

Evolution and future directions in school leadership development research: A global bibliometric perspective (2015-2025)

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ABSTRACT

School leadership is recognized globally as a strategic factor in enhancing educational quality. This study aims to map publication trends, citation patterns, scholarly collaboration, thematic developments, and future research directions in school leadership training from 2015 to 2025. Employing a bibliometric approach on 1,119 documents from the Scopus database, the data were analyzed using OpenRefine, Biblioshiny, and VOSviewer. The findings reveal a marked increase in publications, peaking in 2024. The most prolific authors are Aas, M. and Schildkamp, K. while the most influential contributors include Daniëls, E. and Van Miegheem, A. Professional Development in Education and Educational Management Administration and Leadership are leading journals in this domain. The top affiliated institutions are the University of Twente, the University of California, and the University of Oslo. The United States has the highest number of corresponding authors, followed by Australia and the United Kingdom. Thematic analysis identified six principal clusters: instructional leadership, professional development, digital leadership, and social justice. Emerging research trends highlight a growing focus on sustainability, well-being, and digital transformation. These findings provide a comprehensive overview of the current scholarly landscape in school leadership training. This mapping is a foundation for shaping future research agendas, prioritizing responsive, human-centered, and contextually relevant leadership models, essential for policymakers and practitioners in formulating effective leadership development strategies amid global educational challenges.

Keywords: school leadership, principal, school management, professionalism, instructional

INTRODUCTION

School leadership refers to influencing and directing various elements within the educational environment to achieve institutional goals effectively and sustainably. School leaders play a crucial role in administrative functions and in articulating a shared vision, fostering a collaborative culture, promoting innovation, and enhancing the quality of teaching and learning (Huguët, 2017; Mincu, 2022). Effective leadership has been widely acknowledged as a key determinant of school improvement, teacher effectiveness, and student achievement (Gebczynski & Kutsyuruba, 2022). As educational systems globally face increasing complexity, due to policy reforms, accountability demands, and equity challenges, the need for robust and adaptive leadership development strategies becomes increasingly urgent (Arar & Örüçü, 2021; Munby, 2020).

One of the primary approaches to developing school leadership capacity is through structured training programs for current and prospective school leaders (Alladatin et al., 2023; Miri et al., 2024). Well-designed training initiatives

equip leaders with the necessary knowledge, skills, and dispositions to perform their roles effectively, particularly in response to the dynamic challenges of contemporary education (Adams & Muthiah, 2020; Ng, 2017). These programs enhance competencies in instructional leadership, change management, data-informed decision-making, and navigating socio-educational dynamics and policy landscapes (Aas & Paulsen, 2019; Bowers, 2017). Consequently, the quality and relevance of such training are pivotal in strengthening school leadership capacity, especially in the context of 21st century educational demands.

School leadership training has increasingly become a focal point of educational policy and practice in various countries. Gumus et al. (2018) highlighted diverse emphases in principal preparation programs, including distributed, instructional, teacher, and transformational leadership, with the latter receiving the most academic attention. Similarly, Paring (2024) reported that instructional leadership models are prevalently implemented, particularly at the secondary education level. Despite this growing interest, a comprehensive understanding of global research developments in this area remains limited. Existing literature

focuses on systematic reviews and lacks a broad analysis of how principal training research has evolved. Moreover, there is insufficient clarity regarding the contributions of different countries, institutions, and authors in shaping the field's direction. In this regard, bibliometric studies are instrumental in uncovering publication trends, scholarly collaboration networks, dominant research themes, and knowledge structures that can guide future directions more strategically and evidence-based.

A growing body of research has examined diverse aspects of school leadership training, such as the role of leadership in integrating information and communication technologies into education (Briñez et al., 2023), the development of leadership identity among principals (Rodríguez et al., 2021), and the implementation of systemic leadership for fostering inclusive school environments (White et al., 2025). Additionally, studies have addressed the importance of leadership preparation in supporting student mental health (Daly et al., 2025). However, many of these investigations are thematically narrow, focused on specific areas such as technology, identity formation, or mental health, and are often regionally or temporally confined. Most rely on systematic literature review methodologies, which, while valuable, do not comprehensively map global trends in school leadership training research.

Given these limitations, there is a pressing need for a holistic analysis that captures the breadth and evolution of this field over the past decade. This study seeks to address this gap by conducting a bibliometric analysis of global research on school leadership training from 2015 to 2025. It offers an in-depth exploration of publication patterns, thematic developments, citation dynamics, and collaborative networks. The aim is to provide a comprehensive overview that can inform future research priorities, policy formulation, and leadership development practices. To guide the analysis, this study is structured around the following research questions:

1. What are the publication trends and citation patterns in school leadership development from 2015 to 2025?
2. Who are the most influential prolific and influential authors, institutions, sources of relevant journals, and countries in the field of school leadership development?
3. What are the main thematic clusters and emerging research topics within school leadership development?
4. What potential research areas warrant further exploration in future studies on school leadership development?

METHODOLOGY

This study adopts a bibliometric approach to explore global trends and map the knowledge structure within school leadership training programs. The objective is to uncover publication patterns over the past decade (2015-2025), analyze citation dynamics, examine thematic developments, and identify research collaboration networks. This methodology enables a comprehensive and data-driven understanding of this area's evolution and current state of research. Scopus was selected as the data source due to its multidisciplinary

coverage and reputation as one of the most comprehensive and reliable scientific databases globally (Nasrum et al., 2025; Salido et al., 2024).

The investigative process in this study is structured according to a five-stage bibliometric analysis framework, comprising research design, data collection, data analysis, data visualization, and data interpretation, as illustrated in **Figure 1** (Salido et al., 2024; Zhu et al., 2023). In the research design stage, the study formulated its central objective, which focuses on identifying the intellectual structure and global research trends within the field of school leadership training programs. The scope was defined both temporally (2015-2025) and thematically through the careful selection of keywords and inclusion criteria. This stage also involved the determination of analytical parameters, including the types of documents considered, namely journal articles, review articles, and conference proceedings.

The data collection stage involved constructing a comprehensive search query to retrieve relevant publications from the Scopus database. The search string used was: ("school leader" OR "school leadership" OR "educational leader") AND ("training program" OR "professional training" OR "leadership development" OR "professional development"). This query was executed on May 3, 2025. To ensure precision and scope alignment, the results were filtered to include only peer-reviewed sources published between 2015 and 2025, yielding a total of 1,119 documents.

The data analysis stage began with the cleaning and standardization of metadata using OpenRefine. This step addressed issues such as duplicate entries, inconsistent author naming conventions, and variations in institutional affiliations. This step addressed issues such as duplicate entries, inconsistent author naming conventions, and variations in institutional affiliations (see **Supplementary file** for detailed data). Cleaned data were then processed using Biblioshiny, the graphical interface of the Bibliometrix package in R (Aria & Cuccurullo, 2017), which facilitated the generation of descriptive statistics, including annual publication trends, productive authors, source impact, and country-level contributions. In parallel, VOSviewer was employed to generate network maps, particularly focusing on co-authorship patterns and keyword co-occurrences to uncover thematic linkages and collaborative structures.

In the data visualization stage, insights obtained from the analyses were transformed into graphical representations to facilitate interpretation. Biblioshiny was used to generate trend graphs and distribution plots, while VOSviewer provided network diagrams illustrating the intellectual and thematic structure of the field. These tools enhanced the accessibility and interpretability of complex bibliometric patterns.

Finally, data interpretation stage integrated quantitative findings with narrative synthesis. Patterns identified in the bibliometric indicators were examined in the broader context of educational leadership research. Particular attention was paid to emerging themes, shifts in scholarly focus over time, and the geographic distribution of research activity. This stage aimed to provide a coherent and reflective understanding of the evolution of school leadership training research and to highlight implications for future scholarly inquiry.

