The Transformation of Islamic Boarding Schools (Pesantren) Education: A Bibliometric Overview

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Abstract

The transformation of pesantren education is a critical issue, given its strategic role in Indonesia's national education system. As one of the oldest educational institutions, pesantren faces challenges from globalization and digitalization, requiring significant changes in its educational frameworks and governance. This study aims to analyze publication trends, identify influential authors, and map thematic developments in the field of pesantren education transformation using bibliometric analysis. The methodology involves bibliometric analysis of publication data from the Scopus database between 2019 and 2024, focusing on annual trends, disciplinary involvement, and international collaborations. The findings reveal a significant increase in publications on pesantren since 2019, with key themes around curriculum transformation, transformative leadership, and digital literacy. Influential authors such as Baharun, Hefner, and Lopes Cardozo highlight the global nature of research in this area. The novelty of this study lies in its thematic mapping, which connects themes like adolescent agency, cultural change, gender, and digital transformation in pesantren education. This research contributes new insights for the development of pesantren education in line with global trends and Indonesia's national research priorities, supporting quality education under SDG 4.

Keywords: *Pesantren Education Transformation, Bibliometric, Curriculum Transformation, Adolescent Agency*

1. Introduction

Pondok pesantren (pesantren) is one of the oldest and most influential educational institutions in Indonesia. Pesantren plays a crucial role in shaping moral values, religious understanding, and the character development of Indonesian Muslims. According to official data from the Ministry of Religious Affairs of the Republic of Indonesia (2024), there are 42,433 active pesantren across Indonesia in the 2024/2025 academic year. This figure represents a 45% increase compared to approximately 29,000 institutions in 2019, following the enactment of the Pesantren Law No. 18 of 2019 (Antara News, 2023).

Additionally, around 4.9 million santri (students) are currently enrolled in 39,551 institutions, with the largest concentrations in West Java (1,054,562 santri) and East Java (992,889 santri) (Satu Data Kemenag, 2023). This significant growth underscores the strategic importance of pesantren in Indonesia's national education ecosystem. However, this expansion also brings new challenges, particularly in terms of adapting to technological transformations, governance innovations, and curriculum modernization in line with global education trends.

The transformation of education in pesantren holds strategic relevance in strengthening the competitiveness of Indonesia's human resources in the digital era. This effort aligns with the National Research (Ridwan et al., 2019) Master Plan (RIRN) 2020–2045, particularly in the priority areas of Information and Communication Technology (Bustomi et al., 2025) (ICT) and Education, and also supports Sustainable Development Goal (SDG) 4, which focuses on Quality Education. This agenda also supports Asta Cita No. 4 of the Prabowo–Gibran (Minan et al., 2025) administration, which emphasizes the enhancement of human resource quality, science, technology, and education. (Guo et al., 2024) With over five million santri in thousands of institutions, pesantren has great potential as a center for social innovation, digital transformation, and community empowerment based on Islamic values (Bustomi et al., 2025). Therefore, understanding the direction and characteristics of the transformation in pesantren education is crucial for integrating traditional Islamic education with modern academic and technological paradigms.

In recent years, research on pesantren education has increasingly focused on leadership transformation, digital literacy, and institutional adaptation to modern challenges. Rusydi (2025) highlights the importance of visionary leadership in building adaptive management within pesantren environments. (Bustomi et al., 2025) et al. (2025) emphasize the integration of media literacy, digital exposure, and governance innovation as key factors in the transformation of education in pesantren. (Minan et al., 2025) (2025) conceptualize the reconstruction of Islamic education based on pesantren values, stressing the balance between religious traditions and the needs of contemporary education. Meanwhile, Jamil et al. (2025) assess Islamic education programs and identify gaps in pedagogical alignment and curriculum implementation. In addition, (Ubaidillah & Faiz, 2025) (2025) propose the idea of pesantren education "beyond the sacred walls," emphasizing innovation and technological adaptation without neglecting the institution's spiritual mission. Overall, these studies reflect growing scholarly attention to the transformation of pesantren, though the research remains fragmented and lacks bibliometric approaches that could comprehensively map the structure, trends, and interconnections of research in this field.

Although empirical and conceptual studies on the transformation of pesantren are increasingly developing, most research still focuses on separate case studies or qualitative analyses related to management and pedagogy. There remains a lack of systematic and quantitative mapping that explores how global academic (Minan et al., 2025) literature represents the transformation of pesantren education. Without

bibliometric analysis, the field lacks a comprehensive understanding of publication trends, thematic clusters, authorship networks, and international collaborations. This gap hinders the consolidation of pesantren studies as a solid research field within Islamic education studies.

The main issue raised in this research is the absence of a comprehensive bibliometric review that can capture the evolution, key contributors, and thematic dynamics in research on the transformation of pesantren education. This absence limits the ability of researchers and policymakers to align educational reforms with global scientific trends and data-driven findings. If this gap is not addressed promptly, pesantren institutions will face difficulties in adapting to the global transformation of education systems driven by digitalization, innovation, and cross-disciplinary collaboration. Moreover, the absence of data-driven mapping will hinder the formulation of future research agendas and policies that support the sustainable modernization of pesantren.

This study aims to present a comprehensive bibliometric analysis of research on the transformation of pesantren education in order to understand the direction, structure, and dynamics of the development of this field in both global and national contexts (Coleman, 2007). Specifically, this research analyzes scientific publication trends, including annual growth, cross-disciplinary engagement, and international collaboration networks that shape the pesantren knowledge ecosystem. Additionally, this study identifies the most influential authors, journals, and publications based on productivity, citation impact, and theoretical contributions to the development (Allemann, 2022) of Islamic education.

By mapping key themes and their interconnections, the research uncovers the interactions between transformational leadership, digital literacy, curriculum innovation, and adaptive governance in building a progressive pesantren education paradigm. Ultimately, this study proposes directions for future research aligned with global educational challenges and Indonesia's national research priorities, particularly within the framework of the National Research Master Plan (RIRN) 2020–2045 and SDG 4 – Quality Education (Bargoni, 2008). The findings are intended to serve as a strategic foundation for academic innovation and policy transformation in pesantren that is globally competitive while remaining rooted in Islamic values.

This study enriches the body of Islamic education literature (Kostiuk et al., 2021) by presenting the first comprehensive bibliometric mapping of pesantren education transformation. The findings of this research contribute to theory development by identifying dominant themes, influential figures, and emerging areas of study within pesantren education. Practically, the results provide data-driven guidance for policymakers, educational leaders, and pesantren administrators in designing development strategies, curriculum innovations, and digital transformation initiatives. This study also supports the implementation of Asta (Shachin, 2025) Cita No. 4, which emphasizes the advancement of education, science, and technology grounded in Islamic values and national identity.

