

Transformative Leadership in Indonesian Islamic Boarding Schools: SDGs-Based Global Insights

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Abstract

Objective: This study aims to map publication trends on transformative leadership in Indonesian Islamic boarding schools (2015–2025) and examine its relevance to curriculum integration, leadership practices, and sustainable education development.

Theoretical framework: The study is grounded in Transformative Leadership Theory and aligned with the Sustainable Development Goals (SDGs) framework initiated by the United Nations, particularly SDG 4, SDG 9, SDG 16, and SDG 17, positioning leadership as a driver of sustainable education.

Literature review: The literature highlights the role of transformative leadership in improving motivation, organizational culture, and curriculum innovation in Islamic boarding schools, while revealing limited integration with global sustainability and SDGs-oriented perspectives.

Methods: A bibliometric analysis of 373 Scopus-indexed articles (2015–2025) was conducted using Biblioshiny to analyze publication trends, thematic structures, and collaboration networks, with SDGs used as an interpretative lens.

Results: The findings show a sharp increase in publications since 2018, with Indonesia as the main research hub and dominant themes related to leadership, character education, and human capital development within boarding schools.

Implications: The results support SDG 4 by strengthening leadership capacity and inclusive education, SDG 9 through innovation and technology integration, and SDG 16–17 by promoting ethical institutions and research collaboration.

Novelty: This study offers a novel SDGs-oriented bibliometric synthesis that integrates global research trends with the local context of Islamic boarding schools, positioning transformative leadership as a bridge between faith-based education and sustainable development.

Keywords: transformational leadership, boarding school, islamic education, islamic boarding school, sdgs, quality education.

INTRODUCTION

Transformative leadership, defined by the dimensions of idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration, has become a dominant paradigm in contemporary educational leadership. This model emphasizes leaders' capacity to inspire shared vision, foster innovation, empower

stakeholders, and build ethical and inclusive institutional cultures. Globally, research on transformative and transformational leadership in education has grown substantially [1], [2]. A systematic review of 7,328 publications demonstrates consistent empirical evidence that this leadership model positively influences school culture, teacher performance, organizational effectiveness, and learning innovation. These findings highlight the strategic role of transformative leadership in enabling educational institutions to adapt to rapid social, technological, and economic change [3], [4].

From a global development perspective, transformative leadership in education is closely aligned with the Sustainable Development Goals (SDGs) framework initiated by the United Nations. Education is positioned as a central driver of sustainable development, particularly under SDG 4 (Quality Education), which emphasizes inclusive, equitable, and lifelong learning, as well as the development of relevant skills for the twenty-first century [5], [6]. Leadership quality is a critical enabler in achieving these targets, as it shapes how educational policies, curricula, and institutional cultures are translated into sustainable learning practices. In this context, transformative leadership provides an operational framework for implementing SDG principles through innovation, inclusivity, ethical governance, and human-centered development [7], [8].

The dimensions of transformative leadership demonstrate clear relevance to specific SDG targets. Intellectual stimulation supports SDG 4.4 by promoting critical thinking, creativity, and innovation-oriented competencies. Individualized consideration aligns with SDG 4.5 by addressing learner diversity and reducing educational inequalities [9]. Meanwhile, idealized influence and inspirational motivation contribute to SDG 16 by strengthening ethical leadership, institutional integrity, and participatory governance. Through these mechanisms, transformative leadership extends beyond organizational performance and functions as a strategic instrument for sustainable human development [10].

In Indonesia, empirical studies confirm the positive impact of transformative leadership on educational institutions. Large-scale surveys show that this leadership model enhances learning culture, organizational structure, innovation capacity, and teacher motivation [11]. These findings are consistent with national education development priorities, including the National Research Master Plan and Asta Cita point 4, which emphasize strengthening human resources, education quality, science, technology, and innovation as foundations for sustainable national development [12].

Within this national context, Islamic boarding schools (pesantren) represent a distinctive educational ecosystem. Pesantren integrates formal instruction with moral education, character formation, independence, and community-based learning. Leadership in pesantren, therefore, carries a dual responsibility: ensuring academic quality while cultivating ethical values, social responsibility, and life skills [13]. From an SDGs perspective, pesantren contribute not only to SDG 4 (Quality Education), but also to SDG 10 (Reduced Inequalities) through inclusive access to education and SDG 16 (Peace, Justice, and Strong Institutions) through moral and ethical leadership formation.

Previous studies indicate that visionary and inclusive leadership in pesantren can enhance curriculum integration, promote collaboration among educators, and bridge religious education with modern science and technology. Leadership interventions in boarding school settings have also been shown to influence student behavior, discipline, and social responsibility [14]. However, despite these findings, research on transformative leadership in Indonesia has largely focused on public schools, madrasas, or higher education institutions, with limited attention to Islamic boarding schools as residential and faith-based learning environments.

Moreover, existing studies tend to examine isolated outcomes such as teacher motivation or performance without explicitly linking leadership practices to sustainability agendas, innovation culture, and twenty-first-century competencies. There is also a lack of research

integrating national empirical evidence with global publication trends to position Indonesia within the international scholarly landscape on transformative leadership and sustainable education. This gap is critical given the strategic role of pesantren in shaping students' character, leadership capacity, and social values from an early age [15].