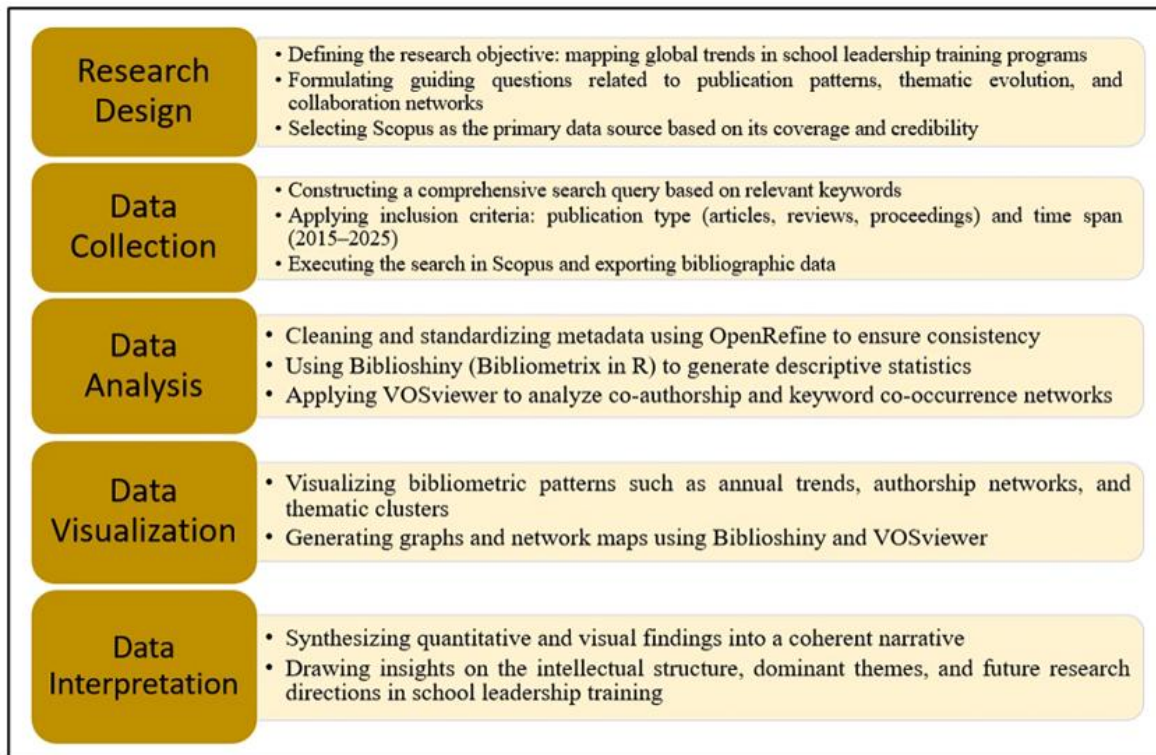


Figure 1. Investigation procedure (Adapted and elaborated from the work of Zhu et al., 2023)

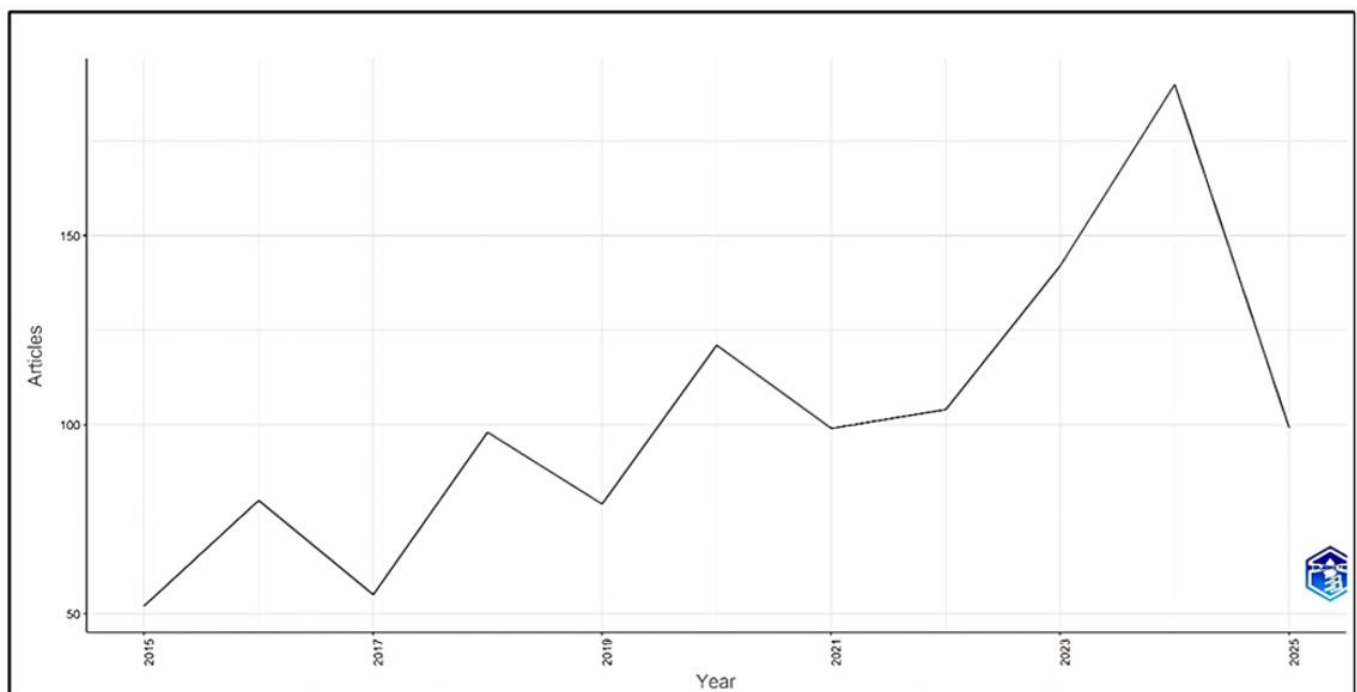


Figure 2. Landscape of school leadership development publications (Source: Authors' own elaboration, using Biblioshiny)

RESULTS

Annual Publication Trends in School Leadership Development Research (2015-2025)

The annual trend of scientific publications in school leadership development from 2015 to early 2025, as analyzed using the R-Biblioshiny tool, is illustrated in **Figure 2**.

Figure 2 demonstrates a generally consistent publication growth, with the most notable surge occurring in 2023. Beginning with 52 articles in 2015, the number of publications fluctuated moderately through 2021, before entering a steady growth phase and reaching a peak of over 180 articles in 2024. The slight decline observed in 2025 does not reflect the final total for the year, as ongoing publication processes and delayed indexing are expected to contribute additional entries.

