital literacy policies cause obstacles in ensuring that programs run evenly (Pérez-Escoda and Rodríguez-Conde, 2015). The government has paid more attention to digital literacy through policies, such as periodic training and digital device assistance for primary schools (Kong *et al.*, 2017), indirectly narrowing the digital divide and opening up wider access for students to develop digital skills (Munyengabe *et al.*, 2017).

Parents play a significant role in developing children's digital literacy, especially since they are the primary supervisors in the use of technology at home (Zhang and Zhu, 2016). Parents' attitudes and understanding of the importance of digital literacy greatly affect how far children can go to explore the digital world in a productive and safe way (Souza, 2024). Research by (Mohammed, 2024) shows that children whose parents actively guide in the use of the internet and digital resources tend to have better digital skills and a deeper understanding of digital ethics. Conversely, when parents lack understanding or worry about the potential negative impact of technology, they tend to limit children's access to digital devices, which can hinder the development of children's digital literacy. The role of parents also includes providing access to educational applications, control over content, and supervision over screen time (Stošić, Stošić and Janković, 2024). Therefore, digital literacy programs that involve training for parents will help improve children's digital skills more effectively, especially at the primary school level where parental supervision is still indispensable (Sari et al., 2022).

Teachers play a key role in the development of students' digital literacy (Jung, Choi and Fanguy, 2024), so the availability of training for them is very important. This training aims to improve teachers' understanding of technology and skills in integrating digital devices into the learning process (Del-Moral-Pérez, Villalustre-Martínez and Neira-Piñeiro, 2019). In many developed countries, digital literacy training for teachers has become a priority and required in the training curriculum of educators, so that they are better prepared to face the challenges of technology-based teaching (Shyshak *et al.*, 2024). Research by (Munyengabe *et al.*, 2017) demonstrate that teachers trained in digital literacy can help students better understand basic digital concepts, increase student engagement, and encourage collaboration through digital learning platforms. However, in developing countries, training for teachers is often limited due to cost, time, and availability of competent trainers (Hagerman and Neisary, 2024). The absence of this training causes many teachers to feel less confident in using technology, so they are reluctant to integrate digital devices in learning activities (Marmoah, 2024). As a result, students lose the opportunity to develop digital literacy skills in school (Fundi *et al.*, 2024). Improving periodic, accessible, and sustainable training programs for

elementary school teachers is urgently needed to facilitate a learning process that is in accordance with this digital era (Andayani, Meter and Setiawan, 2023).

Although the factors supporting digital literacy are similar between developed and developing countries, there are fundamental differences in infrastructure availability, policy support, and teacher and parent readiness (Zhang and Zhu, 2016). In developed countries, strong policy support, adequate infrastructure, and more abundant resources contribute positively to digital literacy in primary schools (Al-Awidi, H; Aldhafeeri, 2017). Meanwhile, in developing countries, the main challenges in the form of limited resources, low teacher training, and socio-cultural barriers hinder the development of digital literacy evenly (Munyengabe *et al.*, 2017). Here is a table of critical analysis of the factors influencing digital literacy in primary schools based on comparisons between other and developing countries:

Table 2. Factors Affecting Digital Literacy in Developed and Developing Countries

No	Factor	Developed Countries	Developing Countries
1	Technology Infrastructure	Good technological infrastructure, including fast internet access, computer devices, tablets, and school networks. The government provides budget and technology support for schools.	Limited infrastructure, especially in rural areas; Internet access is uneven, and many schools lack devices. Budget constraints often hinder the procurement of technological devices.
2	Government Policy	An education policy that supports digital literacy and the integration of technology in the curriculum as a whole. There are national programs, such as digital literacy curriculum and technology training for teachers.	Policies tend to be still in the early stages or inconsistent in supporting digital literacy as a whole. Policy support and training programs are still limited and depend on location and limited budget allocation.
3	Teacher Competence	Teachers generally have higher technological skills due to continuous and structured training. Regular professional development programs facilitate teachers' adaptation to new technologies.	Many teachers lack technological competence due to limited training, especially in rural areas. The lack of special training for teachers hinders their ability to integrate technology in learning.
4	The Role of Parents	Parents generally support digital literacy and are more informed about the benefits of technology for children's education. Many parents are actively involved in guiding the use of technology at home.	Most parents have a limited understanding of digital literacy, especially in regions with low access to technology. Some parents are concerned that exposure to technology can negatively impact children's cultural values or habits.

