

Examining the Digital Revolution in Religious Education: A Bibliometric Exploration of Crises, Opportunities, and the Future of Research 2009-2025

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ABSTRACT

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This study uses bibliometric analysis to explore research on digital technology-based religious learning from Scopus-indexed publications between 2009 and 2025. The growth of technology, accessibility of digital devices, and learning innovations have driven increasing research output, while challenges such as low digital literacy, technological barriers, and online misinformation remain key issues. By analyzing 133 English-language journal articles with Scopus Analyzer, R, RStudio, and VOSviewer, this study identifies research trends, effectiveness, and challenges in integrating digital technology into religious education. Results show a significant rise in publications from 2019 to 2025, indicating growing academic and practical interest. Indonesia contributed the most publications, with Malaysia showing strong international collaboration. Thematic mapping revealed key clusters such as digital transformation, challenges, and machine learning, reflecting emerging directions and innovation potential in technology-based religious learning. This study highlights opportunities for future research to enhance collaboration, promote innovation in digital religious education, and serve as a reference for ongoing studies in this increasingly vital field.

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1. Introduction

Digital transformation has grown rapidly over the past decade, especially since the COVID-19 pandemic, which indirectly encouraged religious educational institutions to adopt digital technology-based learning models on a mass scale [1]. The paradigm shift from a teacher-centred approach to a more student-centred approach [2] has had an impact on student learning outcomes [3]. A study by the International Society for Technology in Education (ISTE, 2020) reports that 70% of teachers

believe integrating technology into learning can increase student participation [4]. Integrating technology into PAI presents a significant opportunity to enhance the quality of learning. Several learning resources can be obtained through visual sources on the Internet, such as lecture videos or virtual reality-based simulations [5], to help students understand abstract religious concepts more concretely and engagingly [6]. Additionally, digital technology learning platforms, such as Google Classroom, Zoom Meeting, Quizziz, and Kahoot!, enable students to be active and interactive in the learning process [7]. However, the integration of digital technology in learning is not without its problems. The main challenges include low digital literacy among teachers and students, limited access to technology in certain areas, and the distortion of religious information spread in cyberspace. If not anticipated, this will interfere with the mission of Islamic education as Islam *rahmatan lil 'alamin*. In addition, there are also issues related to the authenticity of religious sources circulating in cyberspace [8]. This raises concerns among teachers when using technology, as it can divert attention away from religious values [6]. Therefore, the use of technology should be directed towards a clear goal: to improve the understanding and application of Islamic teachings in everyday life [9].

The integration of digital technology in Islamic education began with the advent of advances in information and communication technology, ushering in the digital age in education at the end of the 20th century [10]. This development was further accelerated during the COVID-19 pandemic, which necessitated students studying online to support the achievement of learning objectives [11]. This study was prompted by the suboptimal use of digital technology in PAI learning. Based on several previous studies, problems in digital-based religious learning generally focus on specific aspects, such as the effectiveness of integrating digital technology in PAI learning. In line with the research reviewed by Emi Rohmiati, this study examines the use of digital media in PAI learning, which has significant potential to enhance the quality of PAI learning [12]. With the availability of digital learning media, such as e-books, interactive applications, and digital learning platforms, students can access learning materials anytime and anywhere. These media can develop their digital skills, helping them to optimally utilize technology in the learning process, including understanding and applying Islamic values. In a study reviewed by Muhammad Faiq Hirzulloh and Tazkia Arifa Annadhif, this research highlights the evidence of Islamic Education in the 4.0 era, which is able to meet societal needs through the application of technology in the learning process. Technological innovation in education trains students' skills in communication, cooperation, quick reactions, and critical thinking. This provides a dynamic understanding of each Islamic concept, ensuring that Islamic religious education does not merely transfer Islamic values, which can cause it to lag behind general education [13].

Furthermore, the research reviewed by Zulaiha also shows that digital technology can not only create interactive learning and improve students' digital skills, but also expand access to learning resources [14]. On the other hand, M. Ibnu Sholeh's research identifies challenges in digital learning, including the digital divide and inadequate infrastructure [15]. Furthermore, the easy dissemination of radical content and its impact on spiritual and radical development [16]. Especially in this era, artificial intelligence is rapidly developing, which, of course, has a significant influence on the dissemination of information. This can have a negative impact if misused [17]. Of course, this includes hindering the optimal application of technology in Islamic education. However, the potential for developing the use of digital media in Islamic education is enormous. However, some of these studies employed a qualitative approach. There are no comprehensive studies that map the direction, trends, and gaps in research in this field using a bibliometric approach. In addition, there is no comprehensive picture of the development of the scientific map in the field of digital technology-based Islamic religious education, which continues to evolve over time.

Scientific contributions that are not systematically mapped result in a lack of reference in designing adaptive and sustainable religious learning development strategies. Bibliometric mapping of scientific literature can reveal dominant themes that are trending each year and influential researchers. This is useful to encourage research innovation based on empirical data [18] in QS. Yunus verse 101, Allah calls on humans to observe His power. This means that humans must utilise all available resources to deepen their understanding in the context of education in the digital era, through

observation and scientific research [19]. This study aims to examine topics related to digital technology-based Islamic education, as represented in indexed publications from the Scopus database from 2009 to 2025, as the starting point for recording this topic in the Scopus database. This study aims to identify the direction, potential, and research opportunities that need to be explored in the future, as the issue of religious education relevant to the digital era is increasingly urgent. This is particularly true for the dissemination of religious information, which is not always reliable in the digital world [16]. Therefore, this research is relevant and significant to systematically and quantitatively examine digital technology-based PAI learning in order to provide strategic reference for educational institutions in formulating learning development policies and assist academics in preparing further research.