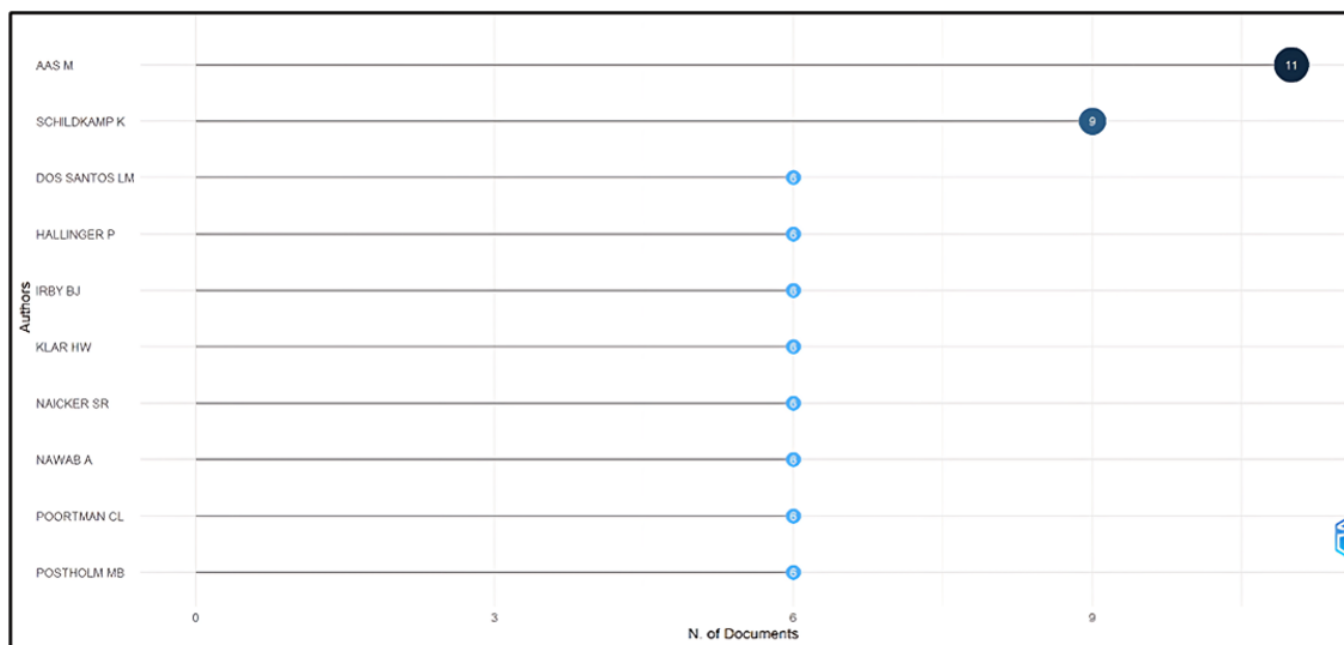


Figure 3. Top 10 prolific authors relevant (Source: Authors' own elaboration, using Biblioshiny)

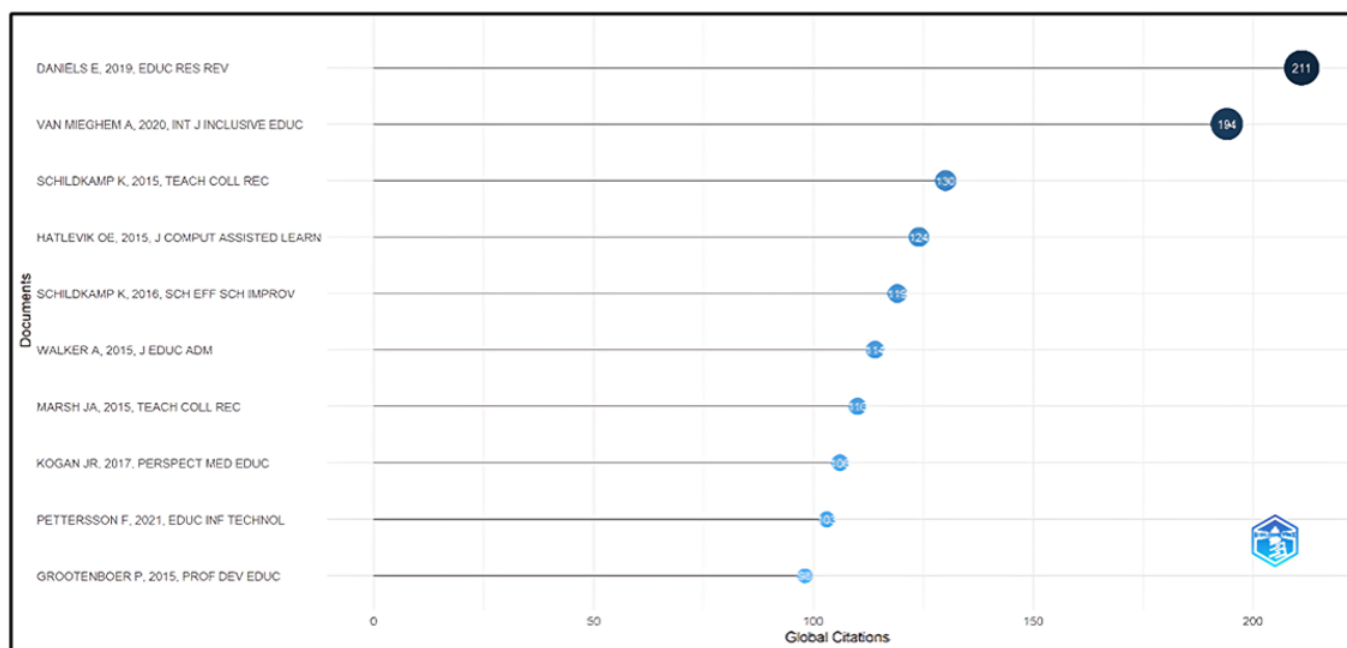


Figure 4. Top 10 most cited publications (Source: Authors' own elaboration, using Biblioshiny)

Key Contributors and Geographic Distribution

An analysis of the most prolific authors in school leadership development over the past decade is presented in Figure 3. This section covers the top 10 authors who have contributed the most work in the form of publications in this field.

Figure 3 shows that Aas, M. emerged as the most productive author with 11 publications, followed by Schildkamp, K. with 9. Other notable contributors, each with six publications, include Dos Santos, Hallinger, P., Irby, Klar, Naicker, Nawab, Poortman, C. L., and Postholm. Furthermore, the results of the analysis of the authors having an impact on this field are presented in Figure 4.

Figure 4 shows the top 10 authors affected by the citation count review. Daniëls, E.'s 2019 publication leads with 211 citations, followed by Van Miegheem (2020) with 194 citations. Other influential works include publications by Schildkamp, K. in 2015 and 2016 (130 and 119 citations, respectively), and Hatlevik (2015) with 124 citations. Other highly cited authors include Walker (114 citations), Marsh (110), Kogan (106), Pettersson (103), and Grootenboer (98). The analysis further identified the top ten journals contributing to this field, which are presented in Figure 5.

Figure 5 shows that the Professional Development in Education journal source leads with 57 documents, followed by Educational Management Administration & Leadership with 53. Other prominent journals include the International Journal