No	Factor	Developed Countries	Developing Countries
5	Support Resources	Easy access to educational software, learning platforms, and digital resources. Many digital resources are available for free or subsidized by the government or educational institutions.	Limited access to quality digital resources, as well as a lack of technology-based learning materials in many schools. Schools are limited in providing digital resources due to cost constraints and low budgets for technology procurement.

These supporting and inhibiting factors for digital literacy are interrelated and require a comprehensive approach. Adequate infrastructure must be supported by policies oriented towards equitable access to technology, and the success of its implementation also depends heavily on parental involvement and teacher readiness through adequate training. Challenges and opportunities in these factors must be addressed with a collaborative approach between governments, schools, and families to ensure that digital literacy becomes a basic skill that is equally accessible to all primary school students, so that they are prepared for the demands of the digital world of the future.

Analysis of challenges in the implementation of digital literacy

In the implementation of digital literacy in primary schools, including infrastructure constraints, lack of teacher competence in technology, and socio-cultural barriers that may affect the adoption of digital literacy (Carroll *et al.*, 2023). Adequate technological infrastructure is an important foundation for the implementation of digital literacy in primary schools (Usman *et al.*, 2024). In many regions, especially in developing countries, the absence of decent infrastructure is a major obstacle (Fernández-Montalvo *et al.*, 2017). Many elementary schools in remote areas or with limited budgets do not have digital devices such as computers, tablets, or stable internet access (Melva Zainil, 2024). Research by Akhyar et al., (2021) shows that the lack of access to adequate technology infrastructure limits students' learning experience with technology, as well as leaving them behind in mastering digital skills that are crucial for the 21st century.

In some developing countries, schools may have limited computer or tablet devices, but due to limited internet networks, these devices cannot be used optimally in the learning process (Castañeda and Villar-Onrubia, 2023). These infrastructure constraints are often exacerbated by imbalances in government budget allocations, where urban areas tend to receive greater support than rural areas (Quaicoe and Pata, 2018). To overcome this challenge, continuous support from the government in the form of technology subsidy programs or investments in the development of digital infrastructure in underdeveloped areas is urgently needed so that students in all locations can access educational technology equally (Masyhura and Ramadan, 2021).

Teachers have a crucial role in facilitating students' digital literacy, but the lack of technological competence among elementary school teachers is a major challenge in the implementation of digital literacy (Hungerford-Kresser, Amaro-Jiménez and Pole, 2023). Many teachers do not have sufficient knowledge or skills in the use of digital devices, especially in underdeveloped areas or where technology training programs for teachers are still limited. According to a study by (Al-Awidi, H; Aldhafeeri, 2017), teachers who do not have an adequate understanding of the use of technology in teaching tend to be hesitant to apply it in the classroom. They may feel worried about technical difficulties or worried about their ability to control technology-based learning (Zainil *et al.*, 2024).

In addition, the lack of relevant training and support from schools also exacerbates this problem, causing teachers to be unprepared to utilize technology as a learning tool (Polizzi, 2020). To address these challenges, there needs to be a continuous, tailor-made training program at the primary school level, as well as adequate technical support for teachers in using technology (Bekker *et al.*, 2015). This training should include not only the technical aspects but also pedagogical skills in integrating technology to create an interactive learning environment and support the development of students' digital skills (Jannah, Prasojo and Jerusalem, 2020).

Socio-cultural challenges also play an important role in the success or failure of the implementation of digital literacy in primary schools (Castañeda and Villar-Onrubia, 2023). In many communities, especially those that still hold strong traditional values, the use of technology in learning is often considered unnecessary or even potentially damaging to cultural values (Masyhura and Ramadan, 2021). For example, in some regions, parents may be worried that excessive exposure to technology will distract children from basic learning or make them less interested in direct interaction with others (Jung, Choi and Fanguy, 2024). According to research by (Carroll *et al.*, 2023), negative attitudes from society or parents towards technology can hinder the adoption of digital literacy because parents or communities may oppose the procurement of digital devices in schools or reject digital learning policies. In addition, cultural differences in accepting technology as part of education cause a gap between schools in developed and developing countries (Hagerman and Neisary, 2024).

Although challenges in the implementation of digital literacy exist in both developed and developing countries, the scale and form of these challenges tend to be different. In developed countries, the main challenges are more focused on the issue of technological updates, teacher competence in technology-based teaching methods, and digital security. Meanwhile, in developing countries, infrastructure limitations, teacher competence, digital divides, and socio-cultural barriers are significant challenges and affect the level of digital literacy implementation in primary schools.