2. Method

This study utilized bibliometric analysis methods. Bibliometric analysis is an effective research method that uses statistical and quantitative techniques to analyze patterns in academic literature, thereby providing a structured overview of the research landscape [20]. Data were obtained from the Scopus database on May 16, 2025, at 8:36 a.m., using a Boolean search strategy. The data analyzed covers the period from 2009 to 2025. The analysis process utilized advanced tools such as R and RStudio, VOSviewer, and Microsoft Excel to analyze citations, document content, and relationships between elements in the data set. The analysis was conducted systematically through three structured stages to examine the collected data.

In the first stage, a literature review was conducted to ensure the relevance of the research topic and align it with its theme, while also identifying keywords representative of the research scope [21]. In the next stage, a data search through the Scopus database using the Boolean operator TITLE-ABS-KEY (learning AND Islamic AND digital) yielded 219 publication documents. These documents covered various topics related to digital technology-based Islamic religious education. To make the coverage more relevant, the detailed data search was refined using Boolean with specific queries, applying the following filter criteria: TITLE-ABS-KEY (learning AND Islamic AND digital)) AND PUBYEAR > 2009 AND PUBYEAR < 2025 AND (LIMIT-TO (DOCTYPE, 'ar')) AND (LIMIT-TO (LANGUAGE, "English")) AND (LIMIT-TO (SRCTYPE, 'j')). The second screening yielded 133 relevant documents.

In the final stage, in-depth document analysis was conducted using Scopus Analyzer, R, and RStudio to identify annual publication trends, analyze document distribution patterns, and display details related to countries, authors, and institutional affiliations [22]. The data was then analyzed using Microsoft Excel software. The data was analyzed using Microsoft Excel to produce data visualizations in the form of graphs. The data was further analyzed using VOSviewer to identify research trends, gaps, and research contributions through collaboration patterns, time-based data, and thematic mapping. Through this analysis, it is hoped that a deeper understanding of the development of research related to digital technology-based Islamic religious education can be obtained, as well as recommendations for further research in this field.

The following stages of research are shown in Fig.1.

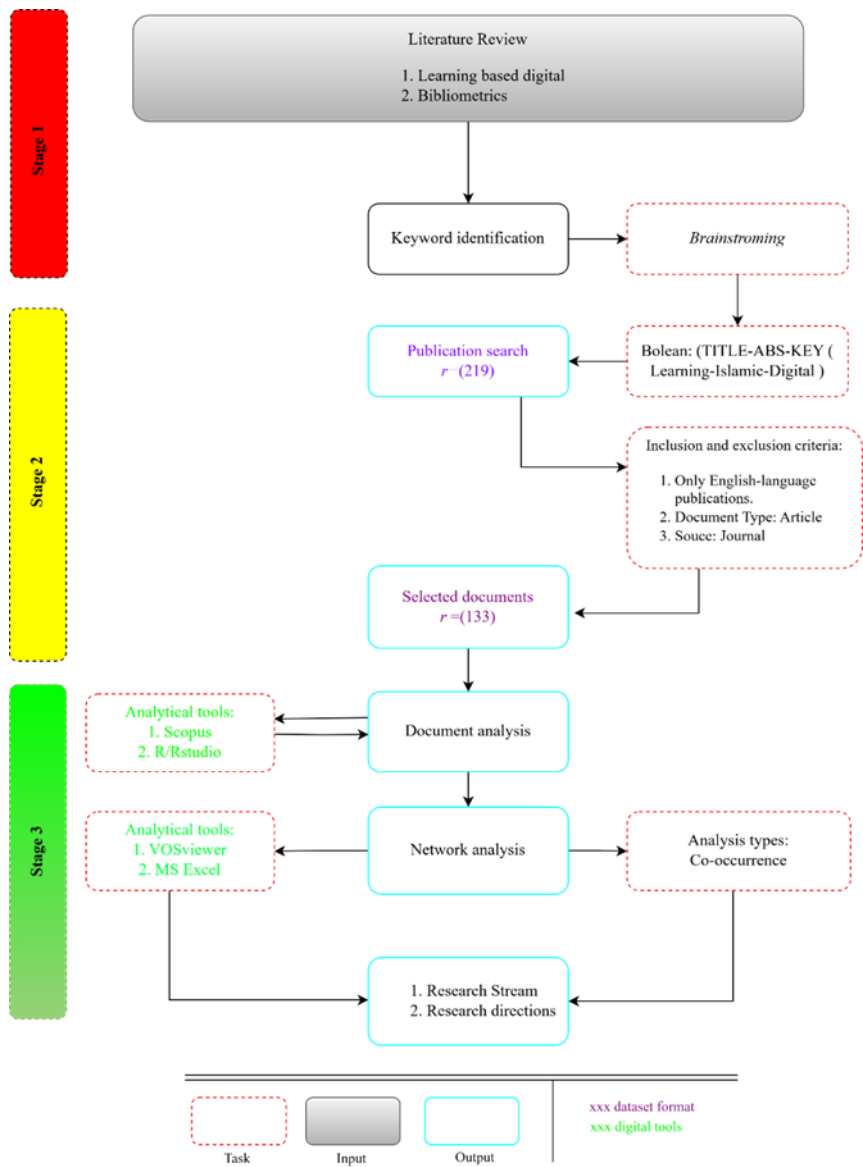


Fig.1. Research Workflow

3. Results and Discussion

Table 1 displays general data from 133 documents collected over 16 periods. This dataset includes 455 authors, 17 of whom are sole authors, and exhibits an international author collaboration rate of 13.53%. The documents include a total of 5,939 references, with an average of 4,173 citations per document.