Accordingly, this study addresses the following research question: What are the global research trends on transformative leadership in education, and how does this leadership model contribute to the achievement of the Sustainable Development Goals (SDGs) within the management of Islamic boarding schools in Indonesia? By integrating global bibliometric analysis with national contextual insights, this study positions transformative leadership as a strategic bridge between educational leadership theory and the SDGs framework. The findings are expected to inform policymakers, pesantren leaders, and leadership development institutions in designing evidence-based strategies to strengthen institutional innovation, human resource quality, and sustainable educational outcomes aligned with national and global development goals.

This study aims to provide a comprehensive and systematic analysis of research on transformative leadership in the context of Islamic boarding school education in Indonesia, while situating national research developments within global scholarly trends and the Sustainable Development Goals (SDGs) framework. Specifically, the objectives of this research are to:

1. Analyze publication trends and collaboration patterns in research on transformative leadership and Islamic boarding school education in Indonesia.
2. Identify influential authors, journals, and articles based on publication output and citation impact.
3. Map dominant and emerging research themes on transformative leadership in Indonesian boarding schools.
4. Identify research gaps and future directions aligned with twenty-first-century education challenges and the Sustainable Development Goals (SDGs).

LITERATURE REVIEW

Transformative Leadership and the SDGs in Education

Transformative leadership has been widely examined as a strategic approach to improving educational quality, organizational effectiveness, and human resource development. Within the global education discourse, this leadership model is increasingly positioned as an institutional mechanism for advancing the Sustainable Development Goals (SDGs) initiated by the United Nations. In particular, SDG 4 (Quality Education) emphasizes not only access to education but also leadership capacity to ensure inclusive, equitable, and innovative learning environments. Studies in educational leadership consistently indicate that leaders who apply transformative principles are more effective in translating policy goals into sustainable institutional practices through ethical governance, innovation, and stakeholder empowerment [16].

The dimensions of transformative leadership, idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration are conceptually aligned with several SDG targets. Intellectual stimulation supports SDG 4.4 by fostering critical thinking, creativity, and future-oriented skills. Individualized consideration contributes to SDG 4.5 by addressing learner diversity and reducing educational inequalities. Meanwhile, idealized influence and inspirational motivation resonate with SDG 16, which emphasizes ethical leadership, institutional integrity, and participatory governance. This alignment positions transformative leadership as a bridge between educational leadership theory and the global sustainability agenda [17].

Transformative Leadership in Islamic Boarding Schools (Pesantren)

In the Indonesian context, Islamic boarding schools (pesantren) represent a distinctive educational ecosystem that integrates academic instruction, moral education, character formation, and community living. Empirical studies on leadership in pesantren indicate that transformational and transformative leadership styles play a significant role in strengthening organizational commitment and educational quality. Budiharso and Bakri found that transformative leadership positively influences job satisfaction among pesantren staff, which in turn enhances organizational commitment and institutional stability. These findings align with SDG 4.c, which emphasizes the importance of qualified, motivated, and supported educators in achieving quality education [18].

Further evidence highlights the role of intellectual stimulation in improving student motivation and academic performance. Tantowi et al. demonstrated that leadership practices encouraging critical inquiry and creativity significantly enhance students' learning outcomes in Islamic boarding schools [19]. From an SDGs perspective, these outcomes contribute to SDG 4.4 by strengthening students' competencies for lifelong learning and future employment. Similarly, Rahman's study in Aceh shows that leadership sensitive to local cultural values enables more adaptive and innovative curriculum development [20]. This culturally responsive leadership approach supports SDG 4.7, which promotes education that respects cultural diversity and fosters global citizenship.

Community-Based and Digital Leadership as Enablers of SDGs

Beyond internal leadership dimensions, community engagement and technological integration have emerged as complementary factors in the effectiveness of leadership in pesantren. Ibrahim emphasizes that community-based education management strengthens collaboration among teachers, students, and local stakeholders, creating participatory and human-centered learning environments [21]. Such leadership practices reflect the principles of SDG 16, which calls for inclusive and accountable institutions, and SDG 17, which underscores the importance of partnerships in achieving sustainable development goals.

In parallel, the growing emphasis on digital leadership reflects the need for pesantren to adapt to technological change without compromising religious and cultural values. Saepurohman et al. highlight that leadership grounded in digital literacy enables Islamic boarding schools to integrate technology into learning processes while preserving institutional identity [22]. Digital leadership in pesantren supports SDG 4.4 by developing digital and future-oriented competencies, and SDG 9 by encouraging innovation in educational infrastructure. These studies indicate that openness to technological innovation, when guided by transformative leadership, strengthens the capacity of pesantren to respond to twenty-first-century educational challenges.

METHODOLOGY

This study employs a bibliometric analysis to examine global research trends on transformative leadership in Islamic boarding school education (pesantren) in Indonesia and to assess their implications for the Sustainable Development Goals (SDGs). Bibliometric analysis was selected because it enables a systematic and quantitative mapping of scientific publications, citation patterns, collaboration networks, and research themes. The SDGs framework initiated by the United Nations is used as an analytical reference to interpret how transformative leadership research contributes to sustainable and inclusive education.

The data were collected from the Scopus database, chosen for its wide international coverage and rigorous peer-review standards. The search query applied was:

(*TITLE-ABS-KEY* (“*Transformative Leadership*”) *OR* *TITLE-ABS-KEY* (“*Boarding School*”)) *AND* *TITLE-ABS-KEY* (“*Indonesia*”).

