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# Digital Literacy Trends in Islamic Perspective in Higher Education: A Bibliometric Review

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© 2024 The Authors. This open access article is distributed under a (CC-BY License) Abstract: This study examines trends in digital literacy research within higher education from an Islamic perspective while identifying opportunities for its development. Employing a Systematic Literature Review (SLR) method, 188 articles were sourced from Scopus, Sinta 1, and Sinta 2 databases, with 37 articles published between 2019 and 2024 meeting the inclusion criteria for analysis. Guided by the PRISMA framework, the review ensured the validity and reliability of findings, while bibliometric analysis was conducted using VOSviewer 1.6.20. The analysis revealed a sharp increase in publications during 2021, attributed to the rapid digital transformation of higher education amid the COVID-19 pandemic. However, it also highlighted a significant gap in integrating Islamic education with digital technology, despite its potential to improve learning outcomes and quality. The majority of publications originated from Indonesia, China, and Russia, with both quantitative and qualitative approaches dominating the methodologies. These findings offer valuable insights into the evolving landscape of digital literacy in higher education and emphasize the critical need for further research to advance its holistic development.

**Keywords**: Bibliometric review; Digital competence; Digital literacy; Higher education; Online learning; Systematic literature review; VOSviewer

# Introduction

In the current era of digital transformation, the use of digital technology has become an essential element across all levels of education globally. Benson & Kolsaker (2015) he shift towards Industry 4.0 has created an urgent need for digital literacy as a critical competence that students must master to meet various academic competency requirements (Anwar et al., 2018; Emejulu & McGregor, 2019; Handayani et al., 2020);. From an Islamic perspective, digital literacy represents a technological skill that aligns with Islamic teachings and ethics (Kurniawan et al., 2023). Digital literacy, which includes the ability to understand, access, evaluate, manage, and utilize information from digital sources within the context of learning based on Islamic values, becomes a vital foundation for success in the digital age (Rusadi, 2023; Yao & Wang, 2024).

Furthermore, 21st-century competencies require students not only to master the use of digital devices but also to analyze the role of digital applications in daily life and optimize their use (Radovanović et al., 2020). The integration of digital literacy into the curriculum offers opportunities to create a flexible, adaptive, and responsive curriculum that addresses the challenges and needs of the modern era (Masykur et al., 2023). Digital literacy skills not only equip students for academic success but also determine their readiness to compete in an increasingly digitized professional world (Tejedor et al., 2020).

Digital literacy is crucial for higher education institutions. In this era of rapid technological advancement, students need to possess digital literacy skills, especially within the higher education environment (Eraku et al., 2021). Research by Marzuki (2020) shows that digital literacy in higher education

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significantly impacts increasing students' learning interest, motivating them, and deepening their understanding of learning materials. Digital literacy contributes around 66.6% to various learning motivations, particularly when combined with personalized learning (Dalgıç et al., 2024; Marzuki, 2020; Rahmatullah. & Napis, 2023).

However, according to Anuradha and colleagues, the implementation of digital literacy in learning in Indonesia and other countries still faces several challenges. One of the main obstacles is the lack of infrastructure in higher education institutions that fully supports digital literacy-based learning. In addition, the economic conditions of some students are insufficient, compounded by the challenge of the vast amount of information that must be accessed. The inequality of access to digital media and communication services from internet providers also affects students' digital skills and their confidence in utilizing digital media optimally (Mathrani et al., 2022). Research by Masykur et al. (2023) suggests that students often fall victim to fake information, hoaxes, hate speech, pornography, and other negative content due to a lack of ability to filter the information they receive. A study by Masykur et al. (2023) also highlights that students frequently become victims of fake news, hoaxes, hate speech, pornography, and various other harmful content because of their inability to properly filter the information they encounter.

In Islamic teachings, the concept of information literacy has long been acknowledged. This is evident in the Qur'an, specifically in Surah Al-Hujurat, verse 6, which underscores the critical importance of verifying information (tabayyun) before accepting it. Allah Subhanahu Wa Ta'ala states

"O believers, when a wrongdoer brings you information, verify its accuracy to avoid acting out of ignorance and causing harm, which may lead to regret over your actions". (OS. Al-Hujurat 49:6)

As narrated in a Sahih Hadith recorded by Muslim: " From Abdullah bin Mas'ud, certainly Muhammad said, 'Shall I let you know what al-'adhhu is? it is namimah, the act of spreading records to sow discord among humans." (H.R. Muslim).