Table 1. Research data information on digital-based religious education studies

Description	Results
MAIN INFORMATION ABOUT DATA	
Timespan	2009:2025
Sources (Journals, Books, etc.)	99
Documents	133
Annual Growth Rate %	17,93
Document Average Age	3,33
Average citations per doc	4,173
References	5939
DOCUMENT CONTENTS	
Keywords Plus (ID)	73
Author's Keywords (DE)	539
AUTHORS	
Authors	455
Authors of single-authored docs	17
AUTHORS COLLABORATION	
Single-authored docs	19
Co-Authors per Doc	3,62
International co-authorships %	13,53
DOCUMENT TYPES	
article	133

3.1. Document Analysis

3.1.1. Trends in Scientific Publications of Digital-based Religious Learning (2009-2025)

The graph in Fig. 2 shows publication trends from 2009 to 2025. In the early period (2009-2018), the number of publications was still very low and inconsistent, indicating that this topic had not received much attention. Since 2019, there has been a significant increase, particularly in 2020, which marked a turning point with a surge in publications, presumably influenced by the COVID-19 pandemic that encouraged online learning, including religious education. This trend continued to increase, reaching its peak in 2024 with 35 documents, indicating that this theme has become an established research focus. The year 2025 shows a temporary decline with 14 documents, but this is likely to increase as this year's data is incomplete. Overall, the graph reflects the rapid and consistent development of this theme and opens up opportunities for further research on the effectiveness, digital content, and pedagogical approaches in technology-based religious education.

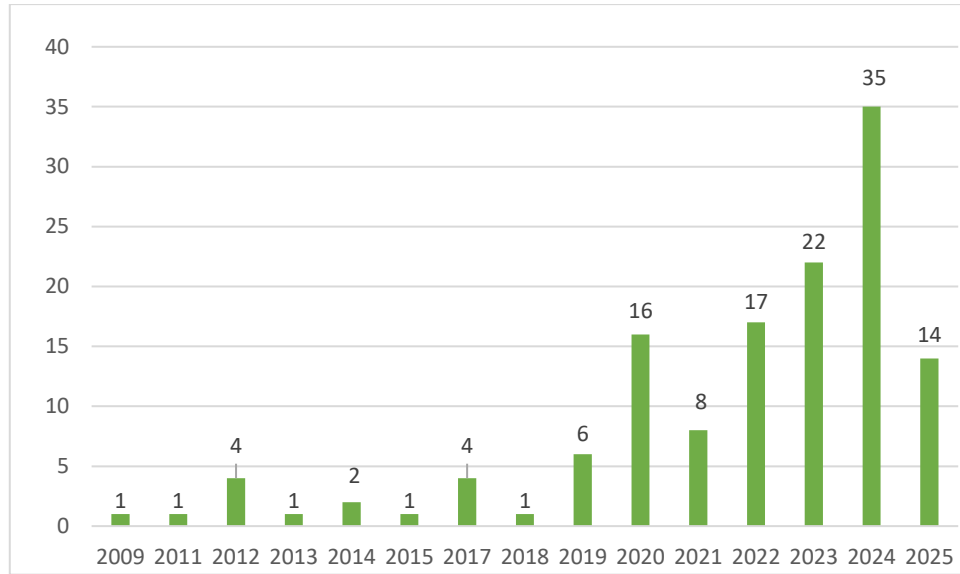


Fig.2. The development of digital religious learning studies from 2009 to 2025

3.1.2. Digital-based Religious Learning Publication Documents by Country

Fig. 3 shows the distribution of publications by country. Indonesia dominates significantly with 78 documents, reflecting a high level of interest and research activity in this field, driven by its large Muslim population and digital education policies. Malaysia ranks second with 25 documents, demonstrating the important contribution of the Southeast Asian region. Meanwhile, countries such as the United States, Australia, Brunei Darussalam, Pakistan, Saudi Arabia, and the United Arab Emirates contributed a moderate number of documents, ranging from 3 to 6. These findings confirm that Southeast Asia is becoming a major centre for research on digital-based religious education, while the contribution of Middle Eastern and Western countries remains limited. This opens up opportunities for international collaboration and comparative studies between regions in developing technology-based approaches to religious education.