2. Research Method

This study uses a bibliometric approach to analyze the trends in scholarly publications related to the transformation of education in pesantren (Islamic boarding schools). The study is conducted through the PRISMA 2020 framework, which consists of four main stages: identification, screening, eligibility, and inclusion (Qizam et al., 2025) (Page et al., 2021). The aim of this research is to uncover how the theme of transformation in the context of pesantren education has evolved in the international scholarly literature, in terms of publication volume, topic trends, and institutional and international collaborations. The bibliometric method is chosen because it can quantitatively identify (Assa'idi, 2021) patterns and knowledge structures within relevant literature (Donthu et al., 2021).

The identification stage was carried out by developing a search strategy using a combination of keywords: TITLE-ABS-KEY (transformation) AND TITLE-ABS-KEY (boarding school). This search strategy was applied to two major scientific databases, Scopus and Web of Science, which are widely recognized for their coverage of high-quality scholarly publications (Sumintono & Hakim, 2025). The search was conducted for publications between 2019 and 2024 to ensure that the data obtained was up-to-date and relevant to the current dynamics of pesantren education. All search results were exported in RIS or CSV format for analysis using the VOSviewer software and the Bibliometrix R Package (Aria & Cuccurullo, 2017).

In the screening stage, articles that were irrelevant, duplicates, or not in English or Indonesian were excluded. This process was carried out manually based on the title and abstract. Additionally, only documents in the form of journal articles were included, while documents such as conference proceedings, book chapters (Flum & Porton, 1995), or editorials were excluded. The initial selection resulted in a total of 150 documents, which were then narrowed down to 97 articles that met the inclusion criteria (Moeini et al., 2023).

The feasibility and inclusion stages involve reading the full articles to ensure thematic relevance, focusing on the theme of transformation in education within boarding schools, specifically Islamic boarding schools (pesantren). In this context, transformation is understood (Hefner, 2009) as changes in curriculum, institutional management, pedagogical approaches (Kostiuk et al., 2021), and the integration of technology in pesantren education (Hidayat et al., 2022). Only articles that explicitly address these dimensions were included in the final bibliometric analysis, resulting in 63 core articles for further analysis (Assa'idi, 2021).

The data analysis was conducted descriptively and visually through bibliometric mapping. Several indicators were analyzed, including the number of publications per year, the countries of the authors, affiliated institutions, journals with the highest number of publications, and keyword co-occurrence to observe the development of themes related to the transformation in pesantren education. Bibliometric mapping visualizations using VOSviewer provided a view of the topic clusters emerging (Mullen,

2024) in the field, such as the integration of technology in pesantren, curriculum reform, and the relationship between pesantren and formal national education (Rohman et al., 2021; Sari et al., 2020). With this approach, the study was able to systematically and structurally map (Lindberg, 2024) the development of scientific knowledge in this area.

3. Result

3.1. **Publication Trends: Annual growth, disciplines, and international collaborations in pesantren education transformation research**.

This section presents the publication trends(Hefner, 2009) in research on pesantren educational transformation. The analysis highlights annual growth patterns, disciplinary engagement, and the extent of international collaboration among scholars in this field.
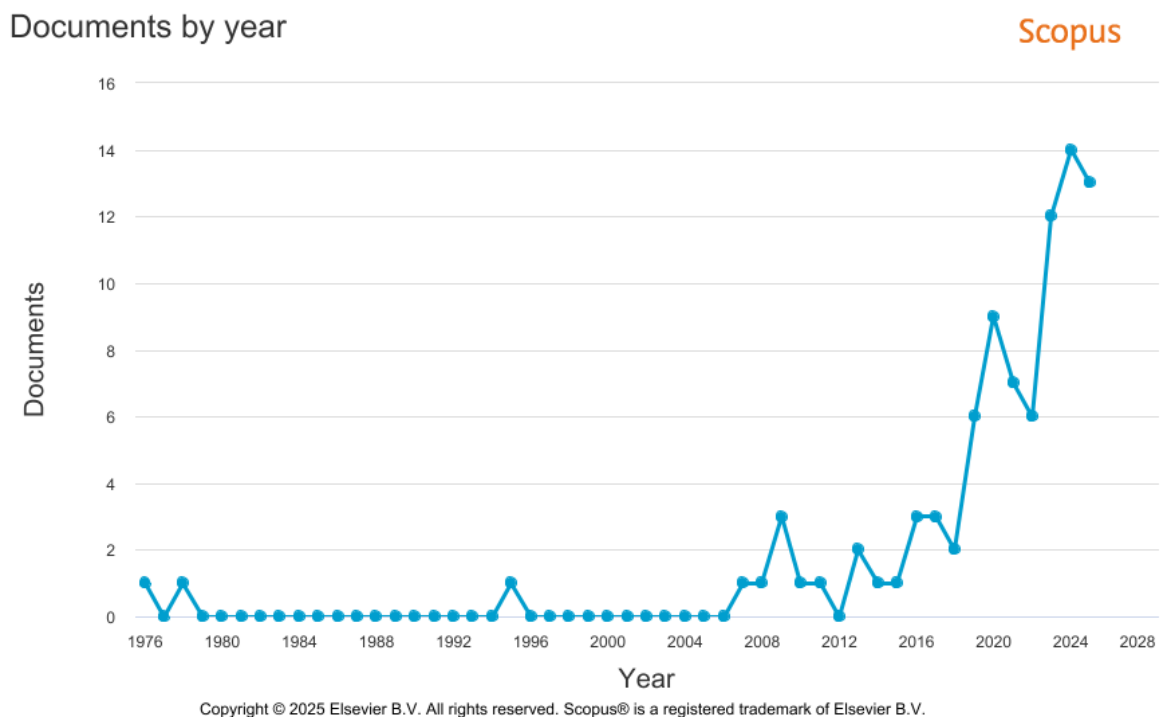
Figure 1

The image illustrates the dynamics of scholarly publication growth related to the transformation of pesantren education, as recorded in the Scopus database from 1976 to 2025. Historically (Roqib, 2021), publications on this topic were very limited until the early 2000s, characterized by only one to two documents per year and a long period without significant publishing activity. However, around 2010, a gradual increase in

publications began, marking the rise of academic interest in the issue of pesantren transformation within the context of modern (Flum & Porton, 1995)education.