Although digital literacy holds significant potential for enhancing learning in higher education, previous studies (Baber et al., 2022; Farias-Gaytan et al., 2023) from the 2017–2021 period predominantly focused on

the early integration of technology in learning and tended to be limited to theoretical analyses. In contrast, this study examines the 2019-2024 period as a more recent timeframe, highlighting the shift toward digital learning processes driven by the COVID-19 pandemic. Other studies (Adnan, 2022; Ashari et al., 2023; Samane-Cutipa et al., 2022; Utaminingsih et al., 2023) have predominantly focused on primary, secondary, or high school education, while this research focuses on higher education, addressing a gap in understanding the implementation of digital literacy in this context. Moreover, existing research (Galán et al., 2021; Gumede & Badriparsad, 2022) does not provide a comprehensive view of global trends and publication patterns in this field. This study offers a novel contribution by employing bibliometric analysis to map the research trends in digital literacy in higher education learning over the past six years (2019-2024), filling a gap in an underexplored area of research.

The dynamics and challenges of digital literacy will become increasingly complex in the future, demanding effective and efficient integration into the learning process. To ensure the optimization of digital literacy across various aspects of life, ongoing research is essential. Therefore, a literature review through bibliometric analysis is crucial for analyzing and evaluating the development of digital literacy in higher education on a global scale.

Although studies by Reddy et al. (2020); Ting (2015) have addressed related topics, systematic reviews of scientific publications on digital literacy in higher education using bibliometric analysis remain very limited. Therefore, this study aims to review the development of research on digital literacy in higher education from 2019 to 2024, with the objectives of exploring research trends, mapping key themes, and identifying their implications, while also playing a crucial role for policymakers. This research focuses on four main questions that will form the framework for this exploration:

RQ1: Analyze publication trends, contributors, citations, and the countries with the highest contributions.

RQ2: Visualize research trends in digital literacy.

RQ3: Explore research methods used.

RQ4: Identify trends among the top five articles.

#### Method

#### Research Design

This study integrates a literature review with bibliometric analysis to explore citations and scientific publications, providing a comprehensive foundation for advancing research in a specific field (Kolle, 2017; 1013

Linnenluecke et al., 2020; Satari et al., 2024; van Dinter et al., 2021). Literature reviews provide readers with insights into the latest research on a specific topic (Carrera-Rivera et al., 2022; Matahari et al., 2023). Data for this analysis were sourced from Scopus, Sinta 1, and Sinta 2 databases using platforms like Google Scholar, Mendeley, Taylor & Francis, ERIC, Wiley, and Publish or Perish. Covering publications from 2019 to 2024, the study focuses on recent trends in digital technology in education to address the challenges of the 21st century. A total of 172 relevant publications were identified based on specific keywords. The PRISMA framework utilized, encompassing three key was stages: identification, screening, and eligibility assessment (Khaw et al., 2023; Paul et al., 2021).

Bibliometric analysis is used to reveal recent traits in article and journal overall performance, map collaboration styles, and discover interconnections within intellectual domains based on existing literatur (Donthu et al., 2021; Fajri et al., 2024). The bibliometric approach enables researchers to understand the development of a research field by analyzing top-cited works, geographical distributions, and mapping relationships between various fields, publications, topics, and authors (Lim & Kumar, 2024; Suprapto et al., 2021). The researchers utilized VOSviewer as a tool to extract relevant data (Shabira et al., 2024) The study began by identifying 172 articles from Scopus, Sinta 1, and Sinta 2. These articles were then screened using Covidence guided by PRISMA. Selected data were processed using Mendeley and Excel, and the analysis results were visualized with VOSviewer to identify patterns within the data.



Figure 1. Research Procedure

#### Search Strategy

The literature search strategy in this study was conducted online (González-Zamar et al., 2020), utilizing articles indexed in Scopus and journals categorized as Sinta 1 and Sinta 2. The primary reference sources included Sage Journals, ScienceDirect, Taylor & Francis, Google Scholar, ERIC, Wiley, and Publish or Perish. These sources were selected for their high quality and accessibility for retrieving relevant information, as outlined in Table 1.