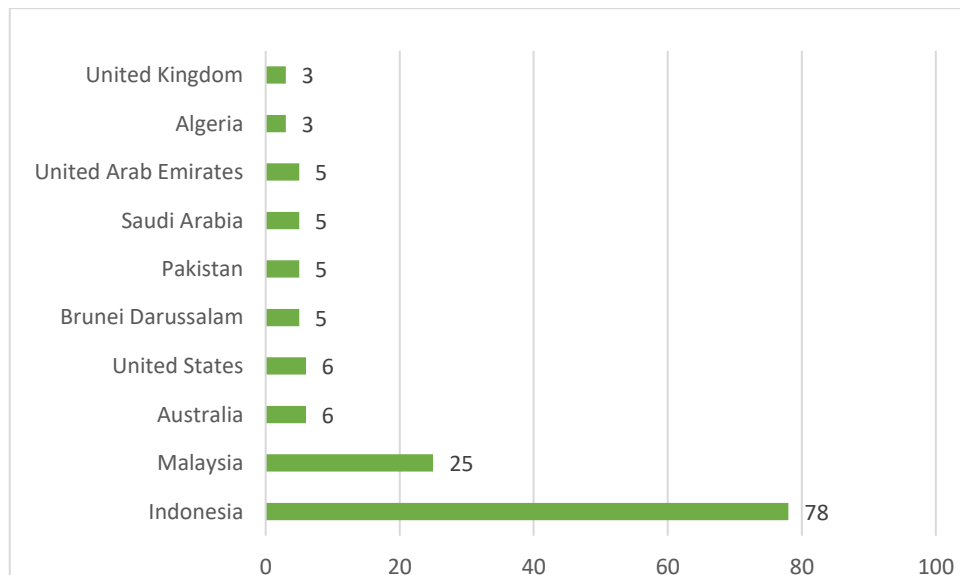


Fig.3. Digital-based religious learning publication documents by country

Based on Fig. 4 below, Indonesia is the country with the highest contribution, with a dominant number of single-country publications, although a small number involve international collaboration. The graph clearly shows that Indonesia is the main centre for research and development in this field. In addition, the country that ranks second with a significant contribution and has a relatively higher

proportion of international collaboration than Indonesia is Malaysia. This demonstrates that Malaysia plays a significant role in regional collaboration in Southeast Asia.

Several Middle Eastern countries, such as the United Arab Emirates, Saudi Arabia, and Qatar, are also involved in publications on this theme, albeit with limited contributions. This demonstrates global interest in integrating technology into Islamic education. Overall, most publications are still dominated by domestic collaboration, while international collaboration remains relatively low. The graph indicates that studies on digital religious learning remain geographically fragmented and are not yet fully integrated into the global research network.

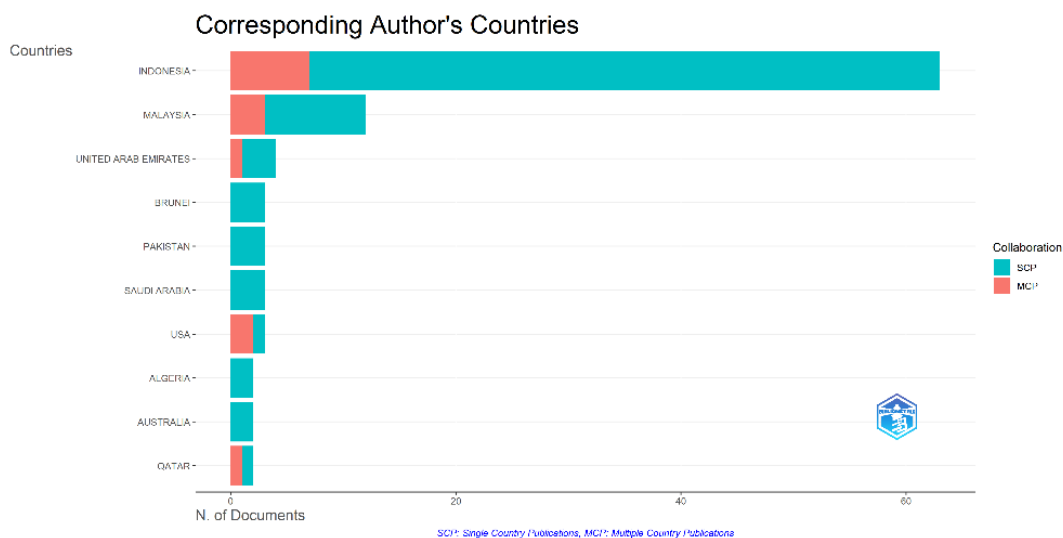


Fig.4. Chart of countries with high contributions to publications

3.1.3. Institutional Contributions in Digital Religious Learning Publications

Fig. 5 shows that Maulana Malik Ibrahim State Islamic University, Malang, and Indonesia University of Education recorded the highest number of publications, with 6 documents each. Meanwhile, eight other institutions, such as UIN Antasari, UIN Syarif Hidayatullah, Universiti Brunei Darussalam, and Universiti Kebangsaan Malaysia, contributed 4 documents each. These findings indicate that Islamic universities in Indonesia and Malaysia are very active in researching the digitization of religious education. The presence of state universities such as the Indonesia University of Education also shows that the approach to this theme is becoming increasingly interdisciplinary. Overall, this graph reflects strong and even institutional involvement across the region, opening up opportunities for cross-border and interdisciplinary research collaboration.

