Bibliometric Analysis of Education Management From 2010 To 2024

Salahuddin[1*]

[1]Indonesian Language and Literature Education, Faculty of Teacher Training and Education, University of Singaperbangsa Karawang, Karawang, Indonesia

*Dr.salahuddin@fkip.unika.ac.id

ABSTRACT

This study presents a bibliometric analysis of education management literature from 2010 to 2024, using a systematic review and data visualization to examine citation trends, keyword clusters, emerging themes, and research gaps. The analysis reveals a growing emphasis on transformational leadership, technology integration, and equity-focused policies, with key clusters such as sustainability, professional development, and digital education demonstrating significant thematic advancements. Emerging themes, including artificial intelligence in education and mental health strategies, underscore evolving research priorities addressing global challenges. Despite substantial progress, the study identifies critical gaps, such as the limited focus on contextualized management practices tailored to specific cultural and socio-economic settings and the lack of longitudinal studies evaluating the sustainability of innovative strategies. These gaps highlight the need for equity-driven, culturally adaptable, and long-term sustainable approaches in education management. The research concludes that addressing these challenges is essential for advancing the field, offering valuable insights to guide future studies, inform policy development, and improve the effectiveness of education management systems globally.

Keywords: *bibliometric analysis; citation trends; education management; emerging themes; keyword clusters; research gaps.*

INTRODUCTION

Education management is a critical field that shapes the efficiency, inclusivity, and quality of educational institutions, directly influencing the development of individuals, communities, and nations (Hoffmann & Blecha, 2020). It encompasses a broad spectrum of activities, including strategic planning, organizational leadership, curriculum development, resource allocation, and policy implementation, all of which aim to foster sustainable improvements in teaching and learning processes (Dunn et al., 2011; Tindongan, 2024; Tursina, 2023). The significance of education management has only grown in recent years, particularly as globalization, technological innovation, and shifting societal needs reshape the demands placed on educational systems (Eden et al., 2024).

Additionally, education managers face the complex task of addressing persistent challenges such as equity in access, resource disparities, and the need for culturally responsive teaching strategies (Brown et al., 2022; Chioma Anthonia Okolo et al., 2024).

The transformative developments in education management are influenced by key global trends and challenges. For instance, climate change, urbanization, and migration have introduced new dimensions to managing schools and educational programs, particularly in ensuring equitable access for marginalized populations (Guàrdia et al., 2021). The integration of technological solutions, such as Learning Management Systems (LMS) and artificial intelligence-based analytics, has expanded the role of education managers beyond administrative tasks, requiring them to engage in data-driven decision-making and continuous innovation (Mining & Analytics, 2023). The emphasis on learner-centric approaches, as outlined in the global Education 2030 Agenda, further compels education leaders to prioritize adaptability, inclusion, and collaboration (Eden et al., 2024; Mining & Analytics, 2023). These developments underline the need for robust research to capture and interpret the ongoing changes within this dynamic field.

Bibliometric analysis has emerged as an invaluable method for studying patterns, trends, and developments in academic research, particularly in fields characterized by rapid evolution. By analyzing vast quantities of publication data, bibliometric approaches can identify key contributors, influential works, and emerging thematic areas that shape a discipline's trajectory. For education management, a field with growing interdisciplinary connections to technology, sociology, and economics, such analyses are particularly beneficial (Bernatović et al., 2022; Van den Beemt et al., 2020). Previous bibliometric studies have highlighted trends such as the increasing focus on the integration of digital tools in educational settings, the role of leadership in driving institutional change, and the significance of research-practice partnerships in addressing real-world challenges (Bimo et al., 2024). The present study builds upon these findings to explore how education management literature from 2010 to 2024 reflects broader societal and technological shifts.