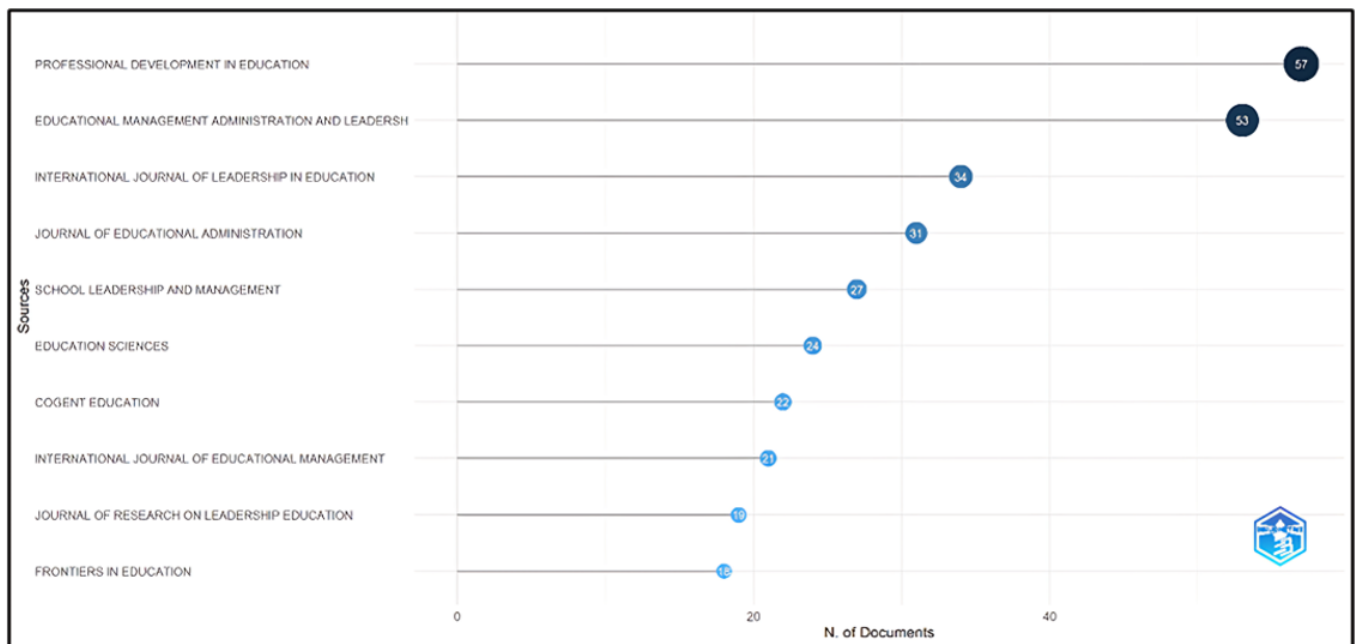


Figure 5. Top 10 journals publishing relevant studies (Source: Authors' own elaboration, using Biblioshiny)

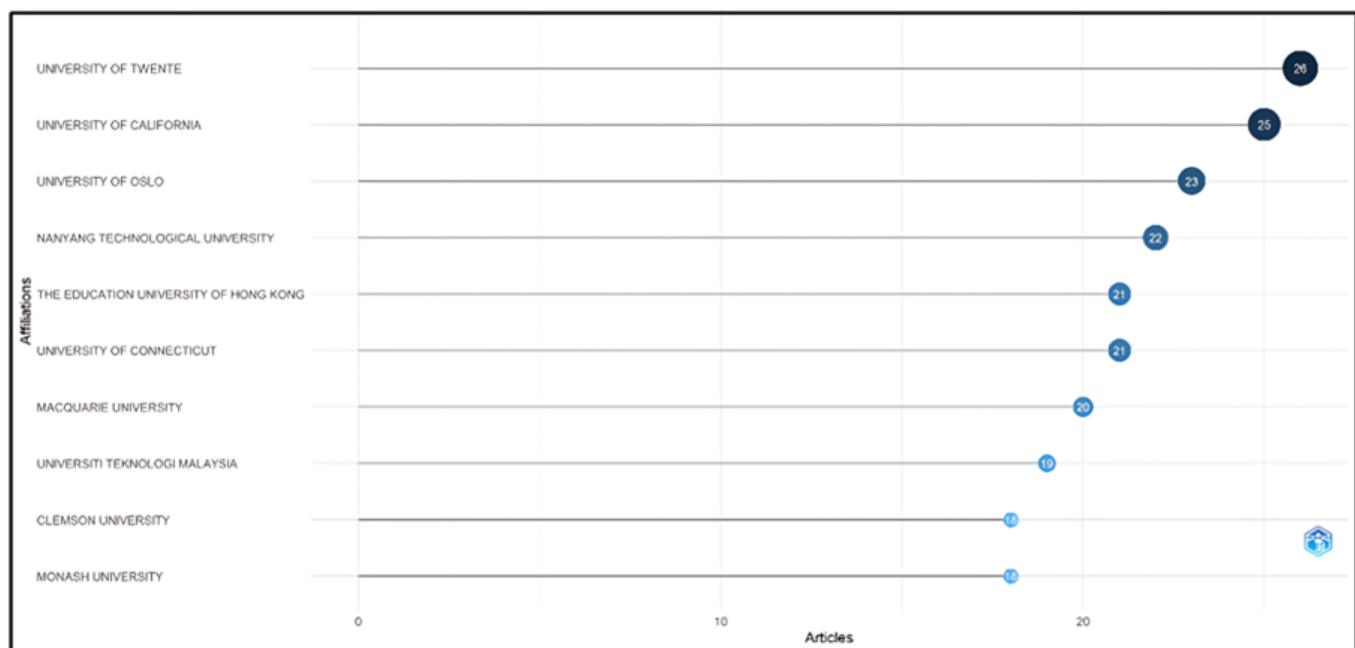


Figure 6. Top 10 institutions contributing to research (Source: Authors' own elaboration, using Biblioshiny)

of Leadership in Education (34 documents), Journal of Educational Administration (31), and School Leadership and Management (27). Journals such as Education Sciences, Cogent Education, International Journal of Educational Management, Journal of Research on Leadership Education, and Frontiers in Education demonstrate strong contributions, reflecting a multidisciplinary approach to studying professional development for school leaders. Furthermore, the top 10 most relevant institutions in this field of study are presented in Figure 6.

Figure 6 presents the most active institutional affiliations. The University of Twente leads with 26 publications, followed by the University of California and the University of Oslo with 23 publications each. Nanyang Technological University (22),

the Education University of Hong Kong (21), and the University of Connecticut (21) are also significant contributors. Other active institutions include Macquarie University (20), Universiti Teknologi Malaysia (19), Clemson University (18), and Monash University (18), illustrating a diverse representation from Western Europe, North America, East Asia, and Southeast Asia. Meanwhile, the results of the country analysis from the corresponding authors are presented in Figure 7.

Figure 7 presents the geographical distribution of the fields of study based on the related authors. The United States ranks highest with 254 publications, a dominant share of single country publications at 94.5%, and a smaller proportion of multiple country publications (MCP) at 5.5%. Australia

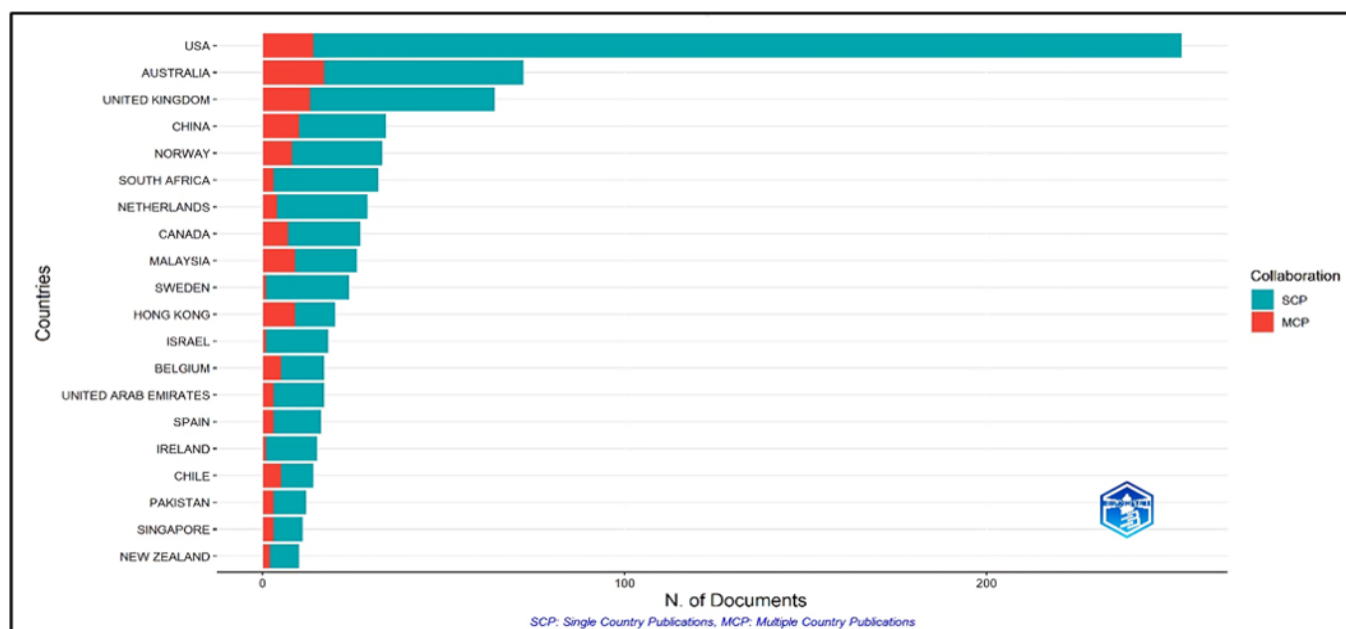


Figure 7. Countries of origin of the corresponding authors (Source: Authors' own elaboration, using Biblioshiny)