The impact of digital literacy on 21st-century skills development

The impact of digital literacy on the development of 21st-century skills in elementary school students includes collaboration skills, problem-solving, critical thinking, and the application of these skills in the curriculum (Andayani, Meter and Setiawan, 2023). Digital literacy has an important role in developing collaboration skills in elementary school students, as technology allows interaction and cooperation between students through interactive digital platforms (Mohammed, 2024). In many developed countries, literature studies show that technology-based curricula provide opportunities for students to work in groups through various digital projects that require effective communication, coordination, and teamwork (Asdar, 2024). Research shows that collaboration skills in children in primary school improve significantly when they engage in collaborative projects that use digital devices, such as internet-based applications and presentation software (Hadiansah, Setiawardani and Sholeh, 2021). For example, learning platforms like Google Classroom allow students to work together even if they are not in the same space, so they learn to coordinate and share information effectively (Palalas and Wark, 2020).

In Indonesia, the integration of digital-based collaborative projects in primary schools still faces challenges, especially related to the limitations of devices and infrastructure. However, when applied, this approach has been shown to improve social skills and cooperation among students. The theoretical implication of these findings is the importance of digital literacy in building interpersonal skills from an early age, while from a practical point of view, the implementation of digital collaboration in the classroom requires teachers to understand and manage appropriate devices so that the collaboration process runs effectively (Setiyadi, Kuswendi and Ristiana, 2019).

Problem-solving skills are one of the core competencies of the 21st century that are closely related to digital literacy (Kinboon, Sanghuaypai and Nantachukra, 2019). Technology offers a variety of tools and resources that encourage students to think analytically and find creative solutions to problems. A study by (Puriasih and Trisna, 2022) shows that students who engage in technology-based learning activities show improved ability in identifying problems, planning solution steps, and evaluating results. Game-based learning programs, for example, provide challenges that require students to think critically and find solutions in a safe digital environment (Azis and Ahmad, 2022).

However, many elementary schools have not applied technology in the context of optimal problem solving, due to budget limitations and lack of teachers' knowledge about game-based learning applications that are relevant for basic education (Sari *et al.*, 2022). The theoretical implication of these findings is that digital literacy provides opportunities for students to develop problem-solving

skills through a practical and interactive approach. From a practical point of view, governments and policymakers need to support teacher training and provide digital resources that allow students to experience the problem-solving process in person.

Critical thinking is an important skill that needs to be developed in the digital information age, where students need to learn to analyze, evaluate, and filter the information they receive (Aumgri and Apirating, 2023). Digital technology, when integrated into the curriculum, allows students to engage in a more in-depth analysis of information. A study by (Pöntinen and Räty-Záborszky, 2020) shows that digital literacy encourages students to question sources of information, verify facts, and develop viewpoints based on existing evidence. In the national context, research by (Rahmawati *et al.*, 2024) shows that although many primary school students in Indonesia have been exposed to digital devices, their critical thinking skills in assessing digital information are still low.

This is largely due to the lack of curriculum guidelines that encourage critical analysis and evaluation of information (Blevins, 2018). For this reason, the development of learning modules that prioritize critical thinking skills and adapt to the digital environment needs to be carried out so that digital literacy can improve students' ability to assess and interpret information in depth. The theoretical implications of these findings are that technology can serve as a medium that strengthens critical thinking skills from an early age, while on the practical side, schools need to adopt a curriculum that facilitates students in analyzing and assessing digital content.

The implementation of digital literacy in the primary education curriculum plays an important role in ensuring that 21st century skills can be developed effectively. Countries with curricula that integrate technology tend to see a greater impact on students' digital abilities. In Finland, for example, the national curriculum has integrated digital literacy at all levels of education, directly influencing 21st-century skills such as collaboration, problem-solving, and critical thinking (Polizzi, 2020) (Iivari, Sharma and Ventä-Olkkonen, 2020). A national study in Indonesia, such as one conducted by (Dopo and Ismaniati, 2016), found that even though the curriculum in Indonesia already contains digital elements, its implementation still requires technical and pedagogical support so that digital literacy can be applied more evenly. Many teachers still need additional training to effectively integrate digital literacy in teaching and learning activities. The theoretical implications of these findings confirm the importance of digital literacy as an integral part of the curriculum aimed at developing 21st century skills, while from the practical side, the development of digital-based modules that are easily accessible and in accordance with the needs of elementary school students is urgently needed.