<b>Fable 1.</b> Data	base Search	1 Strategy
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Filter	Description
Year	2019-2024
Subject area	Social science
Keywords Filter	Islamic digital literacy,
-	Islamic digital, Islamic
	literacy, Islamic and
	technology, Digital era
	islamic education, Digital
	literacy or higher education
Source type	Jurnal open
	access
Language	English Language
Document type	Article

A total of 172 articles were obtained from various sources, including ScienceDirect (72 articles), Google Scholar (25 articles), Sage Journals (32 articles), Taylor & Francis (32 articles), ERIC (6 articles), and Wiley (7 articles). All articles were identified and analyzed for their relevance to the research questions and objectives. The selection process followed the PRISMA guidelines to minimize errors and biases, encomp assing criteria for selection, data extraction, duplication removal, and study selection based on titles, abstracts, and keywords (Nguyen & Thai, 2023).

Data Selection Criteria

Table 2. Inclusion And Excl	lusion Criteria
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Inclusion	Exsclusion
Must inlove digital lietarcy	Not inloving digital
in higher education	literacy in higher education
Must publish from dari 2019	Outside the speciied time
- 2024	
Article only	Editorials, reviews non
	empirical studies
Must be english journal	More
scribed	
Digital literacy	More
College	More
Open access articles	Paid Article
Only scopus sinta 1 and 2	More
articles	

The selection of literature data at this stage is carried out rigorously to obtain articles that align with the predetermined keywords (Wang & Si, 2023). The study presented by Chen et al. (2022) outlines that the criteria used involve two stages: inclusion and exclusion. These stages will be explained below, with careful consideration to ensure that the selected documents are of high quality.

#### Data Selection Proses

The data selection process in this article begins with the use of literature keywords to avoid researcher bias and ensure the validity of the selected data (Gallego-Losada et al., 2022; Yang et al., 2021). The principle attention of the selection was to identify topics applicable to the study. Furthermore, the data was filtered using Covidence to ensure accuracy in the data extraction process. Literature mapping was conducted in September 2024, which involved three main gle stages.



Figure 2. PRISMA Flow Diagram

The article selection process in this study consists of three main stages. In the first stage, namely identification, filtering is carried out to find duplication of documents. Of the 188 articles obtained from Scopus, Sinta 1 and 2 journals with the keywords used were "Islamic Digital Literacy, Islamic Digital, Islamic Literacy, Islamic and Technology, Digital era Islamic Education, Digital Literacy in Higher Education. 57 duplicate articles were found, leaving 132 articles. The second stage, screening, involved selection by topic and full text (keywords, abstracts, participants), resulting in 100 articles that fit the inclusion criteria and 32 articles that were excluded. After further analysis of the full text, 37 articles were retained according to the inclusion criteria, while 63 were excluded due to participant incompatibility. The third stage, inclusion, included final reporting of the number of eligible articles, resulting in 37 articles to be used in data extraction and

further analysis using Excel with relevant citations and bibliographic information.

#### Data Analysis

The selected articles were exported in RIS format after meeting the inclusion criteria. This data was then imported into Mendeley to ensure the accuracy and completeness of metadata, followed by computational mapping using VOSviewer. Additionally, the data was converted to CSV format and organized in Microsoft Excel to support trend analysis, gap identification, and the exploration of development opportunities. The analysis encompassed annual publication trends, citation counts, author and country productivity, as well as dominant research methodologies. These findings provided insights into current research trends in digital literacy within higher education (Farias-Gaytan et al., 2023).

#### **Result and Discussion**

Recent research on digital literacy has garnered significant attention, particularly in higher education, where each college students and teachers have to develop digital competencies to navigate an increasingly digitized workforce (Khan et al., 2022; Rusadi, 2023). This study seeks to analyze and explore trends in publications, citations, journal contributions, visualize trends, and identify gaps and potential areas for further development related to digital literacy in higher education in various countries.