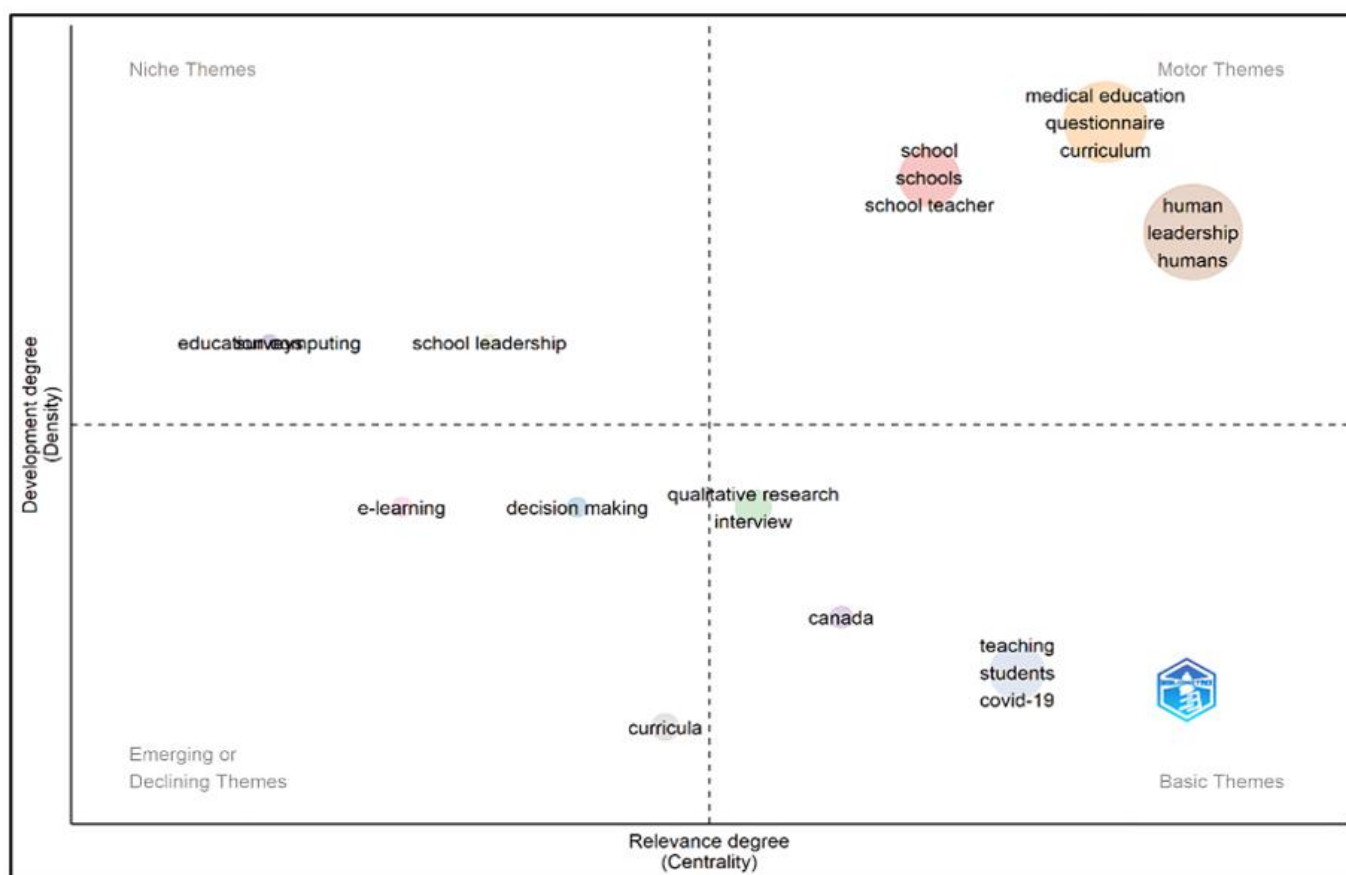


Figure 8. Thematic map of research (Source: Authors' own elaboration, using Biblioshiny)

follows with 72 publications (MCP: 23.6%), and the United Kingdom with 64 (MCP: 20.3%). China (34; MCP: 29.4%) and Norway (33; MCP: 24.2%) also contribute significantly. Other notable contributors include South Africa, the Netherlands, Canada, Malaysia, Hong Kong, the UAE, Pakistan, and Singapore, exhibiting high levels of international collaboration. Countries such as Sweden, Israel, Belgium, Spain, Ireland, Chile, and New Zealand round out the top 20,

highlighting the global scope and diverse collaborative patterns in school leadership research.

Thematic Clusters, Emerging Topics, and Thematic Shifts

The thematic mapping generated using R-Biblioshiny is illustrated in Figure 8, which categorizes frequently occurring keywords into four quadrants.