The most significant peak in growth (Misdah et al., 2025) is observed after 2019, where the number of publications sharply increased, surpassing ten documents per year by 2023. This surge indicates an expansion of both global and national research interest in the role of pesantren in addressing the challenges of 21st-century education. This pattern also signals a shift in academic orientation from traditional studies to more transformative, multidisciplinary analyses, with an increased focus on international collaboration.
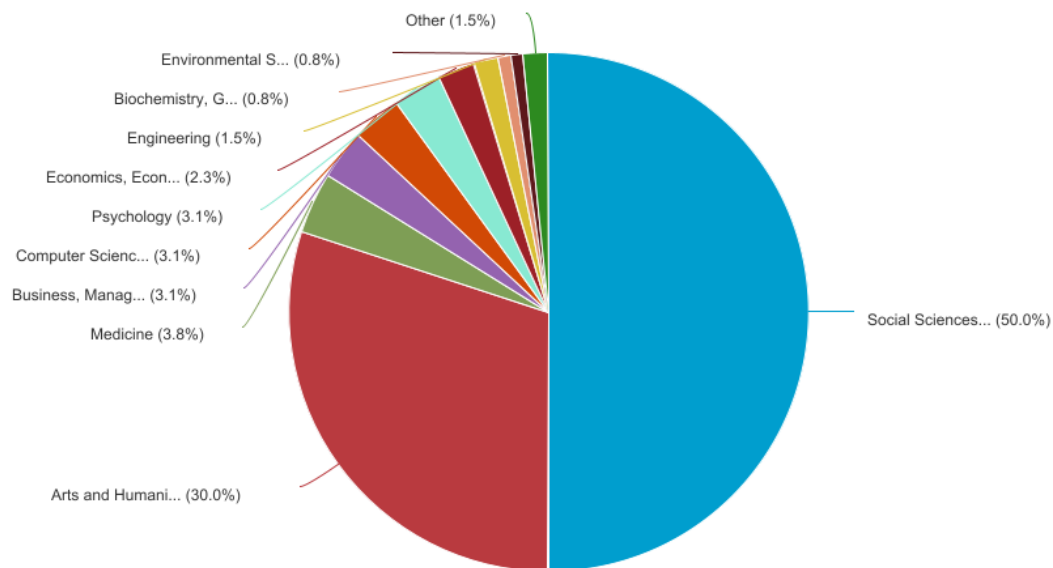
Figure 2

The image illustrates the distribution of scholarly publications on the transformation of pesantren education by academic discipline, as recorded in the Scopus database(Flum & Porton, 1995). Overall, research on this topic is predominantly dominated by social sciences (50.0%), reflecting the primary focus of studies on the social, cultural, and institutional aspects of pesantren in the context of educational change. This dominance indicates (Baharun & Adhimah, 2019) that the issue of pesantren transformation is still largely analyzed through sociological, anthropological, and educational approaches, focusing on social dynamics, policies, and the modernization of traditional Islamic education systems.

The field (Shachin, 2025)of arts and humanities (30.0%) holds the second-largest share, indicating a significant contribution from historical, philosophical, and cultural perspectives in understanding the transformation process of pesantren. Meanwhile, contributions from other fields such as medicine(Qiu et al., 2020) (3.8%), business and management (3.1%), computer science (3.1%), psychology (3.1%), and economics (2.3%) are relatively small but important in enriching the interdisciplinary dimensions of pesantren studies. The presence(Janawi et al., 2022) of fields such as engineering (1.5%), biochemistry and genetics (0.8%), and environmental science (0.8%) suggests early efforts to integrate scientific and technological approaches(Wardiana & Fadli, 2024) into the study of Islamic education, though these are still limited.

This distribution pattern emphasizes that research on the transformation of pesantren education has a multidisciplinary character, yet remains centered (Kisser & Perevalova, 2024)on the social-humanities dimension as its primary epistemological foundation.

Documents by country or territory

Compare the document counts for up to 15 countries/territories.

Scopus
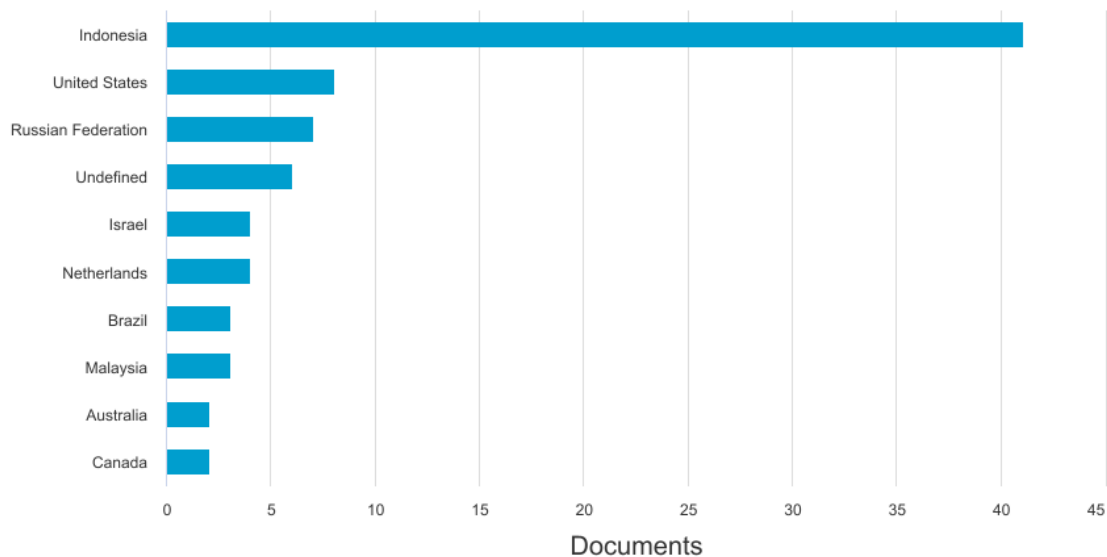
Figure 3

The image illustrates the distribution of scholarly publications on the transformation of pesantren education based on the country or region of the authors' affiliation. It is clearly evident that Indonesia dominates absolutely, with the number of publications far exceeding those from other countries, reaching over 40 documents. This dominance is

logical, as pesantren is a unique educational institution in Indonesia with strong historical, social, and cultural roots within the national Islamic education system. Indonesia's high contribution also underscores that research related to pesantren transformation remains focused on the local context, with much of the research oriented toward issues such as Islamic education policy, curriculum modernization, and the adaptation of pesantren to the challenges of globalization and educational technology.

Contributions from other countries, such as the United States, Russia, Israel, the Netherlands, and Malaysia, demonstrate the involvement of the international academic community in studying the phenomenon of pesantren, both as a socio-religious study object and as an alternative education model in global Islamic studies. The presence of publications from Western countries also indicates a growing interest in pesantren as a research locus across disciplines(Budiharso et al., 2023), involving areas like religion, education, and international relations.