The initial search returned 507 documents. After applying the inclusion criteria, publication years 2015–2025, journal articles, English language, and peer-reviewed sources, a total of 373 documents were retained for analysis. The ten years were selected to capture recent and relevant developments in the field.

Bibliometric data were exported in BibTeX format and analyzed using Biblioshiny, the graphical interface of the bibliometrix package in R. Data cleaning was conducted to remove duplicates and ensure consistency of authors, keywords, and affiliations. The analysis included annual publication trends, citation analysis, author and institutional collaboration networks, keyword co-occurrence, and thematic mapping.

The analytical procedure consisted of four main steps: (1) descriptive analysis of publication and citation trends, (2) network analysis of authors, institutions, and keywords, (3) thematic mapping to identify dominant and emerging research themes, and (4) SDGs-oriented interpretation, in which identified themes were aligned with relevant SDG targets, particularly SDG 4 (Quality Education), SDG 16 (Peace, Justice, and Strong Institutions), and SDG 17 (Partnerships for the Goals).

Through this approach, the study provides a concise overview of the intellectual structure and development of transformative leadership research in Indonesian Islamic boarding schools, while highlighting its relevance to global sustainable education agendas.

RESULTS AND DISCUSSION

Publication Trends, Fields of Study, and State Collaborations

This section presents the bibliometric results of 373 journal articles published between 2015 and 2025 on transformative leadership and Islamic boarding school education in Indonesia. The analysis covers annual publication trends, disciplinary fields, and patterns of international collaboration, providing insight into the evolution of this research area within the broader context of sustainable education aligned with the Sustainable Development Goals (SDGs) initiated by the United Nations.

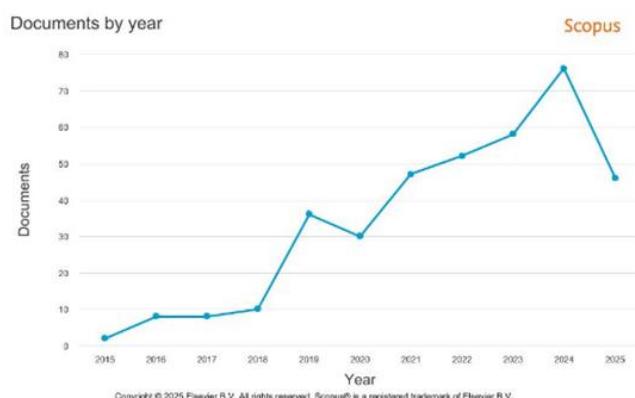


Figure 1. Number of Documents per Year

As shown in Figure 1, the number of publications increased gradually from 2015 to 2018, followed by a sharp rise in 2019. After a temporary decline in 2020, publication output recovered steadily and reached its peak in 2024, with nearly 80 documents, before declining in 2025. Despite this decrease, the volume of publications in the later years remains substantially higher than in the early period of analysis.

This upward trend reflects a growing scholarly engagement with leadership models that support inclusive, innovative, and sustainable education, particularly in faith-based and

boarding school contexts. The expansion of research activity corresponds with increased global attention to SDG 4 (Quality Education), which emphasizes leadership capacity, institutional effectiveness, and the development of relevant competencies for sustainable development. Furthermore, the involvement of multiple disciplines and cross-country collaborations indicates the relevance of transformative leadership research to SDG 16 (Strong Institutions) and SDG 17 (Partnerships for the Goals). Overall, the publication trends suggest that research on transformative leadership in Islamic boarding schools has increasingly been positioned within the global discourse on sustainable and inclusive educational development [23].

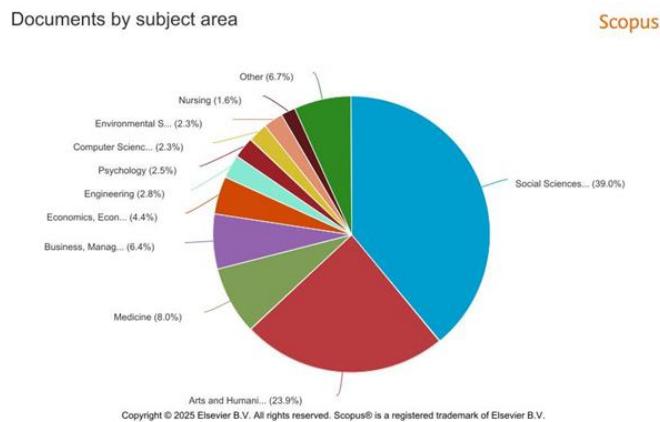


Figure 2. Field of Study

Based on Scopus data (Figure 2), publications are dominated by the Social Sciences (39%), followed by Arts and Humanities (23.9%) and Medicine (8%). Smaller contributions come from Management and Economics (10.8%), Engineering (2.8%), Psychology (2.5%), Computer Science (2.3%), Environmental Science (2.3%), Nursing (1.6%), and other fields (6.7%). From a Sustainable Development Goals (SDGs) perspective introduced by the United Nations, this distribution strongly reflects SDG 4 (Quality Education), with an emphasis on leadership, pedagogy, and values-based education. The involvement of health-related and applied science disciplines indicates growing attention to student well-being, innovation, and sustainability, aligning with SDG 9 (Industry, Innovation, and Infrastructure) and SDG 16 (Strong Institutions). Overall, the interdisciplinary profile underscores the role of transformative leadership in supporting holistic and sustainable education in an Islamic boarding school [24].