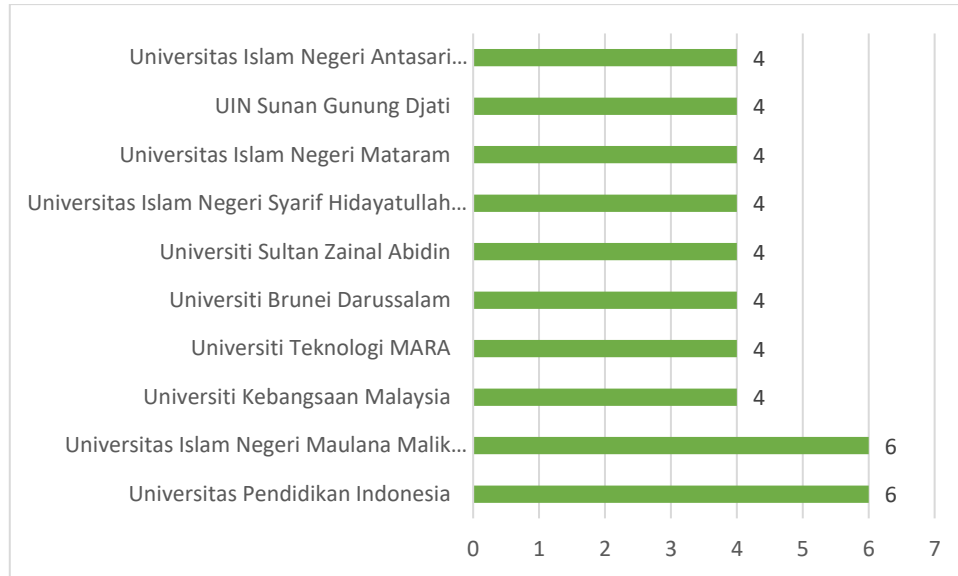


Fig.5. Documents by Affiliation

3.1.4. Leading Author Productivity

Fig. 6 illustrates that the contributions of authors to the theme of 'digital technology-based religious education' are relatively even. The author with the most contributions is Nur, A., who has written three documents, demonstrating his active role in developing this theme. Meanwhile, there are 10 other authors who have each contributed 2 documents, including Haningsih, S., Hamzah, M.I., Hamdeh, E., and Baioumy, N.

These findings indicate that there is no strong dominance by any one figure or group of researchers, but rather collaborative and widespread contributions. This may indicate that this field is still developing and open to many new authors. In addition, the emergence of names from different backgrounds also reflects the multidisciplinary nature of this research, which may involve the fields of religious studies, educational technology, and digital pedagogy. This opens up great opportunities to strengthen collaborative networks between researchers in developing further innovations in the field of technology-based religious learning.

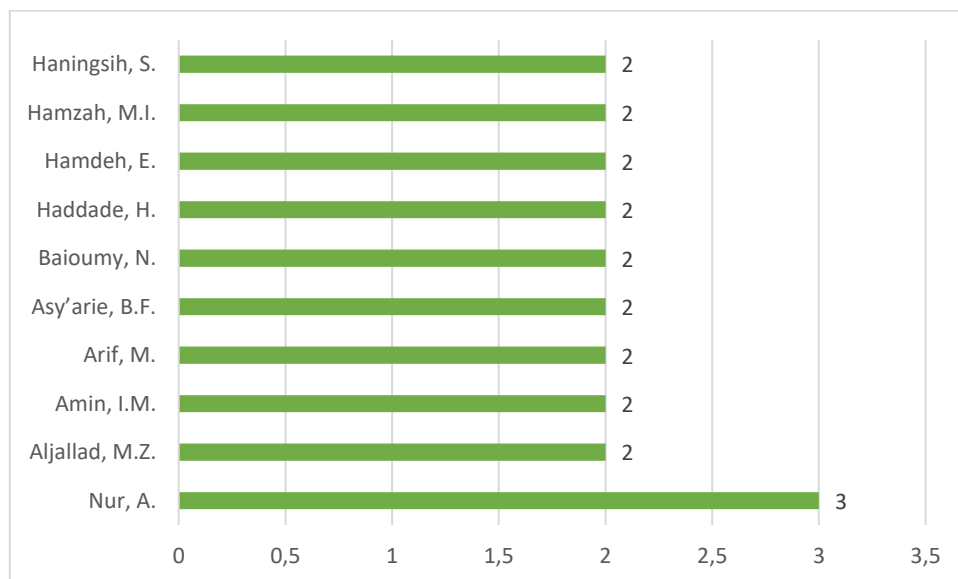


Fig.6. Document by Author

3.1.5. Productivity of Digital Religious Learning Publication Resources

Based on the distribution graph of documents by publication source, there is a significant trend in the field of Islamic education, marked by the dominance of the Journal of Islamic Education as the most productive source with a total of 7 publications. Significant digital transformation has completely changed the global education paradigm, including opening up wider access to Islamic knowledge, enriching learning methods and disseminating Islamic information. The COVID-19 pandemic has also encouraged the adoption of digital technology in Islamic education. These changes have triggered a surge in scientific publications discussing innovations in learning and challenges in Islamic education in the era of digitalization [23].