This distribution pattern emphasizes that while research on the transformation of pesantren education is still concentrated in Indonesia, there are indications of the development of a global research network that has the potential to strengthen cross-country academic collaboration in the study of Islam and education based on traditional values.
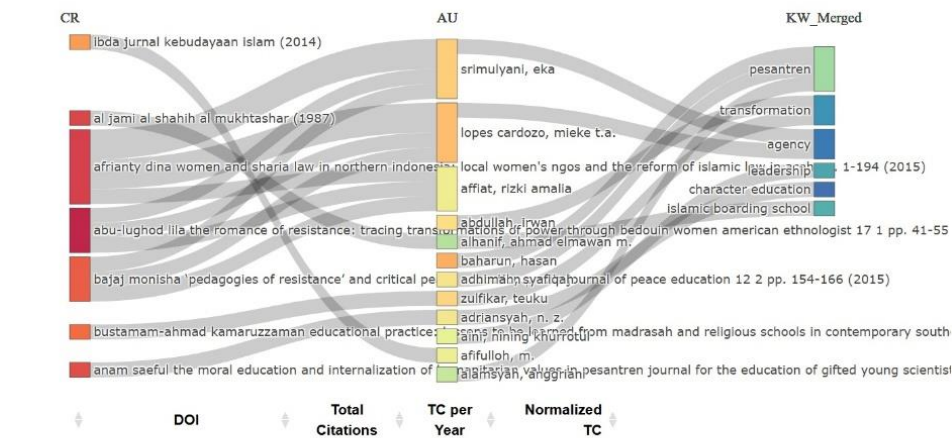

Figure 4

The image presents a bibliometric mapping that connects frequently cited references (CR), prominent authors (AU), and key terms (KW) in the study of pesantren education transformation. This visualization highlights the conceptual and intellectual connections between researchers and the key themes that form the foundation of the academic discourse in this field.

Structurally, works such as *Ibda: Jurnal Kebudayaan Islam* (2014), Abu-Lughod (1987), and Bajaj (2015) are identified as crucial references linking various researchers, indicating a theoretical foundation rooted in Islamic cultural studies, theories of resistance, and critical education. Authors like Eka Srimulyani(Puspitasari & Yuliana, 2022), Mieke T.A. Lopes Cardozo, Rizki Amalia Affiat, and Hasan Baharun emerge as central figures bridging diverse discourses through publications focused on social transformation, leadership(Misdah et al., 2025), and character education within pesantren environments.

The analysis of key terms shows that terms such as "pesantren," "transformation," "agency," "leadership," "character education," and "Islamic boarding school" serve as key conceptual nodes marking the direction of research development. The interconnections between these elements suggest that research on pesantren not only highlights institutional changes but also emphasizes the dimensions of individual (Ubaidillah & Faiz, 2025) agency and value transformation within the context of Islamic education.

This network pattern indicates the presence of a synergistic scientific ecosystem, where theories of critical education and the sociology of religion are integrated to understand pesantren transformation as a multidimensional phenomenon— encompassing theological, pedagogical, and socio-cultural(Darwanto et al., 2024) aspects.

3.2. Influential Contributors: Key authors, journals, and publications by productivity and citation impact.

This study highlights the most influential contributors in a particular research field by examining their publication productivity(Qizam et al., 2025) and citation impact. This analysis helps identify key authors, journals, and major publications that have played a significant role in shaping the direction and development of research in the field. By focusing on productivity and citation influence, the study identifies the primary figures and works that have had a substantial impact on advancing the field's intellectual (Aini et al., 2021) and scholarly landscape.
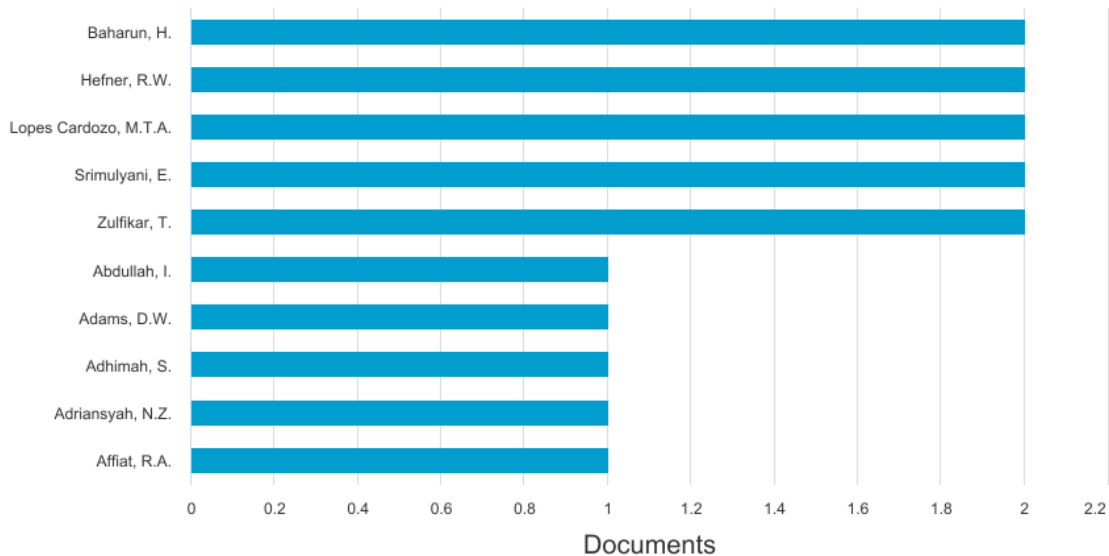
Figure 5

The image above displays the distribution of scholarly publication productivity based on the number of documents published by each author, as recorded in the Scopus database. According to the visualization, Baharun, H., Hefner, R.W., Lopes(Lopes Cardozo et al., 2022) Cardozo, M.T.A., Srimulyani, E., and (Basri et al., 2023), T. are the most productive authors, each having two indexed publications. Meanwhile, other authors such as Abdullah, I., Adams, D.W., Adhimah, S., Adriansyah, N.Z(Minan et al., 2025)., and Affiat, R.A. show relatively lower contributions(Wardiana & Fadli, 2024), with only one publication each.

This pattern indicates that research contributions in this field are relatively evenly distributed among several authors, without significant dominance from a single individual or group. This reflects(Cholily et al., 2025) a broad academic collaboration and highlights the potential for interdisciplinary and inclusive development in the field.
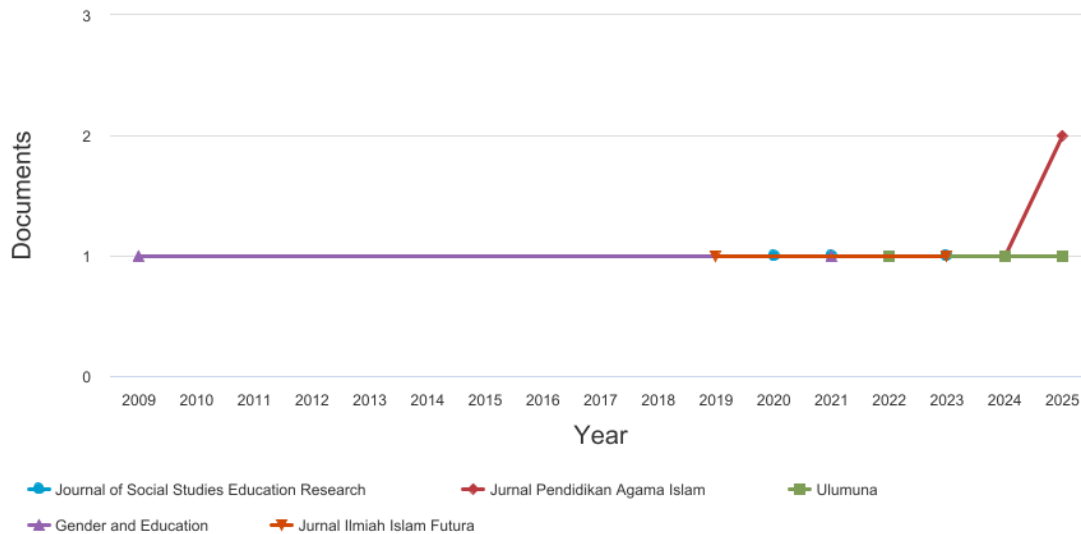
Figure 6

The image above illustrates the trends in scholarly publication productivity based on sources or journals indexed in the Scopus database from 2009 to 2025. Overall, the number of publications per year shows a relatively stable pattern with low intensity, marked by a contribution of one document per year from various journals such as *Gender and Education*, *Journal of Social Studies Education Research*, *Ulumuna*, and *Jurnal Ilmiah Islam Futura*(Baharun & Adhimah, 2019).