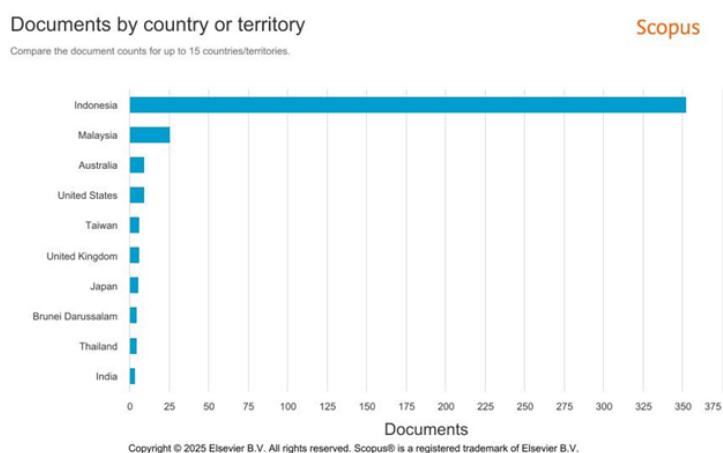


Figure 3. State Contribution

Based on Scopus data (Figure 3), Indonesia accounts for the largest share of publications, with more than 350 documents, significantly surpassing other countries. Malaysia ranks

second, followed by Australia, the United States, Taiwan, and the United Kingdom, while Japan, Brunei Darussalam, Thailand, and India contribute smaller publication outputs.

From a Sustainable Development Goals (SDGs) perspective initiated by the United Nations, this distribution highlights Indonesia's central role in advancing research on transformative leadership in Islamic boarding school education, particularly in relation to SDG 4 (Quality Education). The participation of multiple countries indicates emerging international engagement that supports SDG 17 (Partnerships for the Goals) by fostering cross-national knowledge exchange. However, the unequal distribution of publications suggests that further international collaboration is needed to strengthen the global contribution of this research area to sustainable and inclusive education [25].

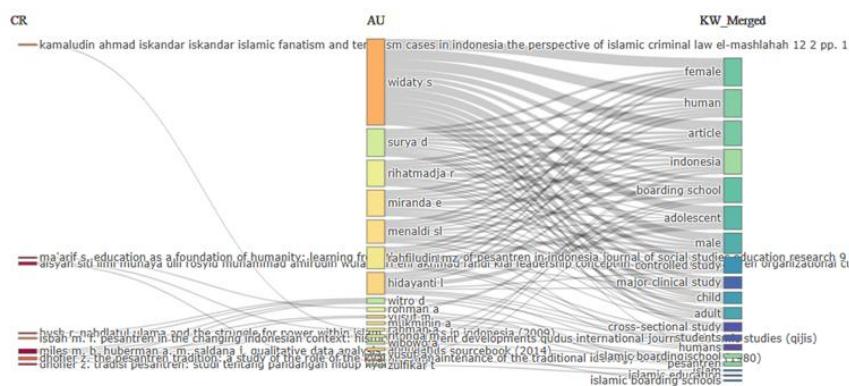


Figure 4. Collaboration

Figure 4 presents a Sankey diagram illustrating the relationships between frequently cited references, influential authors, and dominant keywords in the field. The visualization demonstrates how key references are connected to major authors such as Widaty S, Surya D, Rihatmadja R, Miranda E, and Menaldi SL, and subsequently linked to recurrent research themes, including women, youth, Islamic boarding schools, and Indonesia. These themes predominantly reflect social, educational, and religious dimensions of pesantren studies. From a Sustainable Development Goals (SDGs) perspective initiated by the United Nations, this thematic structure aligns closely with SDG 4 (Quality Education) through its focus on values-based and inclusive education, as well as SDG 5 (Gender Equality) and SDG 10 (Reduced Inequalities) through attention to gender, age groups, and social inclusion. The consistency of author-topic linkages indicates a stable scholarly network addressing sustainability-related issues in faith-based education, highlighting the role of transformative leadership research in supporting socially inclusive and ethically grounded educational development [26].

Most Influential Authors, Journals, and Articles

Before we look at the results of the analysis of the most influential authors, journals, and articles, it is important to know that this analysis provides a valuable insight into how research in this field is developing and who plays a major role in it. Data from various articles collected over a given time span show interesting trends and cooperation between authors, journals, and institutions. Here are the full results.

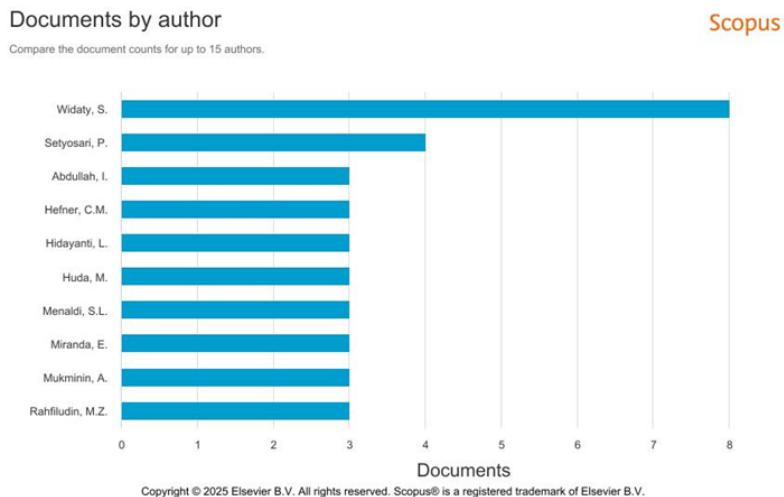


Figure 5. Most relevant authors

Figure 5 shows a list of the most active authors by number of publications. Widay, S. ranks at the top with 8 documents, a much larger number than other authors. In second place is Setyosari, P., with 4 documents, followed by Abdullah, I. with 3 documents. Meanwhile, seven other authors, Hefner, C.M., Hidayanti, L., Huda, M., Menaldi, S.L., Miranda, E., Mukminin, A., and Rahfiludin, M.Z., each contributed 2 documents. This shows that Widay, S.'s contribution to the publication is very prominent compared to other authors in this data.