Figure 3 Publication and Citation Trends

Figure 3 suggests the trend of guides and citations associated with digital literacy research in the context of higher education during the 2019-2024 period. The most publications in scopus journals were in 2021 with 10 articles, while only 1 publication in sinta 1 & 2 journals in 2021. A significant peak occurred in 2021, which coincided with the massive transformation towards digitalization in higher education because of the COVID-19 pandemic. Research by Monteiro & Leite (2021) found out that many higher education institutions are not ready for this sudden change. Meanwhile, Nikou & Aavakare (2021) emphasizes the importance of facilitating the adoption of more adaptive educational technologies to build a future learning ecosystem that is sustainable and responsive to the needs of digital education.

Digital literacy citation trends experienced a significant spike in 2020 with 210 citations and continued to increase to reach 257 citations in 2021. This increase reflects the high demand for technology-based research during the COVID-19 pandemic (Hew et al., 2020) research by Mathrani et al. (2022) highlighted the emergence of the digital divide during online learning, particularly in developing countries, with an emphasis on the gender gap. Meanwhile, research by Strydom et al. (2021) emphasizes the importance of digital literacy in higher education, especially for prospective teachers, as well as the challenges they face in integrating technology to create authentic learning.

Table 3. Author Trends with Top Citations

Article author	Number of
	citation
Santiago tejedor, laura cervi, ana pérez-	116
escoda and fernanda tusa jumbo	
Claire mcguinness, crystal fulton	60
Anuradha mathrani, tarushikha sarvesh	56
and rahila umer	
Shahrokh nikou & milla aavakare	50
Zhi-jiang liu	47

Table 3 highlights the authors with the highest citation counts in digital literacy research within the context of higher education. The most frequently cited authors are recognized as key influencers in this field. Among the 37 articles analyzed, a total of 94 authors were identified, with 28 engaging in collaborative publications. The study by Tejedor et al. (2020) became the most cited researcher with 116 showing significant influence in the context of digital literacy. Research by José Gómez-Galán a, Jose Ángel Martínez-López c, Cristina Lázaro-Pérez c, María del Mar Fernández-Martínez has also played an important role in promoting the adoption of digital literacy in different countries (Galán et al., 2021).

Table 4. Top Journal Home Contributors

Article source	Туре	Total
Education and information	Scopus	3
technologies		

Article source	Туре	Total
Cogent education	Scopus	2
International journal of emerging technologies in learning	Scopus	2
Sustainability (switzerland)	Scopus	2
Journal of islamic education	Sinta 1	1

Table 4 identifies five leading journal houses that maintained articles related to digital literacy in the context of higher education during the 2019-2024 period. Education and Information Technologies, a Scopusindexed journal, noted the publication of three articles highlighting the importance of preparing future teachers for the challenges of the digital age (Arek-Bawa & Reddy, 2024; Lao et al., 2018; Mathrani et al., 2022; Peled, 2021). another article explored the impact of online studying on college students' professionalism in the teacher expert education program in Indonesia (Musthofa et al., 2023). In addition, journal houses such as the International Journal of Emerging Technologies in Learning and Sustainability (Switzerland) also contributed to this literature, although only one article was found in Indonesia. Those findings emphasize the significance of global and national collaboration to support digital literacy in higher education.



Figure 4. Countries and number of article publications

Figure 4 shows the distribution of published articles associated with digital literacy in higher education based totally on data from Scopus, Sinta 1, and Sinta 2. A total of 38 countries contributed to these scientific publications, with Indonesia dominating with 13 articles, followed by China and Russia with 3 articles each. South Africa, Spain, and France contributed 2 articles each, while countries such as Finland, Sweden, and Pakistan contributed 1 article each. Asian countries, especially Indonesia, are the main contributors to digital literacy research, in line with the trend of technology integration in education in the Asian region (Sánchez-Caballé et al., 2020).

Research by Sun et al. (2022) emphasizes the importance of high-quality online learning, platform support, and collaboration to create a conducive surroundings for innovation. Information literacy, which includes information awareness, discrimination and application, significantly affects graduate innovation performance, making it an essential skill in sustainable development in the digital era (Shelyugina et al., 2022).