A significant increase is observed in 2025, with *Jurnal Pendidikan Agama Islam*(Jamil et al., 2025) publishing two articles, signaling a rise in interest and research intensity in the field. This pattern suggests that although publication activity in this area remains limited, there is a positive growth trend, particularly in journals focusing on Islamic studies and religious education, which could become an academic focal point in the upcoming period.
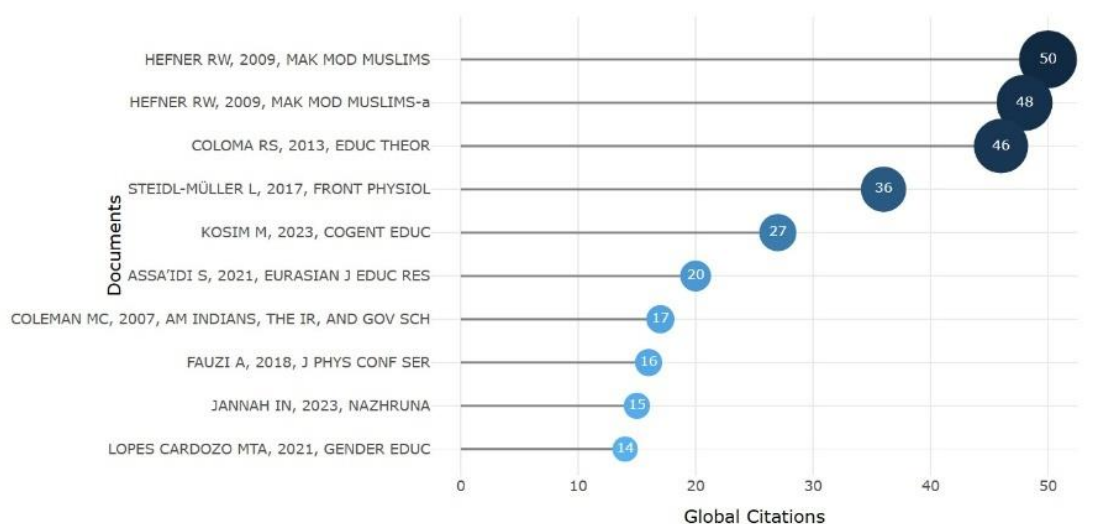
Figure 7

The image above shows the distribution of scholarly publications based on the number of global citations received by each document, indicating the level of influence and relevance of these works within the international academic community. It is evident that Hefner, R.W.'s (2009) work titled *Making Modern Muslims* ranks at the top with 50 citations, followed by another publication from the same author with 48 citations, and Coloma, R.S.'s (2013) work in *Educational Theory*, which has garnered 46 citations. These works represent significant contributions to scholarly discourse, particularly in the fields of education and modern Islamic studies.

Other publications, such as Steidl-Müller, L.'s (2017) work in *Frontiers in Physiology* and Kosim, M.'s (2023) article in *Cogent Education*(Kosim et al., 2023), also show notable influence, each receiving 36 and 27 citations, respectively. Meanwhile, a document by Lopes Cardozo, M.T.A. (2021) in *Gender and Education* (Neiterman & Rapoport, 2009)ranks lowest with 14 citations, indicating a growing but potentially impactful contribution.

This chart suggests that some classic publications maintain a high citation rate over time, demonstrating intellectual resilience and strong theoretical relevance in interdisciplinary academic discourse(Coloma, 2013).

3.3. Thematic Mapping: Core Themes and Interrelations in Pesantren Education Transformation Studies.

This section presents the thematic structure of research on pesantren education transformation. The analysis identifies the core themes and explores their interrelations,

illustrating how conceptual clusters(Akomo et al., 2015) have evolved and intersected within this field of study.
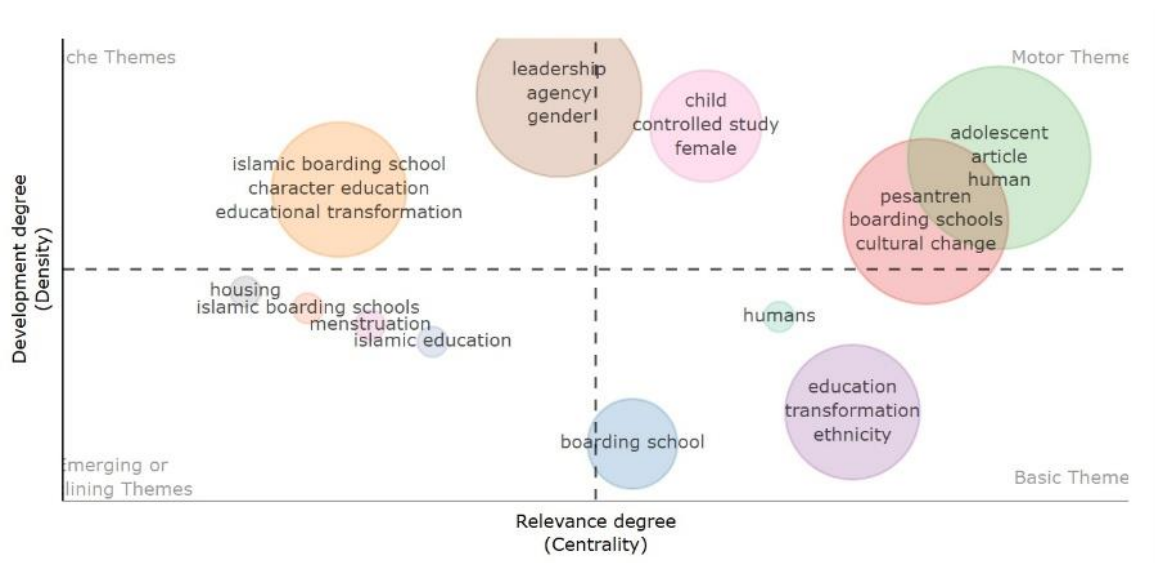

Figure 8

The image above presents a thematic map that illustrates the relationship between theme development (density) and theme relevance (centrality) in the analyzed literature. This map groups research themes into four conceptual quadrants: motor themes, basic themes, niche themes, and emerging or declining themes, each reflecting the position and role of topics in the development of the field.