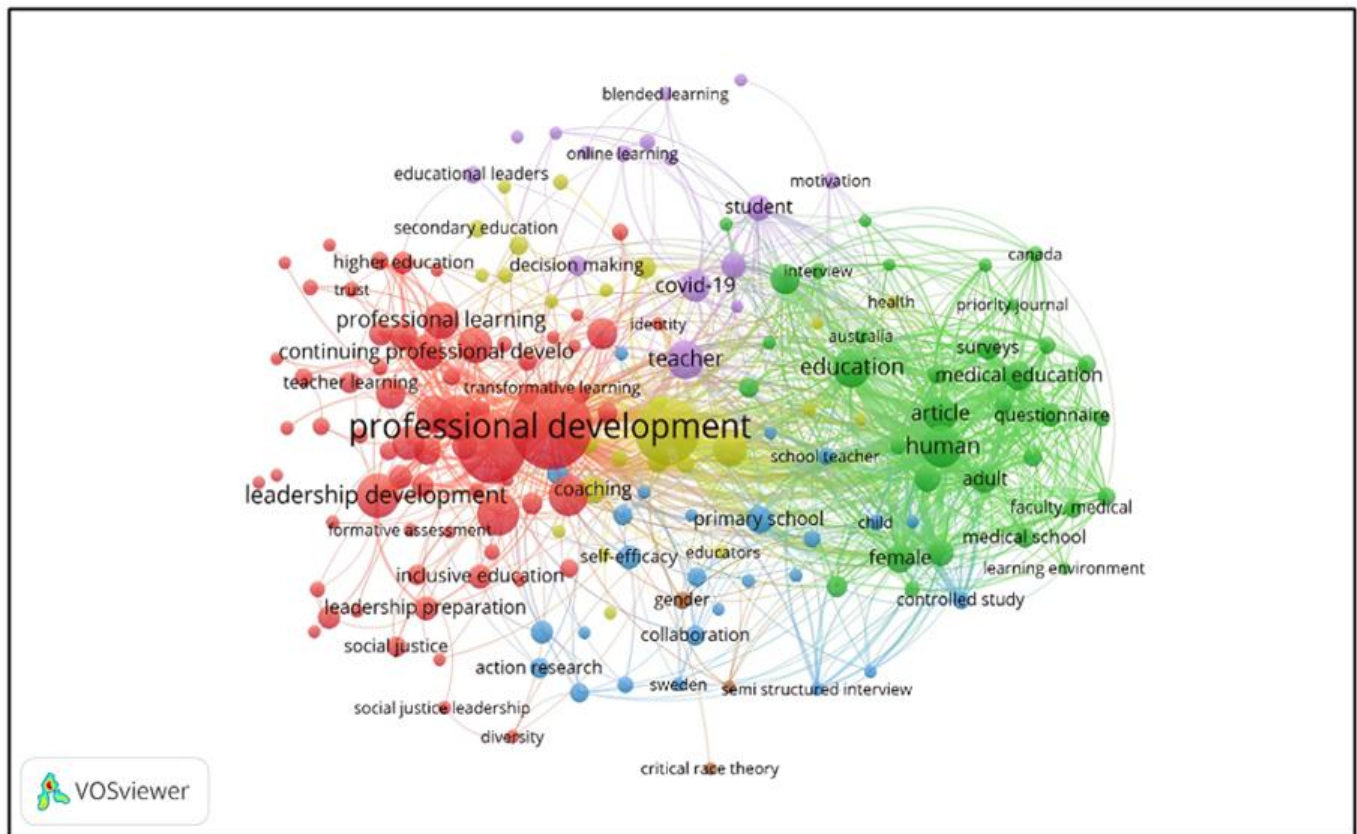


Figure 9. Keyword co-occurrence network visualization (Source: Authors' own elaboration, using VOSviewer)

Figure 8 shows the distribution pattern of keywords frequently used in published articles across four quadrants. The motor themes quadrant (top right) includes terms such as human, leadership, medical education, curriculum, and questionnaire, indicating areas of importance and well-developed. The specialized themes quadrant (top left) contains specific terms such as school leadership, education systems, and computing. Foundational themes (bottom right) include teaching, students, COVID-19, and schools, representing basic concepts. The emerging or declining themes quadrant (bottom left) includes e-learning, decision-making, and curriculum, indicating areas of potential development or declining interest. Furthermore, the results of the keyword co-occurrence analysis displayed in the network visualization using VOSviewer are presented in **Figure 9**.

The co-occurrence analysis visualized in **Figure 9**, using VOSviewer, identifies six main thematic clusters. Cluster 1 (red) is the largest, with 70 keywords, including professional development, school leadership, leadership development, instructional leadership, and education policy. Cluster 2 (green) comprises 34 keywords: education, human, medical education, and learning environment. Cluster 3 (yellow) includes 26 keywords focused on coaching, mentoring, school management, and technology integration. Cluster 4 (blue) features 25 terms: primary school, teacher training, inclusion, and capacity building. Cluster 5 (purple) includes 16 keywords like burnout, motivation, blended learning, and online learning. Cluster 6 (brown) is smaller, consisting of only three keywords: gender, race, and critical race theory, indicating emerging intersections between leadership and social justice themes.

Potential Themes for Future Research

The overlay visualization of keyword co-occurrence in **Figure 10** reveals the rise of emerging research themes, particularly from 2023 to 2024. Keywords highlighted in yellow, such as sustainability education, well-being, digital transformation, professionalism, teacher motivation, innovation, and professional identity, signify growing interest in these areas. More established terms such as leadership development, education, and school leadership appear in green or blue, reflecting their sustained relevance over time. Furthermore, the results of the trend topic analysis that support this finding are presented in **Figure 11**.

Figure 11 shows a number of keywords that show trend research topics in this field by time. Early themes (2015-2018) include radiology and standards, while terms such as education, medical, and graduate dominate the 2016-2020 range. Keywords like curriculum, human experiment, medical education, and personnel management gained traction between 2018 and 2024. Other consistent entries include psychology, learning, child, school, and schoolteacher, which emerged during 2020-2023. The evolution of these terms illustrates a thematic shift towards interdisciplinary connections, human-centered leadership, and the increasing integration of digital and psychological dimensions within leadership training research.

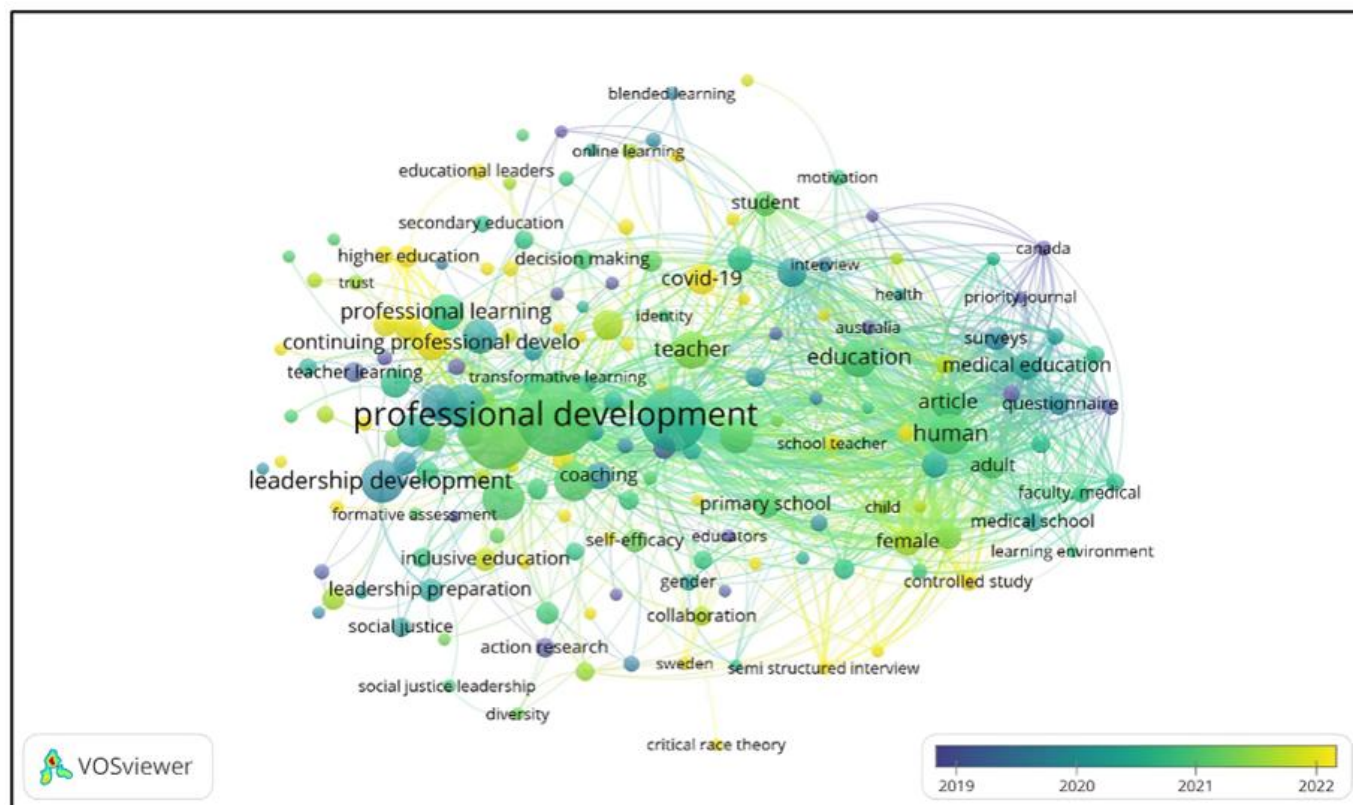


Figure 10. Keyword co-occurrence overlay visualization (Source: Authors' own elaboration, using VOSviewer)