Figure 5. Visualization of Inter Author Collaboration

Figure 5 shows the collaboration network between authors in digital literacy research, visualized through VOSviewer. The analysis included 94 researchers from 37 articles with 8 co-authorship connections. Each cluster represents a group of authors who frequently collaborate on a particular research project (Spante et al., 2018). Authors such as Ashari et al. (2023)are in the light blue cluster and connected to other names such as Ortega, Luis Omar Peña, indicating close collaboration related to research focused on providing digital tools to support students' digital literacy, which can drive educational innovation (Okoye et al., 2023). Meanwhile, Aziz, Hafidh, who sits at the intersection of the green and light blue clusters, acts as a link between the various research groups.

Authors like Zhao, Liping, who belong to the purple cluster, appear to have more specific engagements and tend to work on more niche topics. On the other hand, Casselden, Biddy, while appearing more isolated from the large cluster, focus on very specific and academically relevant research areas. Significant differences in self- perception were found by gender, level of education, area of residence and previous training experience, with male students tending to rate their competence higher than female students (Casselden & Pears, 2020).

Analysis of the 37 articles identified 102 keywords related to digital literacy research. Applying a minimum threshold of two occurrences per term, 18 keywords met the inclusion criteria. The most prominent keyword was "Digital Literacy," appearing 12 times, followed through "Higher Education" with 10 occurrences and "Online Learning" with 4 occurrences. Additionally, "Digital Education," "Educational Technology," and "Covid-19" each appeared twice. These six keywords illustrate the research focus on students' perceptions of digital competence, including the influence of personal factors such as gender, education level, area of residence, and prior training experience (Casselden & Pears, 2020). The inclusion of "Covid-19" as a keyword underscores the pandemic's profound impact on global education, significantly accelerating the adoption of distance getting to know technologies (Tejedor et al., 2020).

<b>Fable 5.</b> Keywords That Appear Freque
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Keyword	Occurences	Total link
		strength
Digital literacy	12	53
Higher education	10	47
Online learning	4	18
Digital education	2	12
Educational	2	11
technology		
Covid 19	2	10
Digital competency	2	10
Lockdown	2	10
Multimedia	2	10
Digital technologies	2	9
Information literacy	2	9
Student	2	9
University student	2	9
Digital competence	2	
		8
Ict	2	8
Indonesia	2	8
Collaborative	1	7
partnership		
Institute of islamic	1	7
religion		

Digital competency, characterized by the appearance of the keywords "Digital Competency" and "Lockdown" twice, reflects that the pandemic and lockdown policies have driven transformation in the learning process in Indonesia. This change demands the integration of digital technology to fulfill the need for mastery of digital competencies among teachers and prospective teachers (Hidayat et al., 2023). As expressed by Nannaware et al. (2021) the ongoing pandemic and its uncertain duration make online teaching an urgent necessity.

keywords "Multimedia," The "Digital Technologies," "Information Literacy," and "Student," each appearing twice, highlight the critical role of technology-based learning media in enhancing students' comprehension of educational material. The inclusion of "Information Literacy" underscores the necessity for students to critically evaluate and respond to misinformation or fake news (hoaxes). This principle aligns with Islamic teachings, as reflected in Surah An-Nur, verse 11, where Allah Subhanahu Wa Ta'ala emphasizes the importance of integrity and discernment in addressing falsehoods:

إِنَّ ٱلَّذِينَ جَآءُو بِٱلْإِفْكِ عُصْبَةَ مِّنكُمْ أَ لَا تَحْسَبُوْهُ شَرًّا لَّكُم أَ بَلْ هُوَ خَيْرٌ لَّكُمْ أَ لِكُلِّ ٱمْرِي مِنْهُم مَّا ٱكْتَسَبَ مِنَ ٱلْإِثْمِ أَ وَٱلَّذِي تَوَلَّىٰ كِبْرَهُ مِنْهُمْ لَهُ عَذَابٌ عَظِيمٌ " Indeed, those who spread false news are among you. Do not assume that such news is entirely harmful; rather, it may hold lessons for your benefit. Each individual involved will be held accountable for their actions, and those who bear the greatest responsibility for spreading falsehoods will face severe punishment." (QS. An- Nur 24: Verse 11)

Students exhibit diverse preferences in creating and utilizing digital learning materials (Cuyag et al., 2024). Most students prefer digital text (73.3%) and images (56.8%) for independent study, while audio recordings (12.5%) and videos (3.8%) are less popular. Digital texts are considered easily accessible and support collaboration, while images help visualize notes. Audio recordings offer learning flexibility, and video recordings are used for self- evaluation, such as in presentations.