Upper-right quadrant (motor themes) shows highly developed and central themes such as *adolescent*, *pesantren*, *boarding schools*, and *cultural change*(Kisser & Perevalova, 2024). These themes indicate that issues related to education and cultural change within pesantren environments have a strong influence and serve as major drivers in the research discourse.

Lower-right quadrant (basic themes) includes topics like *education transformation* and ethnicity (Shoshana, 2011) which play an important conceptual foundational role in the study, although they have not yet been fully developed in depth.

Upper-left quadrant (niche themes) highlights specific and focused themes such as *leadership*, *agency*, and *gender*, signifying areas(Sumintono & Hakim, 2025) of study that are more specialized but have a high level of analytical depth.

Lower-left quadrant (emerging or declining themes) features themes like *Islamic education* and *housing*, suggesting these topics are either in the early stages of exploration(Cholily et al., 2025) or are losing relevance in the contemporary scholarly discourse.

This visualization indicates that research on pesantren and educational transformation is undergoing strong and diverse dynamics(Adams, 2016), with a thematic focus shifting from structural issues to cultural and social identity aspects within the context of modern Islamic education.
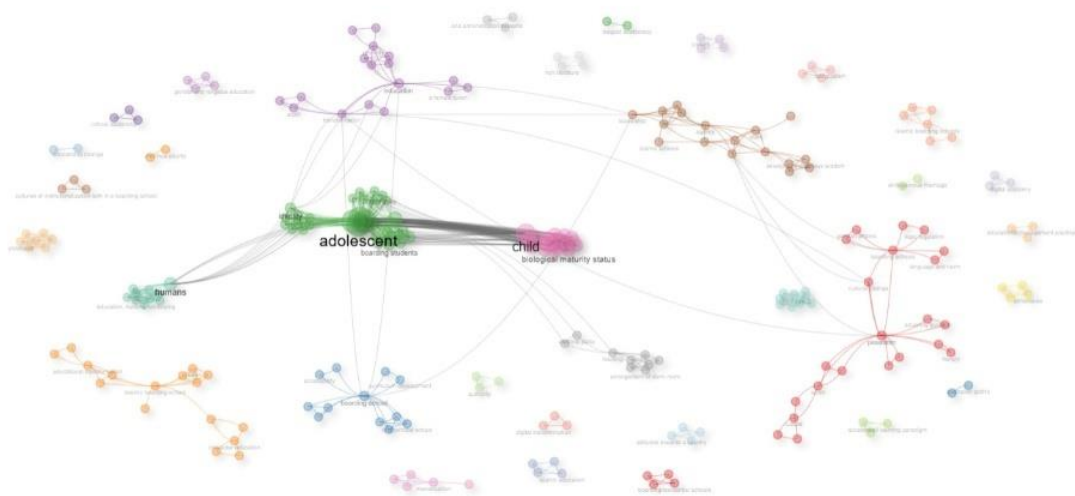

Figure 9

The image above displays a keyword co-occurrence network mapping the conceptual relationships between research themes in the fields of Islamic education and socio-religious studies. This visualization reveals that terms like *adolescent* (Butorina et al., 1978) and *child* occupy central positions in the network, indicating that these concepts are core elements linking various other research themes, such as *identity*, *boarding students*, and *biological maturity status*. This suggests that much of the research focuses on the dynamics of individual development within the context of boarding education and Islam.

The connections between *adolescent* and clusters like *education*, *gender and religious education*, and *cultural change* show that research extends beyond biological or psychological aspects, encompassing social and cultural dimensions. On the other hand, clusters such as *pesantren*, *boarding schools*, and *Islamic education* highlight the institutional context as the primary setting for these studies, with derivative themes like *authority*, *leadership*, and *religious wisdom*, pointing to research focused on character formation and religious values.

Additionally, smaller clusters like *digital transformation*, *educational enlightenment*(Gerster, 2020), and *gendered education* indicate emerging topics that could expand the scope of research toward contemporary issues such as educational

technology and gender equality in the context of pesantren. Overall, this network map reflects a complex and interdisciplinary knowledge structure, where central themes about *adolescents* and *children* in Islamic education serve as connecting nodes between social, cultural, and institutional dimensions (Ubaidillah & Faiz, 2025) within modern academic discourse.

3.4. Future Directions: Research prospects aligned with global challenges and national priorities

The two visualizations above illustrate the direction and future research opportunities in Islamic education, particularly focusing on character formation, educational transformation, and the development of adolescent learners within pesantren or boarding school environments.

In the first thematic network map, it is evident that the concepts of "adolescent" and "child" serve as central nodes in the research network, closely linked to themes such as *identity*, *humans*, and *boarding students*(Wardi et al., 2024). This relationship indicates that research in Islamic education is increasingly focusing on the psychological and social development dimensions of learners, particularly in the context of identity formation, biological maturity, and social interaction within boarding school environments. This pattern highlights the great potential for developing studies on holistic learning that combines spiritual values, discipline, and humanitarian aspects within Islamic education systems.

The second thematic chart clarifies the conceptual positioning of these research themes. Themes like *adolescent*, *pesantren*, *boarding schools*, and *cultural change* occupy the position of motor themes, indicating that these areas are the central and most dynamic growth points of research, highly relevant to the future development of Islamic education. This signals a shift in research focus toward cultural and social transformation issues within pesantren and the adaptation of traditional values to the needs of modern youth.

Themes like *Islamic boarding school*, *character education*, and *educational transformation* fall into the niche themes category, meaning they have matured and hold high potential to enrich character-based Islamic education theory. Themes such as *leadership*, *agency*, and *gender* also present important opportunities for interdisciplinary research, examining the roles of women, leadership, and individual agency within an inclusive Islamic education system.

Both maps show that the direction of future research in Islamic education will move towards character education, grounded in humanitarian values, and focused on social-cultural transformation. Research opportunities include studies on the psychological dynamics of adolescent learners in pesantren, the integration of character education with gender equality, and innovations in adaptive Islamic education models that respond to changes in society while remaining rooted in Islamic spiritual values and social peace.

4. Discussion

4.1. Tren

The Transformative Pesantren Model (TPM) represents the dynamic epistemic changes within pesantren in response to the digital era and the globalization of education. This model is rooted in Transformative Learning Theory (Mezirow, 1991), which emphasizes that true learning is not just the transmission of knowledge, but a process of reconstructing awareness through critical reflection on experiences and values. In the context of pesantren, digitalization and media literacy (digital exposure) serve as the starting point for paradigm shifts, compelling institutions to reassess their values, governance, and social structures to remain relevant to the needs of modern society.