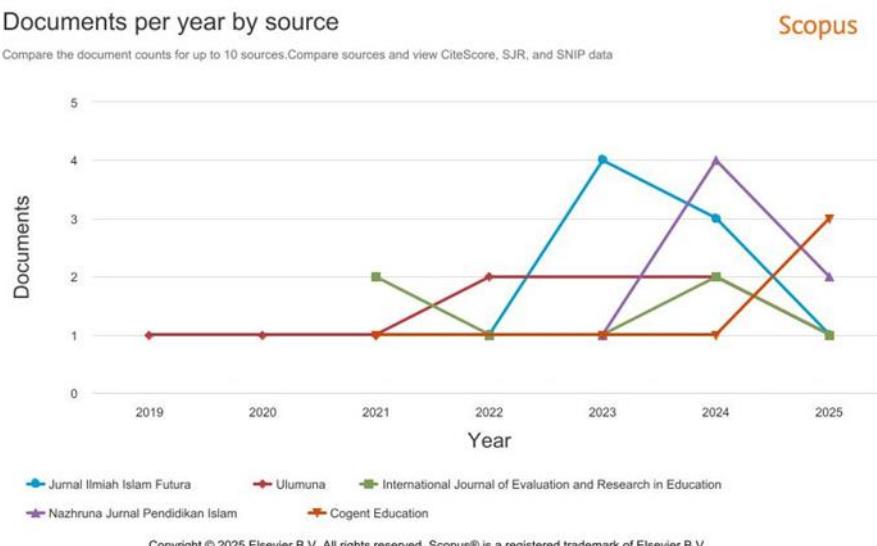


Figure 6. Most relevant sources

Figure 6 shows the journals that publish the most documents on this topic. The *Islamic Scientific Journal Futura* (blue line) saw a sharp increase in 2023 with 4 publications, but decreased to 3 in 2024 and only 1 in 2025. The *Ulumuna journal* (red line) is quite stable and is up slightly in 2025 with 2 documents. Meanwhile, the *International Journal of Evaluation and Research in Education* (green line) shows an up-and-down pattern, with its peak in 2021 (2 documents), then declining. The *Nazhruna* journal (purple line) had jumped in 2024 with 4 documents, but dropped to 1 in 2025. *Cogent Education* (orange line) has been active since 2022 and reached its peak in 2025 with 2 documents. This data indicates that publication trends vary between journals, with some experiencing spikes in any given year while others tend to be stable or fluctuating.

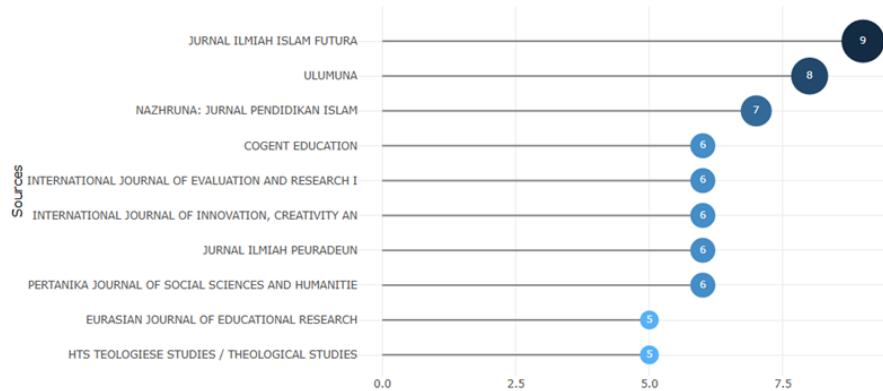


Figure 7. Most Globally Cited Documents

Figure 7 shows the list of journals with the highest number of global citations. The Islamic Scientific Journal *Futura* occupies the first position with 9 publications, followed by *Ulumuna* (8 publications) and *Nazhruna* (7 publications). Some other journals, such as *Cogent Education*, *International Journal of Evaluation and Research in Education*, and others have 5 - 6 publications. This shows that the Islamic Scientific Journals *Futura*, *Ulumuna*, and *Nazhruna* are the main sources of publications on this research topic.

Mapping and Linkage of Research Topics

The mapping of this research topic provides a clear picture of the relationship between various themes that develop in the study of leadership in Indonesian boarding schools. The following are the results of an analysis related to the relevance and development of these topics that show how the concept of transformative leadership integrates with various disciplines and local values.