**Figure 6**. (a) Network visualization co-occurence, (b) Overlay visualization co-occurence, (c) Density visualization co-occurence.

In addition, the majority of students (84.2%) used videos, and 82.6% utilized existing digital texts for reasons of flexibility and depth of understanding. The use of digital images (48.5%) and audio (11.7%) is relatively less frequent, although images support visual comprehension, and audio is relevant for auditory learners (Nouri, 2019). This phenomenon reflects the vital role of digital technology in supporting students'

diverse getting to know options and needs. The Institute of Islamic Religion's keywords also highlight students in Islamic universities utilizing digital platforms, such as online lectures, to effectively access academic and religious resources, which not only support the study of Islam but also contribute to Islamic learning. On the achievement of academic goals while strengthening Islamic values and 21st century skills.

The Figure 6 is a visualization of the keyword network in the literature related to "digital literacy" generated using tools such as VOSviewer. Of the 102 keywords identified, the keyword "Digital Literacy" is the main center connected to other keywords such as Learning," "Digital "Online Technology," and "Educational Technology," forming the core of the network. This reflects the important function of digital era in education, especially in response to the pandemic that has driven the development of online learning (Hassankhani et al., 2021; Mathrani et al., 2022). Research by Visintini (2022) highlights the transformational impact of digital education leadership, the adoption of innovative teaching practices, and the critical role of digital education leaders in driving social change and transformation of educational practices. This analysis highlights key trends, illustrates the relationships between themes, and reinforces the academic relevance of this topic.

Figure b shows a network overlay visualization of keywords in the literature related to "digital literacy," illustrating the development of research trends over the period 2020-2023. The brighter colored nodes (yellow) reflect the current research focus in 2023. Topics such as digital competence, emerging technologies in learning, and blended learning indicate increasing attention to innovations in digital teaching and learning, especially in supporting sustainable development in the digital age (Sun et al., 2022). Studies by also highlights recent trends in the role of digital education and collaborative partnerships in strengthening digital literacy globally. The close relationship between these concepts reflects the dynamics relevant to supporting the transformation of education in the digital age. This analysis provides a comprehensive overview of the interconnectedness of the themes and the changing focus of research over time.

Figure c visualizes a density map of keywords in research related to "digital literacy," with lighter colors (yellow) representing keywords with higher frequency of occurrence and strength of association. This map highlights digital literacy as the main focus of research, with a very dominant frequency and linkage compared to other keywords. Areas of high density, such as online learning, digital competence and educational technology, represent the most prominent topics, especially in the context of educational change triggered by the COVID-19 pandemic (Plessis et al., 2022).

The digital technology, multimedia, and digital competency, reflecting attention to technological innovation and the development of digital competencies. In addition, topics such as digital education and initial teacher programs indicate a focus on increasing educators' capacity to adopt digital technologies (Islami et al., 2022). The Arabic learning in Islamic education still faces challenges in integrating digital technology, which actually has the potential to significantly enhance the high-quality of learning processes and outcomes. These trends illustrate the evolving transformation of education to meet the global need for digital literacy. This analysis offers an in-depth understanding of the research focus as well as the relevance of key topics in the related literature.

Digital literacy research is conducted using various approaches to analyze data comprehensively. The choice of research method has a important role in figuring out the suitability of the research results with the expected objectives (Sogalrey et al., 2024). In this study, 37 articles published between 2019 and 2024 were analyzed to identify the maximum typically used research methods in digital literacy studies as well as trends in their use in recent years.