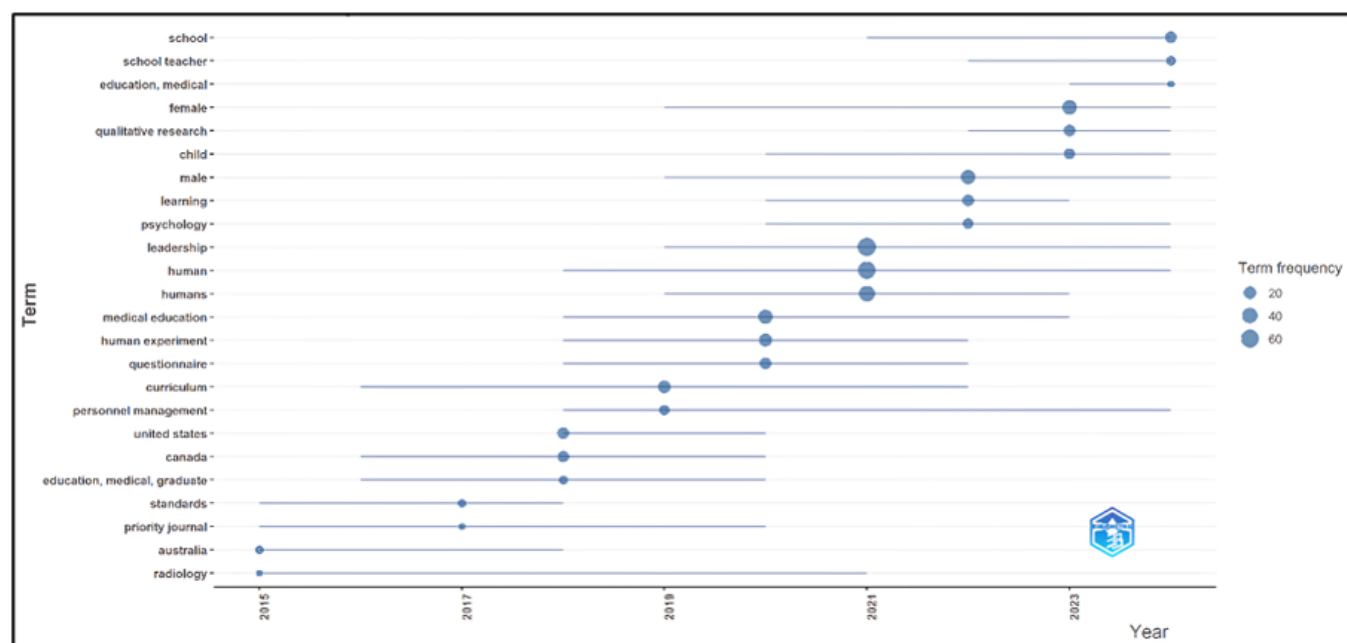


Figure 11. Keyword trend analysis (Source: Authors' own elaboration, using Biblioshiny)

DISCUSSION

Annual Publication Trends in School Leadership Development Research (2015-2025)

The rising trend in publications from 2015 to 2023 confirms that school leadership development is increasingly gaining recognition as a critical area within global educational research. This upward trajectory reflects growing academic

interest and responds to the evolving dynamics and multifaceted challenges facing education systems worldwide. The substantial surge in 2024 appears closely tied to the heightened demand for adaptive and visionary educational leadership in the post-COVID-19 era. During this period, school leaders were required to respond swiftly to crises, implement remote learning systems, and prioritize the well-being of school communities (Caño et al., 2023; Sato et al., 2024).

Moreover, the trend reflects a broader transformation in the role of school leaders—from administrative functionaries to change agents who emphasize professional learning, data-informed practices, and evidence-based decision-making (Aas, 2017; Farley-Ripple, 2024). The increase in scholarly output also illustrates a heightened awareness of the critical importance of leadership capacity-building. Dian et al. (2022) noted that effective school leadership can foster dynamic learning environments and significantly enhance educational quality. The apparent decline in 2025 should be interpreted cautiously, as the data for this year remains incomplete. Overall, the trend underscores sustained scholarly engagement with school leadership development, especially concerning digital transformation, leadership professionalization, and crisis management—issues that demand robust and responsive leadership practices.

Key Contributors and Geographic Distribution

Identifying prolific and high-impact authors reveals a constellation of influential scholars shaping the discourse in school leadership development. Aas, M. and Schildkamp, K. emerge as pivotal contributors due to their publication volume and the scholarly impact of their work. Schildkamp, K.'s focus on data-informed leadership has resulted in highly cited studies, underscoring the value of empirical, contextually relevant research. Additional contributors, such as Hallinger, Dos Santos, Irby, and Postholm, further enrich the field through diverse theoretical perspectives and regional insights.

Influential contributions from Daniëls et al. (2019) and Van Mieghem et al. (2018), highlight a growing emphasis on inclusive and transformative leadership paradigms. Similarly, Schildkamp, K.'s work affirms the relevance of data-driven leadership in enhancing school effectiveness (Schildkamp & Poortman, 2015; Schildkamp et al., 2016). Digital transformation, as explored by Hatlevik et al. (2015) and Pettersson (2021), represents another central thread of inquiry, while scholars like Walker and Hallinger (2015), Marsh et al. (2015), and Grootenboer et al. (2015) emphasize collaboration, contextual leadership, and pedagogical leadership. These findings show that scholarly influence in this field is not merely a function of publication quantity, but also of conceptual contribution and practical resonance.

Institutionally, the University of Twente and the University of California lead in publication output, signaling their roles as hubs of excellence in educational leadership research. Institutions such as the University of Oslo, Nanyang Technological University, the Education University of Hong Kong, the University of Connecticut, and Macquarie University also show firm productivity, highlighting the geographic diversity and global research reach in this area. Meanwhile, contributions from Universiti Teknologi Malaysia, Clemson University, and Monash University indicate the increasing participation of institutions in Southeast Asia, North America, and Oceania, adding to the diversification of global knowledge production.

Regarding publication venues, journals such as *Professional Development in Education* and *Educational Management Administration & Leadership* dominate, focusing on leadership practice, policy, and school-based improvement. The *International Journal of Leadership in*

Education, *Journal of Educational Administration*, and *School Leadership and Management* reinforce the emphasis on schools as key sites for educational leadership. Interdisciplinary journals like *Education Sciences* and *Frontiers in Education* provide broader methodological and thematic coverage. In contrast, open-access journals such as *Cogent Education* and *International Journal of Educational Management* facilitate the dissemination of contemporary perspectives, especially from and to developing regions.

Geographically, the United States holds a dominant position in terms of research output, although the majority is conducted through domestic collaboration. Conversely, countries such as Malaysia, Hong Kong, and Chile exhibit high levels of international collaboration, indicating strategic efforts to expand research impact. This trend highlights the significance of transnational networks in enhancing the cross-contextual applicability and practical relevance of school leadership research.

Thematic Clusters, Emerging Topics, and Thematic Shifts

The network visualization of thematic clusters reveals that research in school leadership is evolving in increasingly complex and multidimensional directions. The largest cluster confirms that professional development, instructional leadership, and continuous learning remain core concerns in global leadership discourse. This finding suggests sustained scholarly focus on capacity-building through professional learning communities, leadership preparation, and distributed leadership models (Galdames-Calderón, 2023; Liu & Hallinger, 2018).