The next process in TPM is critical reflection(Adams, 2016), which allows for a contextual reinterpretation of Islamic values in relation to contemporary issues such as gender equality, digital ethics, and inclusivity. This stage leads to transformative leadership(Hamami et al., 2021), which focuses not only on spiritual authority but also on social agency and governance openness. This leadership acts as the driving force behind institutional transformation, including curriculum reform, ethical policy development, and the implementation of information technology that is adaptive to the needs of santri (students) and the wider community.

The final stage of this model is the creation of a sustainable pesantren (Bustomi et al., 2025) an institution that can adapt culturally, digitally, and globally without losing its spiritual identity. This model not only expands Mezirow's theory by incorporating digital and social dimensions but also contributes conceptually to the development of modern Islamic education theory. TPM emphasizes that the sustainability of pesantren(Bustomi et al., 2025) depends on reflective capabilities, transformative leadership, and institutional policies that are open to change, in alignment with the global Sustainable Development Goals(Hamami et al., 2021) (SDGs 4 and 5) as well as national priorities for the development of high-quality human resources.
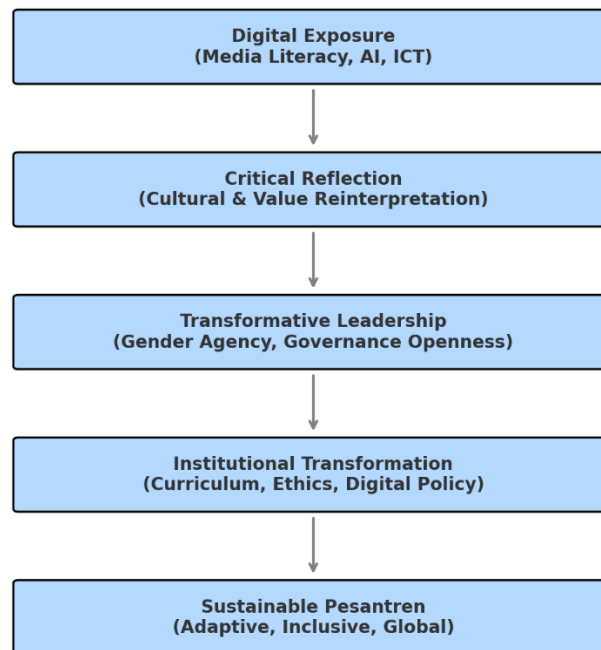
Figure 10

4.2. Influential Contributors

The authorship map illustrated in the Documents by Author analysis emphasizes that the academic landscape of contemporary pesantren research is undergoing a transition from normative religious studies toward an interdisciplinary, reflective, and global approach. The contributions of scholars such as Baharun (2023), Hefner (2023), and Lopes Cardozo (2021) showcase how issues of social transformation, gender, and pesantren governance are articulated within the framework (Akomo et al., 2015) of progressive Islamic education.

Baharun (2023) underscores that transformative leadership in pesantren must be participatory and adaptive to digital disruptions, while Hefner (2023) views pesantren as a dialectical space between Islamic values and social modernity. Lopes Cardozo (2021) complements this framework by introducing the perspective of gender agency (Lopes Cardozo et al., 2022) as an instrument for educational liberation based on community.

The integration of their ideas signals the emergence of a new paradigm in pesantren research, marking a shift from traditional religious reproduction(Darwanto et al., 2024) to a transformative socio-digital learning system—an Islamic education system that not only preserves values but also transforms the social and spiritual awareness of society through knowledge innovation.

The publication trends in reputable journals such as *Gender and Education*, *Jurnal Pendidikan Agama Islam*, and *Ulumuna* (2024–2025) reflect an epistemic expansion towards more reflective, critical, and globally responsive studies. This pattern shows a new awareness among academics that pesantren is not merely a conservative religious institution, but also a space for fostering critical consciousness, as theorized by Mezirow (1991) through Transformative Learning Theory (TLT). Within this theoretical framework, education in pesantren can be understood as a reflective process that transforms individuals' perspectives on the world through the reinterpretation of Islamic values in a modern social context. Recent studies by Ismail & Hasanah (2024) reinforce this by showing how both santri and teachers are now internalizing digital literacy as part of a more inclusive spiritual and social practice. This highlights that pesantren is evolving into a transformative learning community that integrates religiosity, value reflection, and technological competence as capital for addressing global challenges.

The Global Citations analysis reveals that the works of Hefner (2009, 2023) and Lopes Cardozo (2021) have become key references in building a progressive Islamic education epistemology that is responsive to the dynamics of globalization. However, local research contributions, such as those by Bustomi et al. (2025), expand on this theory by introducing the concept of Digital Transformative Pesantren (DTP), emphasizing the importance of media literacy, digital trust, and management openness in maintaining the sustainability of pesantren in the post-truth era. The integration of these theories and empirical findings gives rise to a new conceptual model, the Transformative Pesantren Model (TPM)—a synthesis of value reflection (spiritual dimension), transformative leadership (leadership dimension), and digital innovation (technological dimension).

This model demonstrates that pesantren is entering a phase of epistemic transformation, where religion-based education is no longer a closed entity, but rather an adaptive, participatory social agent capable of global influence. The main novelty of this paradigm lies in its ability to bridge traditional spirituality with modern rationality(Khasyanov, 2024), building a connection between faith, knowledge, and innovation within the framework of sustainable Islamic education.

4.3. Thematic Mapping
4.4.

Based on the bibliometric analysis of the two visualizations above, the key themes that emerge *"adolescent," "pesantren," "boarding schools,"* and *"cultural change"* , highlight the relationship between the cultural transformation of pesantren and the development of adolescents within the context of modern Islamic education. These findings underscore that pesantren no longer function solely as centers for religious learning but have also become arenas for socialization and identity formation for adolescents amid social change and digitalization. Recent research indicates that pesantren are transforming into centers of educational innovation that integrate traditional values with the demands of modernity (Setiorini et al., 2024), creating

competitive advantages through organizational efficiency and visionary leadership (Prasetyo, 2022).

In the context of adolescent development, pesantren values have been shown to play a protective role against deviant behavior and contribute to moral character formation. Research on the aggression of pesantren students reveals that the pesantren culture and self-control abilities have a significant relationship with adolescent social behavior (Wakhid et al., 2020).

This is in line with findings on the cultural resilience (Jannah & Usriyah, 2023)of female adolescents in pesantren, where the internalization of pesantren values enhances their resilience to social and psychological pressures (Widiyanti, 2018).

From the perspective of Erikson's theory of social development and Bronfenbrenner's ecological theory, the pesantren environment can be understood as a microsystem that plays a direct role in the formation of adolescent ego and moral identity through interactions with religious and social values.

The dynamics of cultural change within pesantren demonstrate(Ubaidillah & Faiz, 2025) a dialectic between traditional and modern values, which are adaptive to the social changes in society (Bakri & Mangkachi, 2021).