In addition, leading international journals such as the International Journal of Evaluation and Research in Education, with a total of 6 documents and Cogent Education, with a total of 5 documents, show that this issue has received considerable attention in the global context, especially in the aspects of evaluation and digital learning innovation. The existence of multidisciplinary journals, such as Library Philosophy and Practice, Journal of Social Studies Education Research, and Religions, shows that this study has expanded to various fields of science, including information technology, educational philosophy, and religious studies. Although journals that specifically focus on educational technology, such as Education and Information Technologies, only contributed 2 documents, this still shows the contribution of the technology discipline in supporting the development of religious learning that is adaptive to digital developments. Thus, it can be concluded that studies on digital technology-based religious learning have interdisciplinary characteristics and demonstrate relevance in both national and international contexts.

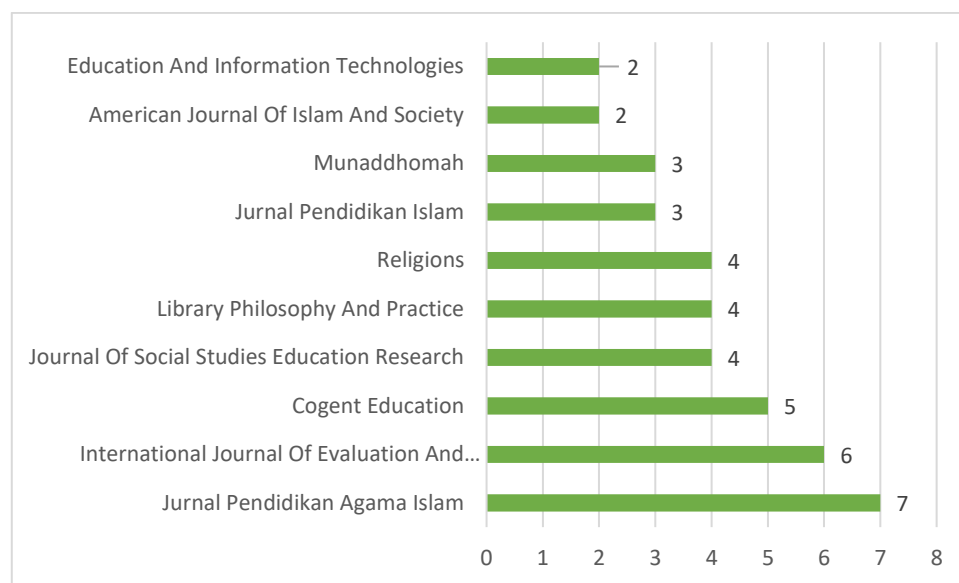


Fig.7. Documents by source

Based on the table, the article with the highest number of citations is Soglimani ND (2020) with 47 citations and an average of 11.75 citations per year. On the other hand, the article with the highest average citations per year is Hudaefi FA (2022) with an average of 12.33 per year and 37 citations.

On the other hand, the article with the lowest impact is Sameer MS (2012), which only received 10 citations in more than a decade, with an average of 0.71 citations per year. These findings indicate that newer articles (2022-2023) tend to have higher annual citation rates, reflecting the increasing relevance of the topic in current scientific literature.

Table 2. The 10 most productive resources in digital religious learning research

Paper	Total Citations	TC per Year
Soglimani ND, (2020)	47	11,75
Hudaefi FA, (2022)	37	12,33
Suvaran, (2022)	35	11,67
Khurshid Khan M, (2021)	30	10.00
Veerasamy M, (2023)	27	13.50
Aydin A, (2021)	23	7.67
Hussain I, (2020)	22	5.50
Nawi NM, (2021)	17	5.67
Whyte SR, (2022)	14	4.67
Sameer MS, (2012)	10	0.71

3.2. Network Analysis

Fig. 8 displays a network visualization analysis depicting the frequency of research related to digital technology-based religious education, conducted using VOSviewer software, by identifying 133 articles using a minimum citation limit of 2, and then generating 75 items in four clusters with a minimum cluster size of 10. Each cluster is marked with a different colour. These themes are interrelated and relevant. The first cluster, marked in red, displays the keywords Islamic Education with a total link strength of 38 and occurrence of 16, Islam with a total link strength of 6 and occurrence of 5, and online with a total link strength of 4 and occurrence of 4. These three keywords reinforce the relevance of the religious context and online learning methods.

Cluster 2, coloured green, displays the keywords Islamic religious education with a total link strength of 12 and occurrence of 11, digital era with a total link strength of 10 and occurrence of 6, and digital literacy with a total link strength of 5 and occurrence of 5. From these dominant keywords, there is a theme of innovation and digitalization of learning. Cluster 3, marked in blue, focuses on learning with a total link strength of 23 and occurrence of 3, humans with a total link strength of 23 and occurrence of 2, and controlled studies with a total link strength of 23 and occurrence of 2. These keywords indicate the process of evaluating the effectiveness of digital learning. Cluster 4, marked in yellow, shows digital learning with a total link strength of 10 and occurrence of 7, technology with a total link strength of 8 and occurrence of 5, and social media with a total link strength of 4 and occurrence of 3. These dominant keywords reflect the main focus on the transformation of digital-based religious learning through digital platforms.

Digital transformation facilitates broad access to religious education, enabling effective and interactive learning. Religious education utilizes digital technology that provides a variety of digital learning media, creating many innovations as learning tools, including online learning. Even from the COVID-19 era until now, online learning continues. The digital era equips students with the ability to read, understand, and wisely utilize digital learning media. This is because teachers and students are required to be technologically literate. To be able to optimally utilize digital technology requires good digital literacy. Students become more critical in receiving information and continue to uphold Islamic values amid the tide of globalization [24]. In addition, deepening religious knowledge and disseminating information related to Islam is often linked to the use of social media. Several studies have examined learning innovations that utilize social media, such as YouTube, TikTok, Instagram, and so on. The use of social media has a positive impact and greatly influences the improvement of accessibility, interactivity, and student participation in the learning process. However, there have not been many studies related to the use of social media in Islamic religious education, so further research is needed in this field [25].