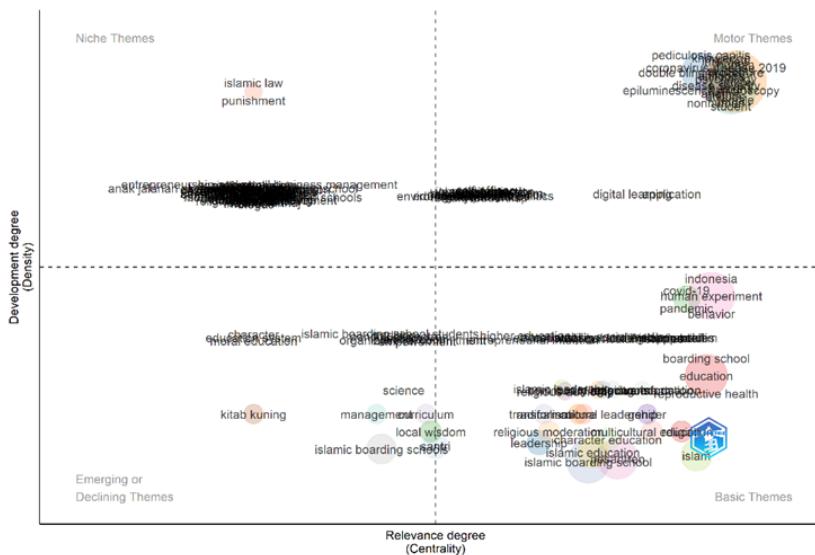


Figure 8. Key Topic Mapping

Figure 8 shows a map of research themes in the field of Islamic education based on their level of development and relevance. From this map, it can be seen that many current studies focus on innovation in the pesantren education system, curriculum development, and education management. Themes such as *Islamic Boarding Schools*, *Education*, and *Indonesia* are the main topics, indicating that research on the role of Islamic boarding schools in Indonesia is growing rapidly. This research generally discusses how pesantren shapes the character of students and remains relevant to the modern world without abandoning Islamic values.

In addition, themes such as *Islamic Education* and *Islam* remain important, although their growth is not as rapid as the other major themes. This shows that there is an effort to maintain Islamic values in education in general [27].

There is also research that tries to combine local wisdom and science in the pesantren curriculum, as seen in the theme of *Local Wisdom, Science, and Curriculum*. This points to a new direction of research that seeks to bridge Islamic traditions with the changing needs of a global society. The curriculum began to be directed not only to religious science, but also to science and technology.

Special themes such as *Islamic Law, Punishment, and Entrepreneurship in Islamic Schools* show an interest in the application of Islamic law and the development of entrepreneurship in the pesantren environment. Although not very developed, these topics have great potential for further research [28].

Overall, the direction of Islamic education research is now towards a more open and innovative model, combining religious values with modern approaches. In the future, the research is expected to focus on improving the quality of pesantren management as well as the integration between religious science and general science so that students are ready to face global challenges.

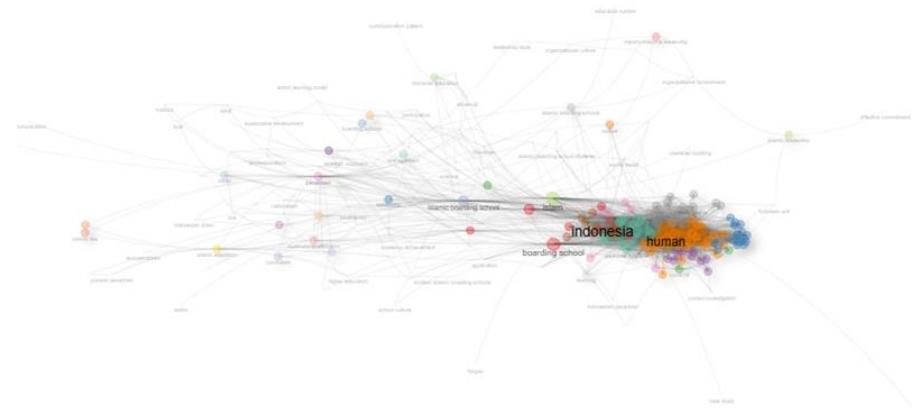


Figure 9. Linkages Between Topics

Based on Figure 9, it is clear that research topics that often appear in Islamic education, especially those related to Islamic boarding schools and schools, are interconnected in a network. Topics such as *Islamic Boarding School* and *Indonesia* emerged as the main themes, which shows that a lot of research is interested in the Islamic boarding school education system in Indonesia and its influence in the global context.

Keywords such as *boarding school*, *human*, and *Islamic boarding school* are interrelated, indicating that the focus of research is not only about the structure of formal education, but also touches on humanitarian aspects, character building, and the social role of Islamic boarding schools. This shows that pesantren education is studied as a means of personal and social formation of students [29].

In addition, there is a link to themes such as school culture, curriculum development, and leadership. This shows that the study of pesantren also highlights how the culture and leadership within it influence the learning process and character building. These themes also come into contact with the concept of global education, indicating that Islamic boarding schools in Indonesia are trying to combine Islamic values with modern educational approaches [30].

Overall, the picture shows that pesantren education in Indonesia is closely related to social, humanitarian, and character development values. Future research can further explore

how pesantren combine religious values with globally relevant curricula, as well as its impact on students and the surrounding community.

Potential Future Research Topics

Research on Islamic education, especially in Islamic boarding schools, still has many interesting opportunities to be developed. One important focus is how to manage a curriculum that combines religious science and modern knowledge. Currently, many Islamic boarding schools are beginning to unite local values and scientific approaches so that students not only understand religion, but also have the ability to think critically and master science. Further research can assess how effective this combination is in improving learning outcomes and preparing students for the modern world [\[31\]](#).