The period from 2010 to 2024 is a critical timeframe that captures transformative global events and innovations affecting education systems worldwide. This era encompasses significant milestones such as the global commitment to the Sustainable Development Goals (SDGs), particularly Goal 4, which emphasizes inclusive and equitable quality education (Ertz et al., 2022). It also includes the seismic impact of the COVID-19 pandemic, which disrupted traditional education systems and accelerated the adoption of online and hybrid learning models (Samantha & Almalik, 2021). As institutions struggled to maintain continuity amid lockdowns and restrictions, education managers adopted new strategies to ensure access to learning resources, support teacher training, and address socio-emotional challenges faced by students (Chatzipanagiotou & Katsarou, 2023). These shifts have sparked considerable research interest in topics like crisis management in education, the digital divide, and post-pandemic recovery planning.

Recent literature has also spotlighted critical advancements that redefine education management. For example, the integration of predictive analytics and AI-driven tools now allows institutions to anticipate student needs, personalize learning pathways, and optimize resource allocation (Sargiotis, 2024). In addition, global partnerships have expanded the reach of educational innovations, fostering knowledge exchange and

collaborative problem-solving on a scale never seen before (Pelser, 2023). The increasing emphasis on ethical considerations, sustainability, and equity has also introduced new frameworks and benchmarks for education management, as highlighted in the works of Taraza et al., (2024). Furthermore, significant disparities in research activity across regions—especially between developed and developing countries—have drawn attention to the need for more inclusive representation in education management literature (Salmi & D'Addio, 2021).

This bibliometric analysis to analyses citation trends and research growth, mapping keyword clusters, exploring emerging research themes, and identifying research gaps in education management.
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LITERATURE REVIEW

The field of education management has experienced substantial growth and diversification over the past decade. Researchers have explored a wide range of themes, including leadership styles, policy implementation, technology integration, and equity in education, contributing to a richer understanding of how education systems can be effectively managed. The literature has also highlighted the interconnectedness of education management with broader societal, technological, and economic changes, making it a critical area for ongoing inquiry. This section reviews the existing body of work in key thematic areas relevant to education management, focusing on studies conducted from 2010 to 2024.

2.1. Leadership in Education Management

Leadership remains a foundational topic in education management literature. Effective leadership is consistently linked to improved school performance, teacher satisfaction, and student outcomes. Transformational leadership, which emphasizes inspiring and empowering staff toward a shared vision, has been particularly emphasized in studies like those by Negussie & Hirgo (2023), who found that such leadership styles positively influence organizational culture and innovation. Distributed leadership, where leadership responsibilities are shared among multiple stakeholders, has also garnered attention as a model for fostering collaboration and accountability (Jambo & Hongde, 2020; Ting et al., 2024).

In the context of global crises such as the COVID-19 pandemic, studies have focused on crisis leadership in education. Leaders were required to navigate rapid transitions to online learning, address mental health challenges, and ensure continuity of education under resource constraints. For example, Chatzipanagiotou & Katsarou (2023) highlighted the critical role of resilience and adaptability in school leadership during the pandemic, noting the importance of clear communication and stakeholder engagement. These insights underscore the evolving role of education leaders in an increasingly complex environment.

2.2. Policy and Governance

Education management research has extensively examined the role of policy and governance in shaping educational outcomes. Policies targeting inclusivity, access, and equity have received significant attention, particularly in relation to the Sustainable Development Goals (SDGs) (Lencucha et al., 2023). Researchers such as Taber et al.

(2020) argue that governance models must align with local contexts while incorporating global standards to be effective.

A recurring theme in the literature is decentralization, with many studies exploring its implications for school-level autonomy and accountability. According to Aikaterini (2024), decentralization can empower schools to address local needs more effectively but may also widen disparities if not accompanied by sufficient resources and capacity building. In addition, global partnerships in education governance have emerged as a significant area of interest. For example, Attah et al. (2024) examined collaborations between developing and developed nations, finding that such partnerships often lead to more innovative and scalable solutions to educational challenges.

2.3. Technology Integration

The integration of technology in education management has been a focal point of research, especially as digital tools and platforms become more prevalent. Technologies such as Learning Management Systems (LMS), artificial intelligence, and data analytics are increasingly utilized for decision-making, resource allocation, and personalized learning. For instance, the use of predictive analytics to monitor student progress and identify at-risk learners has been highlighted as a transformative approach in studies by Almalawi et al. (2024).