Figure 7. Digital Literacy Research Methods

Figure 7 illustrates the distribution of research methods used in digital literacy studies. Quantitative methods dominate at 49%, followed by qualitative methods at 32%, reflecting the focus on numerical databased analysis as well as in-depth exploration of social context. This distribution indicates that quantitative methods are more often chosen by Digital Literacy researchers, possibly due to their advantages in producing measurable data and easier conclusions (Nawi, 2020). Mixed methods accounted for 14%, indicating an integrative approach that combines the benefits of both quantitative and qualitative methods. Meanwhile, research and development (R&D) based methods accounted for only 5%, indicating a more limited attention to product or model innovation. This distribution confirms that quantitative approaches remain the main method in digital literacy research, while other methods serve as complements to enrich the analysis.

g a quantitative insights into the subject matter icles. The findings and observation are the most

Digital literacy research using a quantitative approach in this study includes 18 articles. The findings show a variety of research methods, with surveys being the most frequently used instrument, followed by the use of questionnaires, respondents, experiments and simple linear regression to analyze educational phenomena on a broad scale (Hayward et al., 2021). Quantitative approaches are used to measure digital literacy, assess digital competencies, learning skills, and the effectiveness of learning systems. This study demonstrates that digital literacy significantly enhances academic competence and employability, yielding positive outcomes for individual performance in both educational and professional domains (Khan et al., 2022).

Conversely, this study's qualitative research component comprises 12 articles, offering in-depth

insights into the subject matter. It shows that interviews and observation are the most widely used in digital literacy. This is used to see directly into the field, indepth interviews with students or lecturers regarding their expertise in using technology in the classroom or prospective teachers integrating learning technology in the classroom and developing digital literacy courses based on authentic learning principles (Peled, 2021; Strydom et al., 2021). The mix-methods approach combines qualitative and quantitative approaches to obtain a comprehensive understanding of a phenomenon. Research by Rusadi (2023) shows that Islamic Education students at State Islamic Universities in Indonesia are at a "good" level. Students showed strong functional skills in using digital devices to access religious information.

Table 6	Trends of Tor	, Five Dio	vital Literacy	v Articles in The La	st 6 Years	(2019-2024)
I ubic 0.	11 CHOUD OF 10p		filler Difference y	Intracted in the Lu	or o reard	(201) 2021)

Title	Authors	Results	Recommendation
Digital literacy and	Santiago	The majority of students favor videos	This study recommends that
higher education	Tejedor, Laura	and audiovisual materials as primary	universities should rethink and
during covid-19	Cervi, Ana	learning resources. Despite expressing	redesign learning environments that
lockdown: spain, italy,	Pérez-Escoda	confidence in their digital skills, many	not only rely on digital platforms but
and ecuador	and Fernanda	reported encountering significant	also enhance and complement students'
	Tusa Jumbo	amounts of misinformation during the	learning through digitalization.
		lockdown. This study underscores the	
		challenges and negative perceptions	
		surrounding the quality of education	
		during lockdown periods and	
		emphasizes the critical need to	
		enhance digital competencies among	
		educators.	
Digital literacy in	Claire	The results of this examine suggest	The research suggests the need for
higher education: A	McGuinness,	that e-tutorials are commonly	policy development at the school and
case study of student	Crystal Fulton.	properly-acquired by using students in	university levels concerning e-tutorials
engagement with e-		phrases of design and	as an integral part of teaching and
tutorials using		usabilitymaximum college students	learning. It emphasizes that
blended learning		evaluated their virtual literacy	comprehensive policies at the
		positively and felt that the e-tutorials	university level are essential to support
		were applicable and contributed to	staff and manage students' expectations
		their understanding of course	regarding their learning experience.
D		materials.	
Digital divide	Anuradha	The digital divide remains a essential	The study emphasizes the need to
framework: online	Mathranı,	issue, with significant disparities in get	support policymakers in prioritizing
learning in developing	larushikha	admission to to technology and	strategies that promote technology
countries	Sarvesh and	internet connectivity. woman college	inclusion and diffusion across different
during the COVID-19	Rahila Umer	students are disproportionately	income levels and gender groups. It
lockdown		affected, as they often shoulder	also highlights the importance of
		additional household responsibilities	designing targeted digital initiatives to
		and have less access to devices	position societies more equitably on the
		compared to their male peers. This	global stage.
		study nightights the urgency of	
		aduressing those inequities to enhance	
		learners inside the context of online	
		learners inside the context of online	
		learners inside the context of online studying.	