Another topic that is no less important is leadership in the Islamic education environment. Leaders who can transform have a big role in creating a motivating learning atmosphere for teachers and students. Future research can look at the relationship between this kind of leadership style and the success of education in Islamic boarding schools, as well as look for ways to strengthen the quality of leadership so that it can compete globally without losing Islamic values.

In addition, the influence of globalization on Islamic education in Indonesia also needs to be studied more deeply. International collaborations and educational experiments in Islamic boarding schools open up opportunities to understand how global trends affect the local Islamic education system. This research can explore the similarities and differences between educational models in Indonesia and other countries, as well as how pesantren can adapt to the needs of the modern world without abandoning religious teachings [\[32\]](#).

No less important is the role of pesantren in shaping the character and social responsibility of students. Research in this field can reveal the extent to which religious education in pesantren helps build the morals and social concern of students, as well as its impact on society at large. In the midst of rapid social change, it is important to know the contribution of pesantren in forming a good person and ready to play a role in society.

In conclusion, the future of Islamic education in Islamic boarding schools holds a lot of potential to be studied further, in order to create an education that is relevant to the times but still based on Islamic values.

Publication Trends

The significant increase in publications since 2018, reaching a peak in 2024, indicates a strengthening academic focus on transformative leadership in Indonesian Islamic boarding schools. This trend reflects the growing relevance of leadership models that emphasize shared vision, innovation, and human-centered development, consistent with Transformative Leadership Theory. Empirical evidence from Indonesia, including quantitative findings showing improvements in teacher motivation and school effectiveness, further confirms the applicability of this leadership approach in local educational contexts [\[33\]](#).

From a Sustainable Development Goals (SDGs) perspective initiated by the United Nations, this publication's growth aligns closely with SDG 4 (Quality Education), particularly in strengthening leadership capacity, institutional effectiveness, and twenty-first-century competencies. The dominance of Social Sciences and Arts and Humanities highlights the centrality of values, culture, and social interaction in boarding school education, while contributions from engineering, computer science, and health-related disciplines indicate a gradual shift toward interdisciplinary integration. This pattern reflects leadership-driven innovation supporting digital transformation and student well-being, relevant to SDG 9 (Innovation and Infrastructure) [\[34\]](#).

Geographically, Indonesia's dominant contribution positions the country as a regional reference for research on residential and faith-based educational leadership. The contextualization of transformative leadership through Islamic values, character education, and national identity illustrates how local educational models can contribute to global leadership discourse, supporting SDG 16 (Strong Institutions). Furthermore, the concentration of research themes on character building, student behavior, and human resource development underscores the role of transformative leadership in advancing inclusive, adaptive, and sustainable education systems. Collectively, these trends demonstrate how global research dynamics and local educational contexts converge to support leadership practices aligned with the SDGs.

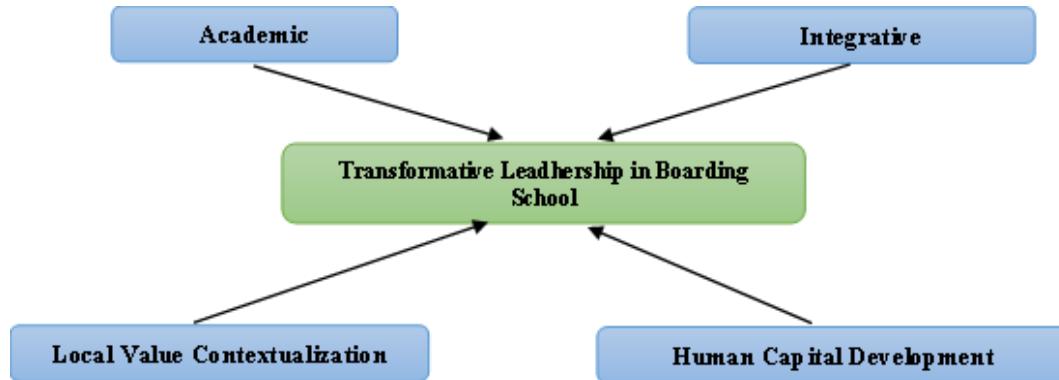


Figure 10. Model Transformative Leadership in Indonesian Boarding Schools

The synthesis of the findings produces a Transformative Leadership Model for Indonesian Islamic Boarding Schools (Figure 10), positioning leadership as the core driver of sustainable pesantren education. The model integrates four interconnected pillars: academic momentum, interdisciplinary integration, local value contextualization, and human capital development, which collectively foster an adaptive, innovative, and values-based educational ecosystem. Viewed through the Sustainable Development Goals (SDGs) framework initiated by the United Nations, the model aligns with SDG 4 (Quality Education), SDG 9 (Innovation), and SDG 16 (Strong Institutions), demonstrating how Indonesian boarding schools are evolving toward globally relevant yet culturally grounded education systems [35].

Integration of Influential Authors, Sources, and Documents in the Academic Social Learning Ecosystem

The combined analysis of the most relevant authors, key publication sources, and globally cited documents reveals a concentrated academic social learning ecosystem in research on transformative leadership and Islamic boarding school education. Several authors, notably Widay S. and Setyosari P., occupy central positions within the publication network, functioning as knowledge hubs that connect themes such as leadership, pesantren education, and human capital development. Their prominence reflects not only high research productivity but also strong cross-institutional and thematic collaboration, consistent with social network theory that emphasizes the role of central actors in shaping knowledge diffusion [36].