A second cluster links school leadership with higher education, particularly in medicine and psychology. Keywords such as medical education, personnel management, and learning environment reflect an interdisciplinary expansion of leadership research into vocational and health-related education contexts (van Diggele et al., 2020). A third cluster emphasizes technical training in basic education, with keywords such as coaching, mentoring, and secondary education, suggesting a shift toward more supportive and equity-focused leadership models.

Contemporary issues, including burnout, motivation, and online learning, are central to the fifth and sixth clusters, alongside critical perspectives such as gender, race, and critical race theory. As Vassallo (2022) asserts, school leaders must be equipped to navigate racial politics, foster culturally responsive practices, and champion socially just educational environments. Although quantitatively smaller, these clusters represent growing areas of inquiry in response to persistent structural inequalities and emerging sociocultural dynamics in education.

The thematic mapping further substantiates these findings. Themes such as leadership, medical education, and curriculum are identified as motor themes, indicating their centrality and maturity. In contrast, topics like e-learning and decision-making are situated within the emerging or declining quadrant—either representing nascent developments or reactive themes that surged during the pandemic. Foundational concepts such as teaching and students remain vital as the bedrock upon which leadership studies continue to evolve.

Potential Themes for Future Research

The overlay visualization identifies a set of emerging keywords, particularly in 2023-2024, reflecting a shift in research interests toward more contextually grounded and forward-looking themes. Terms like sustainability education indicate opportunities to investigate how school leaders internalize and implement sustainability principles in school vision, policy, and community initiatives. This line of inquiry can explore project-based learning, stakeholder engagement, and the integration of environmental ethics in leadership practices.

The prominence of digital transformation and online teaching signals an urgent need for deeper exploration into how school leaders navigate post-pandemic digital innovation, ranging from policy development to capacity building for technological integration. Scholars such as Azukas (2022) and Karakose et al. (2024) stress the importance of digital competency and strategic innovation planning for school leaders in the post-COVID-19 era. Further, keywords such as well-being, teacher motivation, and professional identity present opportunities for investigating leadership's affective and psychosocial dimensions. In context of increasing teacher workload and burnout, research should examine how leadership practices can foster supportive environments and strengthen educators' sense of purpose and professional belonging (Lee & Swaner, 2023). This finding also opens up space for research on professional ethics and the evolving social roles of educational leaders.

The emergence of higher education and critical race theory broadens the scope of leadership research both vertically (across educational levels) and conceptually. Higher education leadership studies can explore institutional culture, curriculum reform, and cross-disciplinary collaboration (Tian & Risku, 2018), while critical race theory introduces a social justice lens through which to examine equity, representation, and resistance within school leadership structures (Horsford et al., 2019).

Trend topic analysis reinforces these insights, showing the steady emergence of keywords such as leadership, school, humans, gender, and learning since 2019. These shifts reflect a broader turn toward leadership's psychological, social, and relational dimensions, beyond bureaucratic models and into identity, interaction, and care (Fuselier & Beatty, 2023). These trends align with efforts to bridge pedagogical concerns and leadership, particularly in digitalization and post-pandemic recovery (Karakose et al., 2024; Weng et al., 2024).

The integration of overlay visualization and trend topic analysis reveals several promising directions for future research. First, future research may focus on how school leaders navigate curriculum changes in response to global pressures, the demands of digitalization, and social uncertainty. This study can explore the adaptive strategies leaders use in formulating contextual learning policies, curriculum content updates, and project-based learning integration relevant to the value of sustainability and digital transformation. Second, more in-depth studies can focus on leadership styles based on emotional intelligence and motivation to improve well-being and support the professional identity of teachers and principals. This research can

potentially develop a conceptual framework for supportive leadership oriented towards human welfare as the foundation of educational organizations.

The third research opportunity, which can be done next, is to examine more deeply how education leaders apply the principles of social justice, critical race theory, and gender and ethnic equality in their managerial practices. The research focuses on policies, school culture, and leadership interventions that create safe, equitable, and supportive learning spaces for all school residents, especially marginalized groups. Finally, with the emergence of the theme of higher education, medical education, and personnel management, research can be directed at transforming the role of leaders at the higher education and professional levels. This study is important to understand how academic leadership shapes institutional culture, supports interdisciplinary collaboration, and manages the dynamics of professional curriculum in an ever-changing global context.

CONCLUSIONS

This study examined publication trends, citation dynamics, collaboration networks, thematic evolution, and potential future research directions in school leadership development from 2015 to 2025. The findings reveal a marked increase in the volume of publications, particularly after 2020, with a peak observed in 2024. Authors such as Aas, M. and Schildkamp, K. emerged as leading contributors, with Schildkamp, K.'s work also demonstrating significant academic impact through highly cited publications. Based on citation analysis, Daniëls, E. and Van Miegheem, A. were identified as the most influential figures in this field, underscoring their pivotal role in shaping scholarly discourse on school leadership.

Prominent journal sources supporting this field include *Professional Development in Education* and *Educational Management Administration & Leadership*, consistently serving as key publication platforms. Institutional affiliations of leading authors are predominantly concentrated in Western Europe, North America, and Asia, with the University of Twente, the University of California, and the University of Oslo leading in terms of output. Regarding country-level contributions, the United States, Australia, and the United Kingdom dominate scholarly production. Countries such as Malaysia and Hong Kong have shown increasing visibility through strong international collaborations, signaling their growing engagement in global academic networks.

Thematic analysis identified six major clusters, reflecting a broad and evolving research landscape that includes professional development, instructional leadership, digitalization, and inclusive education. Thematic mapping and keyword trend analysis indicate a paradigm shift in leadership research—from managerial and administrative approaches to more humanistic, sustainable, and socially responsive models. Emerging themes for future research include leadership strategies for curriculum adaptation in response to global challenges and digital transformation; leadership models that support educator well-being and motivation; inclusive and equity-focused leadership that addresses diverse social identities; and leadership practices across educational levels,

particularly within higher and professional education contexts.

Despite its contributions, this study has certain limitations. The analysis was restricted to the Scopus database, potentially omitting relevant literature from other indexing services such as Web of Science or ERIC. Furthermore, as a bibliometric review, the study offers a macro-level perspective but does not delve into empirical insights or the effectiveness of specific leadership practices. Future research could address these limitations by broadening the range of data sources and integrating original, empirical investigations that explore the identified themes in greater depth. Such follow-up studies will be essential for advancing the theoretical and practical understanding of school leadership in increasingly complex educational environments.

Author contributions: RAMH, AP, MA, & AF: conception and design of the study; RAMH: conceptualization, methodology, software, original draft preparation, and review and editing; AP: validation; MA: supervision; & AF: formal analysis and investigation. All co-authors agree with the results and conclusions.

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Ethical statement: The authors stated that the study is a bibliometric analysis based on publicly accessible data retrieved from the Scopus database. Ethical approval was not necessary, as the study did not engage human subjects, handle personal information, or conduct experimental interventions. The authors further stated that all information was obtained through authorized academic means and examined following recognized ethical research guidelines. All referenced sources in the analysis have been appropriately cited and acknowledged.

AI statement: The authors stated that, during the writing process, artificial intelligence (AI) technologies contributed to refining the manuscript's clarity and flow. For instance, ChatGPT-4o assisted in reviewing the text to enhance its readability and structure, while Grammarly aided in addressing grammar and language precision. The application of these tools was limited to editorial support and did not affect the research's originality, interpretation, or core findings.

Declaration of interest: No conflict of interest is declared by the authors.

Data sharing statement: Data supporting the findings and conclusions are available upon request from the corresponding author.

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