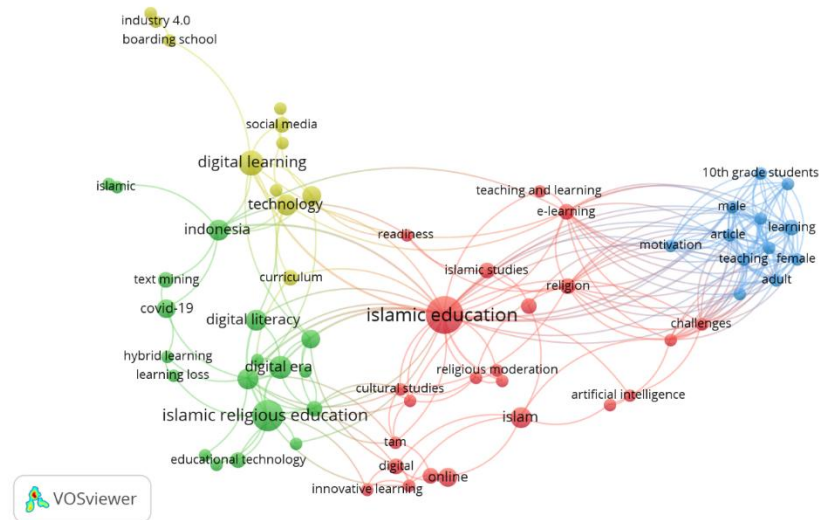


Fig.8. Network visualization of digital-based religious learning topics

Fig. 9 illustrates a keyword network analysis based on time. Keywords or dominant themes are marked with colours. Dark blue indicates themes relevant to the early period, turquoise indicates themes relevant to the middle period, and yellow indicates newly emerging themes. The dark blue theme with the keywords technology, learning innovation, and e-learning has been used for a longer period, around 2020. This theme indicates the early period of innovation in digital technology-based religious learning, which developed significantly, driven by the COVID-19 pandemic. Meanwhile, the green and yellow themes represent relatively new keywords such as digital learning, Islamic education, hybrid learning, and artificial intelligence, which emerged around 2022 and are still relevant until 2025. Technological developments and innovations in digital learning support more adaptive, interactive, and contextual learning in line with the needs of the times by utilizing internet technology as a source and medium of learning.

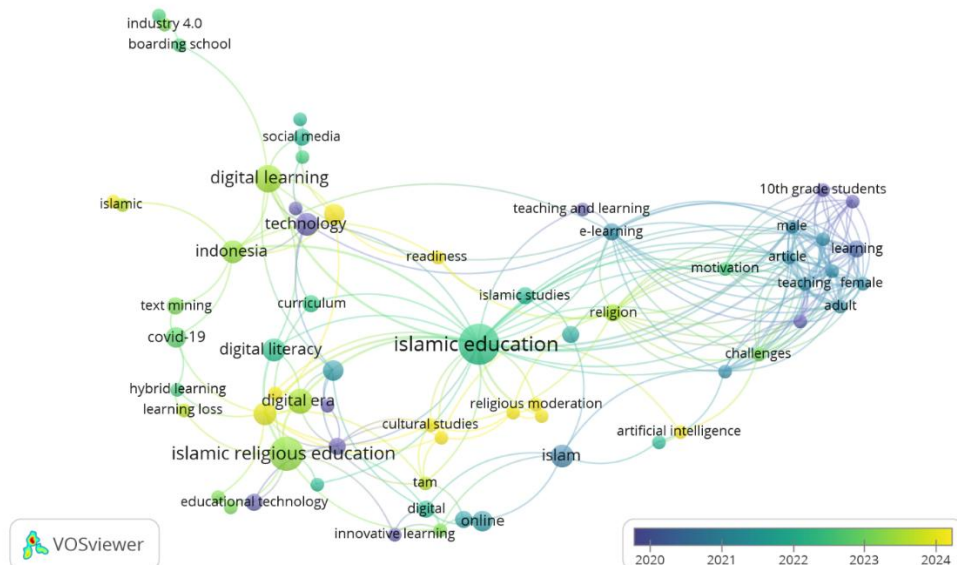


Fig.9. Topic Network Distribution of Digital-based Religious Learning Based on Overlay

Based on thematic analysis, the motoric themes located in the upper right quadrant include Islamic education, higher education, and the digital era. These themes indicate significant developments in this field of research, marked by shifts in religious education systems, particularly in

higher education, which increasingly relies on digital technology in the learning process. These themes are highly relevant and can contribute greatly to scientific progress.

On the other hand, there are basic themes that are quite relevant, but their development is less than optimal. In the lower right quadrant, Basic Themes include digital literacy, Islamic religious education, and Islamic boarding schools. These themes show a high level of relevance, but their development is still limited. Nevertheless, these themes have the potential to be a starting point for building a more in-depth research framework.