Digital literacy in Islamic elementary schools must not only address technical competencies but also uphold Islamic ethical and moral values (Sari *et al.*, 2022). In Islamic education, knowledge (*'ilm*) is considered sacred, and every means of acquiring and using knowledge must align with the principles of *maqāṣid al-sharī'ah* (objectives of Islamic law), which include the preservation of religion, intellect, life, lineage, and property. Therefore, the development of digital literacy should be oriented not only towards building 21st-century skills but also towards nurturing a digitally conscious Muslim identity (Rahmawati *et al.*, 2024). In Islamic pedagogy (*tarbiyah Islāmiyyah*), education is not only a transfer of knowledge but also a process of character building (*tazkiyatun nafs*) and moral development. Technology should be used as a tool to reinforce Islamic teachings rather than as a neutral medium. For instance, students should be taught *adab* (Islamic etiquette) in using digital media, such as avoiding *ghibah* (backbiting) in online communication, filtering harmful content, and upholding truthfulness in sharing information, which aligns with the Qur'anic command:

> "O you who have believed, if there comes to you a disobedient one with information, investigate, lest you harm a people out of ignorance…"
> (QS. Al-Hujurat: 6)

The integration of digital literacy must therefore include components that teach students media ethics from an Islamic worldview, such as digital adab, online responsibility, and using technology for beneficial purposes (*maslahah*). Modern technology provides opportunities for expanding access to Islamic learning through various digital platforms. Madrasah Ibtidaiyah can utilize e-learning tools, Islamic educational apps, and online Qur'an learning platforms to make Islamic education more engaging and accessible. However, to avoid the dilution of Islamic values, content curation and teacher guidance are crucial. Teachers must ensure that Islamic content delivered through digital tools is authentic, reliable, and aligns with *Ahlus Sunnah wal Jama'ah* principles. Moreover, Islamic digital literacy should encourage students to develop critical thinking (*fikr naqdī*) while engaging with online content. Students must be trained to distinguish between accurate Islamic knowledge and misinformation that often circulates on digital platforms.

The concept of *amanah* in Islam is central to the ethical use of technology. Every student, as a digital user, holds trust in how they access, use, and share information. This echoes the prophetic teaching:

> "Each of you is a shepherd, and each of you is responsible for his flock…"
> (HR. Bukhari & Muslim)

In the context of digital literacy, this hadith highlights the responsibility students have when interacting in the digital world. Whether it be respecting copyright, avoiding plagiarism, or guarding their own and others' privacy, digital *amanah* is a value that must be integrated into the Islamic digital literacy framework. The development of 21st-century skills such as collaboration, communication, critical thinking, and creativity in Madrasah Ibtidaiyah should be harmonized with Islamic values. For example: (1) Collaboration should reflect *ukhuwah Islamiyah* (Islamic brotherhood), emphasizing mutual respect and cooperation. (2) Creativity must be directed towards producing digital content that promotes da'wah (*Islamic propagation*) or community benefit (*khidmah*). (3) Critical thinking must be grounded in *tadabbur* (deep reflection), particularly when dealing with vast and unfiltered online information. (4) Communication should follow the Qur'anic principle of *qaulan sadīdan* (truthful and appropriate speech). By embedding these values into the development of digital literacy, Islamic elementary schools can produce students who are not only digitally competent but also ethically grounded and spiritually conscious.

CONCLUSIONS AND SUGGESTIONS

The integration of digital literacy in Islamic elementary schools is not only a response to technological advancement but also a strategic step to prepare students for the challenges of the 21st century while maintaining their Islamic identity. This study highlights that technological infrastructure, teacher competence, parental involvement, and supportive government policies are crucial factors that influence the effectiveness of digital literacy in Madrasah Ibtidaiyah. Despite the challenges, such as limited access to digital tools and socio-cultural barriers, digital literacy when guided by Islamic values has the potential to enhance students' critical thinking, collaboration, creativity, and communication skills in a morally responsible manner.

To optimize the implementation of digital literacy in Islamic elementary education, a holistic approach is recommended one that integrates Islamic values into digital practices and pedagogical strategies. Policymakers, educators, and curriculum developers should collaborate to design digital literacy programs that not only improve technological proficiency but also instill ethical behavior in line with Islamic teachings. Teacher training must be continuously enhanced to ensure digital competence is aligned with Islamic educational goals. Moreover, the development of Islamic-based digital content and learning platforms should be prioritized to ensure that technology becomes a means to strengthen, not weaken, students' spiritual and moral foundations.

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