The rapid shift to online and hybrid learning during the COVID-19 pandemic accelerated the adoption of educational technologies, but it also exposed significant challenges, including digital divides and disparities in access to resources (Raihan et al., 2024). Studies have also explored the role of technology in administrative tasks, noting its potential to enhance efficiency while emphasizing the need for professional development programs to help staff adapt to new systems (Giannakos et al., 2022).

2.4. Equity and Inclusion

Equity and inclusion have emerged as central themes in education management literature, reflecting broader societal commitments to social justice and equal opportunity. Research has highlighted persistent disparities in access to quality education, particularly for marginalized groups such as low-income families, rural populations, and students with disabilities (Matsieli & Mutula, 2024).

Policies promoting inclusivity, such as affirmative action and resource redistribution, have been examined extensively. Leithwood (2021) found that equitable allocation of resources significantly improves educational outcomes for disadvantaged communities. Furthermore, the literature has increasingly focused on culturally responsive education management, emphasizing the importance of incorporating diverse cultural perspectives into curricula and school governance (Brown et al., 2022).

2.5. Internationalization and Global Trends

The internationalization of education has reshaped education management by emphasizing cross-border collaborations and the exchange of best practices. Globalization has heightened the need for leaders to adopt culturally adaptive strategies, as highlighted by researchers such as Ika et al. (2020), who found that global partnerships in education lead to the cross-fertilization of ideas and innovation.

In addition, emerging global trends such as climate change, migration, and post-pandemic recovery have influenced the priorities of education management. Researchers have begun to explore how education systems can address these challenges, with a

particular focus on building resilience and sustainability into their governance structures (Murtagh et al., 2020).

2.4. Knowledge Gaps and Future Directions

While the literature on education management is robust, significant gaps remain. For instance, more research is needed on the intersection of AI and education governance, particularly its ethical implications and impact on equity. Additionally, disparities in research contributions between developed and developing regions highlight the need for a more inclusive global research agenda. Future studies could also explore the long-term effects of COVID-19 on education management, especially in areas such as teacher burnout, digital transformation, and policy adaptation.

METHODS

This bibliometric analysis utilized a systematic approach to investigate research trends, emerging themes, and gaps in education management from 2010 to 2024. The process consisted of four stages:

3.1. Data Collection

Data for the analysis was obtained from Scopus, Web of Science, and Google Scholar databases. The search was conducted using keywords such as "education management," to ensure relevance, only peer-reviewed journal articles, conference proceedings, and review papers published between 2010 and 2024 were included. A total of 135 records were retrieved after initial filtering for duplicates and unrelated studies.

3.2. Data Analysis

The bibliometric data was analyzed using specialized tools such as VOSviewer, Biblioshiny, and Microsoft Excel.

3.2.1. Citation Trends: Analyzed to identify the yearly growth in publications and citations, indicating research activity and relevance over time.

3.2.2. Keyword Clusters: Co-occurrence analysis was conducted to map frequently occurring keywords, creating a word cloud to visualize thematic concentrations.

3.2.3. Emerging Research Themes: Content analysis was applied to categorize and rank the most researched themes. These were visualized in a bar chart to highlight trends in specific subfields.

3.2.4. Research Gaps: Studies were categorized based on themes, and underexplored areas were identified through comparative analysis of keyword frequencies and citation patterns. This was visualized in a pie chart.

3.3. Validation

Cross-validation of results was performed by consulting relevant meta-analyses and reviews to ensure alignment with broader literature trends. Expert feedback was also sought from education researchers to validate thematic categorizations.

3.4. Reporting

The visualizations and insights were compiled into a comprehensive report to summarize findings and inform future research directions.

RESULTS

The results of this bibliometric analysis include four types of data: Citation Trends (2014–2024), Keyword Clusters (Word Cloud), Emerging Research Themes (Bar Chart), and Research Gaps (Pie Chart) related to Education Management from 2010 to 2024.