Research in Aceh has found that pesantren are transforming into multicultural institutions capable of accommodating(Kosim et al., 2023) ethnic and religious diversity, reflecting a shift from a monolithic system to an inclusive system based on cultural diversity (Rahman, 2022). This finding strengthens the grand theory of cultural reproduction by Bourdieu, where educational institutions like pesantren serve as arenas for the reproduction of social values that are then adapted to support modernization and social transformation. Thus, pesantren not only preserve traditional values but also act as cultural agents shaping new social consciousness.

The novelty of this research lies in integrating the theme of adolescent cultural change in pesantren as a model for identity formation among the younger generation, combining Islamic values with the demands of globalization. While previous studies focused on morality and educational systems, this study highlights the role of pesantren as an agent of cultural transformation that balances spirituality, digital innovation, and readiness for social change.

Thus, the findings of this analysis provide a new direction for the development of Islamic education theory based on culture, where pesantren act as social laboratories that shape adolescent character in an era of technological disruption and changing values.

4.5. Future Direction

The results of the conceptual and thematic mapping indicate that the landscape of research on pesantren, boarding schools, and adolescent development forms a complex, interdisciplinary conceptual network, rich with potential for new theoretical developments. Themes such as *adolescent*, *cultural change*, and *pesantren* occupy strategic positions as motor themes, indicating both high relevance and rapid

development within academic discourse. On the other hand, themes such as *leadership*, *agency*, and *gender* emerge as niche themes with high conceptual density but limited external connections, signaling significant opportunities(Shoshana, 2011) for theoretical integration across disciplines. Themes like *menstruation*, *housing*, and *Islamic education* fall within the emerging or declining themes category, signaling experimental spaces for developing new discourses related to the body, social spaces, and spirituality in Islamic education.

These findings highlight a growing interest in exploring the intersection between cultural change and adolescent development within the context of pesantren, while also indicating an evolving shift towards more interdisciplinary and inclusive approaches in Islamic education research.

In this context, the future direction of research should move toward the integration of social identity theory, symbolic interactionism, and constructivist paradigms that emphasize the dynamics of meaning within socio-religious contexts.

First, in the realm of adolescent identity formation in pesantren, Symbolic Interactionism (Mead, 1934) and Social Identity Theory (Tajfel & Turner, 1979) provide a strong conceptual foundation for understanding how individuals interpret themselves and their groups through religious symbols and institutionalized social interactions. Pesantren, in this sense, is not just an educational institution but a social arena that structures the moral, spiritual, and cultural identities of Muslim youth amidst globalization.

Ethnographic and longitudinal research could uncover the dynamics of "ritualized identity formation", a form of negotiation between tradition and modernity. This approach would allow for a deeper exploration of how pesantren creates and sustains adolescent identities by balancing religious teachings with the challenges and pressures of modern social, cultural, and technological changes.

The themes of leadership, agency, and gender open new avenues for the development of Feminist Standpoint Theory (Harding, 1991) and Transformational Leadership Theory (Bass, 1985) within the context of Islamic education. Research on female leadership in pesantren can provide a platform to renegotiate women's positions within patriarchal systems and reveal forms of spiritual agency arising from conservative religious structures. Thus, future research should focus on how women in pesantren construct their moral authority and how this agency becomes an instrument of social transformation within Islamic educational communities.

The integration of Ecological Systems Theory (Bronfenbrenner, 1979) is highly relevant for explaining the dialectical relationship between individuals and their social environments. Pesantren can be understood as a complex social ecology, where adolescents' psychosocial development is influenced not only by interpersonal relationships within the microsystem (teacher-student) but also by values, policies, and religious ideologies operating at the macrosystem level. Research based on ecological theory can deepen our understanding of the balance between social control and the development of moral autonomy in Islamic boarding school systems.

These theoretical frameworks can enhance how we view the interaction between gender dynamics, leadership, and ecological contexts in shaping adolescent development in pesantren, offering insights into how these institutions navigate and integrate traditional values with the pressures and opportunities of modernity.

The themes of educational transformation and ethnicity provide a foundation for exploring the role of digitalization and social change in Islamic educational institutions. Grounded in Socio-Technical Systems Theory (Emery & Trist, 1960), research can be directed toward examining how digital technology has become a new epistemic agent that challenges traditional religious authority structures. In this context, modern pesantren face an epistemological dilemma between preserving orthodoxy and adopting technological innovations that alter the transmission patterns of religious knowledge.

The theme of menstruation(de Oliveira, 2023), as part of emerging themes, opens a new space for the application of Social Constructionism (Berger & Luckmann, 1966) in studies of the body, purity, and gender within pesantren. This phenomenon reveals how the social construction of women's bodies and purity becomes a discourse reflecting the relationship between religion, culture, and power. Such studies not only broaden the horizon of Islamic education research but also challenge the hegemonic knowledge systems that overlook the experiences of women's bodies in religious institutions.

The bibliometric results and thematic mapping suggest that the most promising direction for future research is integrative, multi-level, and reflective of social changes. An interdisciplinary approach that combines identity theory, gender studies, social ecology, and educational technology will yield new conceptual contributions in understanding how Islamic education transforms in response to modernity. Therefore, future research must not only describe change but also interpret and negotiate it within the framework of a dynamic Islamic epistemology.

This approach allows for a deeper exploration of how Islamic education institutions like pesantren adapt and evolve, both maintaining core religious values while integrating new knowledge and addressing contemporary social issues.

5. Conclusion

The results of the bibliometric mapping and thematic analysis suggest that the academic discourse surrounding pesantren, adolescents, and Islamic education is moving toward an increasingly complex and reflective conceptual phase. Key themes such as adolescent development, cultural change, and educational transformation indicate a paradigm shift from descriptive studies to interpretive and critical analyses that emphasize the relationship between identity, power, and social transformation.

At the same time, themes like leadership, agency, and gender signal conceptual potential to challenge traditional epistemic structures in Islamic education, opening space for feminist, intersectional, and postcolonial perspectives. This evolving discourse highlights the growing complexity of understanding the dynamics of Islamic education in

a rapidly changing global and social context, paving the way for future research that bridges traditional values with contemporary issues and challenges.

Therefore, future research should be directed toward building a theoretical synthesis that connects the micro dimension (the individual experiences of adolescents in pesantren) with the macro dimension (social, cultural, and technological changes in Muslim societies). The integration of major theories such as Symbolic Interactionism, Social Identity Theory, Feminist Standpoint Theory, and Ecological Systems Theory will enrich our understanding of Islamic education dynamics as a living, adaptive social system.

The complexity of the issues that emerge—from identity formation, female leadership, to the social construction of the body and technology—demands an interdisciplinary and methodologically reflective research approach. Future researchers are expected not only to describe phenomena in Islamic education but also to interpret and contextualize them within the framework of ongoing global changes.

Finally, this research affirms that pesantren is not just a religious-based educational institution but a dynamic social space where the negotiation of meaning, power, and identity takes place continuously. By understanding pesantren as a complex arena for social and spiritual transformation, researchers have significant opportunities to develop new theories that are not only relevant to the Islamic context but also enrich the global body of social and educational knowledge.

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