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Title	Authors	Results	Recommendation
An assessment of the	Shahrokh	This studies highlights the importance	It recommends the development of
interplay between	Nikou & Milla	of digital literacy in improving the	strategies aimed at fostering the growth
literacy and digital	Aavakare	usage of generation inside academic	of literacy dimensions that will
Technology in Higher		putting. It suggests that improving	facilitate leaps toward future
Education		these skills can foster greater adoption	educational technologies and meet the
		of technology among university staff	expectations of future educational
		and college students.	environments.
Digital Literacy and	Zhi-Jiang Liu	The take a look at exhibits that teachers	The research further underscores the
Digital Didactics as	Zili-jiang Liu	in Russia reveal higher degrees of	necessity of continuous expert
the Basis for		digital literacy in comparison to the	improvement for educators to enhance
New Learning Models		general population with school	the integration of technology into
Development		teachers achieving an 87% score and	training
Development		higher education lecturers scoring 88%	training.
		on the digital literacy index. It	
		highlights the critical need for a	
		modern digital literacy development	
		model emphasizing the integration of	
		real virtual and neurocognitive	
		learning environments to enhance	
		educational practices.	

Table 6 presents the trends of the top five articles in Digital Literacy research from 2019 to 2024 with the highest citations. The studies by Tejedor et al. (2020) and Mathrani et al. (2022) highlight the adaptation of higher education to digital literacy challenges during the COVID-19 lockdowns in Spain, Italy, and Ecuador, as well as the digital divide in growing nations. These studies emphasize challenges in accessing digital resources, especially for women, the importance of teachers' digital skills, enhancing university communication, and teaching methodologies. They also offer policy recommendations for more inclusive and equitable online learning.

According to Nkansah & Oldac (2024), the evaluation of students' digital literacy is based on their experiences with technology, the ability to use digital tools in education, and the barriers they face. Their findings indicate a need for intensive training and institutional support to meet the demands of the digital era, while recommending blended learning approaches to improve these skills (McGuinness & Fulton, 2019). The research by valuates students' digital literacy skills based on their ability to use digital technology in activities. Students demonstrated academic competencies in searching for, sorting, processing, and evaluating information from relevant sources to meet academic needs. Additionally, they possessed basic skills in using word processing software, presentation applications, and the internet to support academic tasks, including communicating online with instructors or peers.

Additionally, studies by Nikou & Aavakare (2021) and Liu et al. (2020) investigate the use of digital technology among university staff and students. These studies explore the interplay between data literacy, digital literacy, and the purpose to adopt technology, particularly in the context of the rapid digital transformation of higher education driven by the pandemic. They highlight the pivotal role of digital literacy and pedagogical approaches in fostering innovative learning models that seamlessly integrate real, virtual, and neurocognitive learning environments.

Research on digital literacy highlights both challenges and opportunities supplied by way of the digital transformation of higher schooling. Institutional responses to digital literacy demands during the COVID-19 pandemic emphasize the critical need to enhance educators' digital skills, establish inclusive online learning policies, and bridge access gaps, particularly in developing nations. Assessments of students' digital literacy underscore an urgent need for intensive training to improve their ability to utilize digital technology effectively for academic activities and learning environments. blended Scholars also emphasize the position of digital literacy and pedagogical strategies in developing innovative learning models that integrate real, virtual, and neurocognitive environments to bolster digital competencies amidst educational transformation. These findings collectively highlight the necessity for comprehensive and collaborative techniques to improve sustainable digital literacy in the higher education sector.

## Conclusion

This study identifies trends in digital literacy in higher education from an Islamic perspective, 1021

highlighting a surge in publications in 2021 driven by the digital transformation triggered by the COVID-19 pandemic. The analysis of 37 articles reveals the dominance of quantitative and qualitative approaches, with significant contributions from Indonesia, China, and Russia. However, the integration of technology into religious education remains limited. This study emphasizes the need for more comprehensive development of digital literacy to address the challenges of education in the digital era.

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Mohamad Fauzan Adima (M.F.A.): contributed to the conceptualization, methodology, original draft preparation, and the results and discussion sections; Baharudin (B): provided validation, contributed to the methodology, and assisted with reviewing and editing; Imam Syafei (I.S.): oversaw the supervision, conclusions, and final review; Siti Zulaikha (S.Z.), Beti Susilawati (B), and Qonita Shabira (Q.S.) were responsible for validation; with Qonita Shabira also contributing to translation;

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The authors declare that there are no conflicts of interest related to this research.

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