In the upper left quadrant, Niche Themes include digital transformation, challenges, and machine learning. These themes show potential for innovation in technology-based approaches to religious education, although they are not yet mainstream in the literature. The use of advanced technologies such as machine learning and educational game applications is still contextual and limited. This theme is suitable for research that explores details and provides opportunities for in-depth technical research.

Emerging or declining themes, on the other hand, are located in the lower left quadrant and include information and communication technology, educational games, and text mining. These themes tend to have low centrality and density in the research network, indicating weak connections to the main themes and a lack of research continuity. Therefore, despite their current weak position, these themes offer great opportunities to address research gaps and can be further developed as new directions for future research in exploring technology integration, particularly in relation to technological innovation and pedagogical approaches relevant to religious contexts.

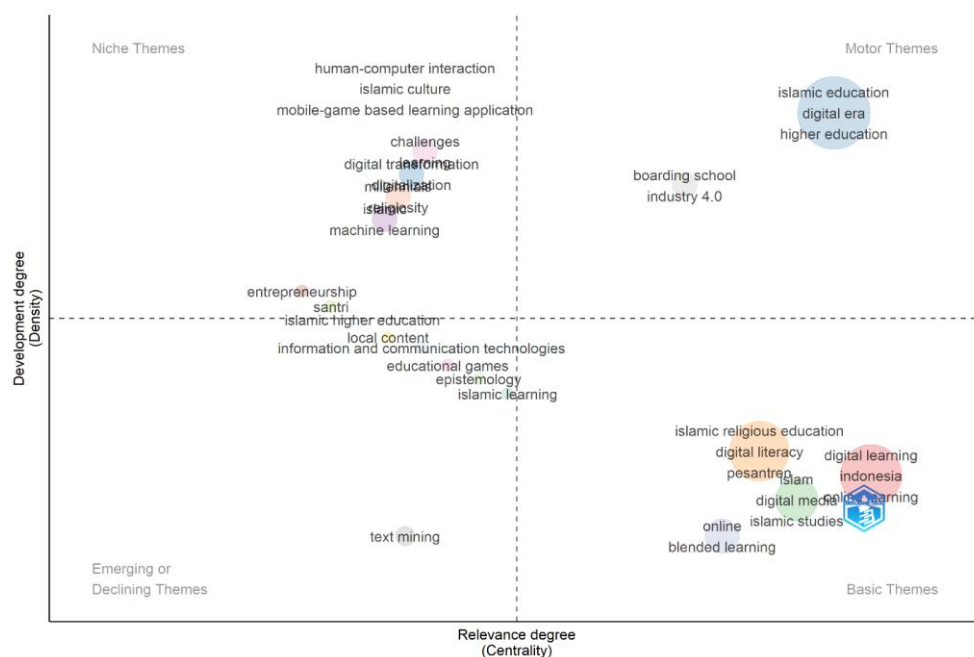


Fig.10. Thematic mapping of technology-based religious learning publications

Based on thematic topics, several of the listed themes show significant increases in the number of publications, including Islamic education, higher education, and the digital era. Themes with high publication rates indicate that the topics are highly relevant to global and local issues, resulting in high collaboration rates. Relevant themes generally become the focus of the scientific community because they have theoretical and practical impacts, thus attracting many researchers to conduct further studies.

There are also relevant themes that need to be researched, including educational games, Islamic education, and machine learning. Although these themes show low publication rates, they open up opportunities for researchers to conduct more in-depth exploration. Based on the above theme mapping, it is possible to identify the direction, potential, and research opportunities that need to be filled in the future.

4. Conclusion

The results of bibliometric analysis related to digital technology-based religious learning show a very significant research trend, especially in the 2020-2025 period. The highest contribution occurred in 2024 with 35 publications. The country with the highest contribution was Indonesia, while Malaysia was the country with the highest inter-country collaboration. The factors driving research development in this field are technological advances, easy access to digital devices, and learning innovations. The increase in the number of publications reflects the effectiveness of digital technology integration in religious education.

Based on an analysis of the authors' documents and institutional affiliations, there are contributions with a high level of collaboration. This shows that the presence of leading universities and institutions that contribute dominantly indicates the development of exploration of digital technology-based religious learning, thus becoming a strong indicator of research topics at the academic level. Furthermore, the high level of collaboration between authors and institutions indicates cross-disciplinary knowledge exchange, which further enriches the insights and approaches in this research.

Based on thematic analysis, it can be seen that themes such as digital learning, mobile game-based learning applications, and Islamic education frequently appear in the literature. This reflects that the main focus of the research is how digital technology can be effectively integrated into religious education. Furthermore, themes such as challenges, the digital era, and Islamic boarding schools are increasingly being researched, indicating a growing trend in exploring various challenges in the process of integrating digital technology into religious education, in order to create solutions to support progressive digital technology-based religious education. The impact of digital technology integration in religious education, both cognitively and morally, will remain a topic that requires further exploration.

Overall, the results of this bibliometric analysis show that, in line with the development of digital technology, the process of integrating digital technology into religious education is increasingly being emphasized for further exploration. With the increase in this research, it will have a significant impact on the development of more interactive religious learning innovations that are relevant to the needs of the times, as well as opening up opportunities for collaboration to enrich interdisciplinary scientific literature, thereby contributing to providing strategic references for educational institutions to formulate learning development policies and assisting academics in preparing further research.

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