At the source level, journals such as *Futura*, *Ulumuna*, and *Nazhruna* serve as primary knowledge channels that consolidate discourse on transformative leadership in Islamic education. These journals function as stable platforms for thematic integration, particularly on local value contextualization, character education, and educational innovation, thereby facilitating cumulative knowledge development. Influential and frequently cited documents act as intellectual anchors by integrating leadership theory, empirical evidence, and policy-relevant insights, ensuring continuity and coherence within the research field [37].

From a Sustainable Development Goals (SDGs) perspective initiated by the United Nations, this interconnected ecosystem supports SDG 4 (Quality Education) through sustained leadership knowledge production and SDG 17 (Partnerships for the Goals) through collaborative research networks. Overall, the interaction between influential authors, consistent publication outlets, and core documents forms an adaptive academic learning system that strengthens the global visibility and sustainability orientation of transformative leadership research in Indonesian Islamic boarding schools.

Main Topics And The Relationship Between Topics

The thematic map analysis identifies four central research clusters: Indonesia, human, boarding school, and Islamic boarding school, which function as core nodes within the research ecosystem. The strong interconnections among these themes indicate a dominant focus on human-centered, residential education within the socio-cultural context of Indonesia. From these core clusters, thematic extensions emerge toward issues such as Islam, local wisdom, character education, curriculum development, and science, reflecting the integration of cultural values with academic and scientific approaches. This pattern is consistent with Transformative Leadership Theory, which emphasizes the alignment of vision, values, and learning to drive systemic change in educational institutions [\[38\]](#).

From a Sustainable Development Goals (SDGs) perspective initiated by the United Nations, these thematic relationships align strongly with SDG 4 (Quality Education) through their emphasis on inclusive, values-based, and context-responsive learning. The shift from normative discussions toward applied and multidisciplinary themes such as digital learning, human capital development, and curriculum innovation also supports SDG 9 (Innovation) and SDG 16 (Strong Institutions). Overall, the dense central network combined with expanding thematic branches indicates a maturing research field with strong potential for cross-disciplinary and international collaboration, contributing to the development of adaptive and globally relevant boarding school education models [\[39\]](#).

Potential Topics For Future Research

The findings of this study indicate several promising directions for future research on transformative leadership in Indonesian Islamic boarding schools. First, the development of technology-enabled transformative leadership models represents a major research opportunity. The growing emphasis on digital learning and human capital development suggests the need to examine how emerging technologies such as digital learning platforms, artificial intelligence, and learning analytics can strengthen the core dimensions of transformative leadership. Future studies may adopt hybrid frameworks that integrate leadership theory with socio-technical systems, positioning technology as an integral component of educational transformation rather than a supporting tool. From a Sustainable Development Goals (SDGs) perspective initiated by the United Nations, this line of inquiry aligns with SDG 4 (Quality Education) and SDG 9 (Innovation and Infrastructure) [\[40\]](#).

Second, further research is needed on the integration of local values and cultural wisdom with science- and technology-based curricula in pesantren education. This approach offers potential to develop hybrid curricula that remain socially and culturally relevant while meeting global educational standards, particularly in STEM fields integrated with Islamic character education. Design-based research methodologies could be employed to test and refine such models across diverse boarding school contexts, contributing to context-responsive leadership and sustainable curriculum innovation [\[41\]](#).

Finally, the analysis highlights opportunities to expand international and regional research collaboration. The current concentration of publications within Indonesia suggests the need for comparative and cross-national studies involving ASEAN and other global contexts. Such research could examine how variations in leadership practices, policy environments, and cultural values influence educational innovation in boarding schools.

Strengthening international research networks would support SDG 17 (Partnerships for the Goals) and enhance the global relevance and transferability of Islamic boarding school education models.

CONCLUSION

This study demonstrates that research on transformative leadership in Indonesian Islamic boarding school education has grown substantially, particularly since 2018, reflecting increasing academic recognition of leadership as a key driver of educational quality and institutional effectiveness. The bibliometric findings indicate that transformative leadership plays a strategic role in strengthening teacher motivation, organizational culture, innovation capacity, and context-responsive learning within boarding school environments. These trends confirm the relevance of transformative leadership theory in pesantren education, where academic development is closely integrated with moral values, character formation, and community-based learning. Viewed through the Sustainable Development Goals (SDGs) framework initiated by the United Nations, the findings highlight the contribution of transformative leadership to SDG 4 (Quality Education) by enhancing leadership capacity, inclusive learning, and twenty-first-century competencies. The growing interdisciplinary orientation of the research also supports SDG 9 (Innovation and Infrastructure) through the integration of technology and innovation, while the emphasis on ethical, values-based leadership aligns with SDG 16 (Strong Institutions). Moreover, emerging international collaboration patterns underscore the relevance of SDG 17 (Partnerships for the Goals) in advancing sustainable educational research. Overall, this study positions Indonesian Islamic boarding schools as a significant case for understanding how faith-based and residential education systems can contribute to global sustainable education agendas. Future research integrating national and international data, as well as examining the alignment of transformative leadership with integrated curricula combining religious values, science, and technology, is essential to further develop adaptive, sustainable, and globally competitive educational leadership models.

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Author Contribution

All authors contributed equally to the main contributor to this paper, some are the chairman, member, financier, article translator, and final editor. All authors read and approved the final paper.

Conflicts of Interest

All authors declare no conflict of interest.

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