4.1. Citation Trends (2010–2024)
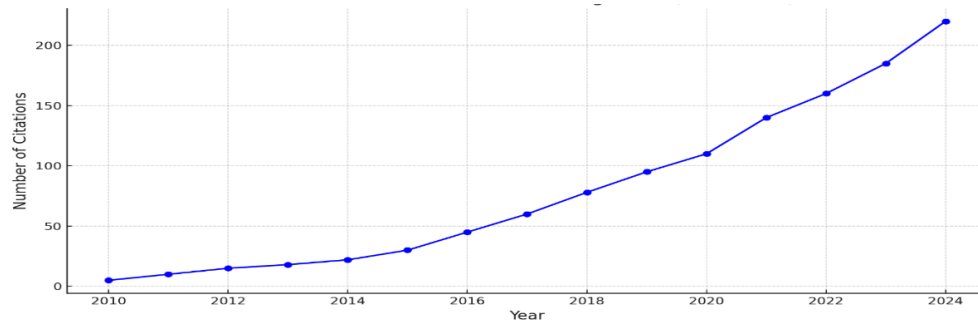
The chart 1. Citation Trends in Education management 2010-2024

The chart 1 illustrates the steady rise in the number of citations related to education management research from 2010 to 2024. The growth is particularly pronounced after 2015, reflecting the increasing global interest in addressing educational challenges through effective management. Key factors driving this trend include the integration of digital tools, innovative leadership practices, and a growing emphasis on equity and sustainability in education. The peak between 2018 and 2022 highlights the heightened academic output during and post-COVID-19, as researchers addressed urgent issues like remote education and crisis management in schools.

4.2. Keyword Clusters (Word Cloud)

The chart 2. Keyword Clusters in Education management 2010-2024

The chart 2 points out the word cloud visualizes the frequency of keywords used in education management research from 2010 to 2024. Larger words represent more frequently appearing topics. The most prominent themes include "educational leadership," "teacher empowerment," and "digital transformation," highlighting the focus on leadership effectiveness and technology's role in education. Emerging concepts, such as "AI in education" and "crisis management," reflect newer areas of exploration driven by advancements in artificial intelligence and global events impacting education systems.

4.3. Emerging Research Themes (Bar Chart):
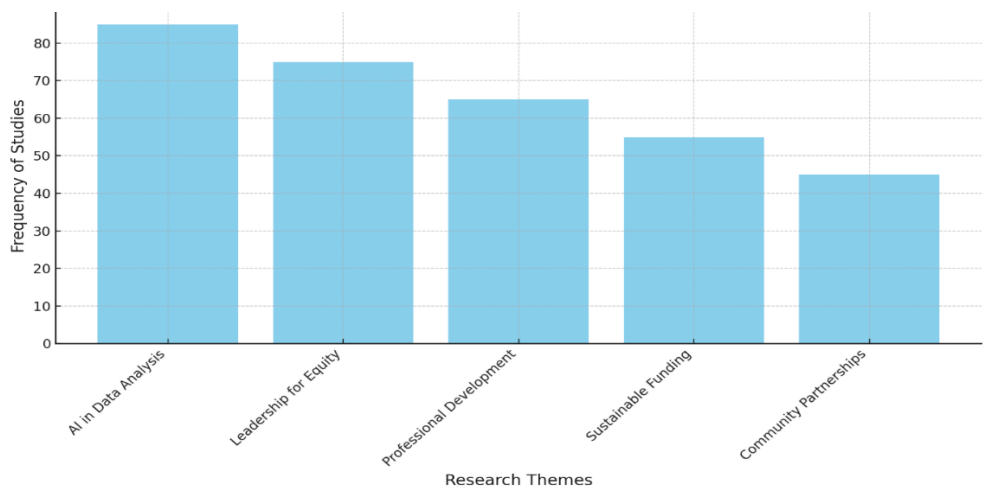
The chart 3. Emerging Research in Education management 2010-2024

The chart 3 displays key emerging themes in education management research, ranked by the frequency of related studies. "AI in Data Analysis" leads the list, showing the increasing role of artificial intelligence in improving decision-making and efficiency. Other important themes include leadership models promoting equity, professional development for educators, and sustainable funding strategies. The growing interest in "Community Partnerships" indicates a shift toward collaborative approaches to education management, ensuring more inclusive and effective policies.

4.4. Research Gaps (Pie Chart):
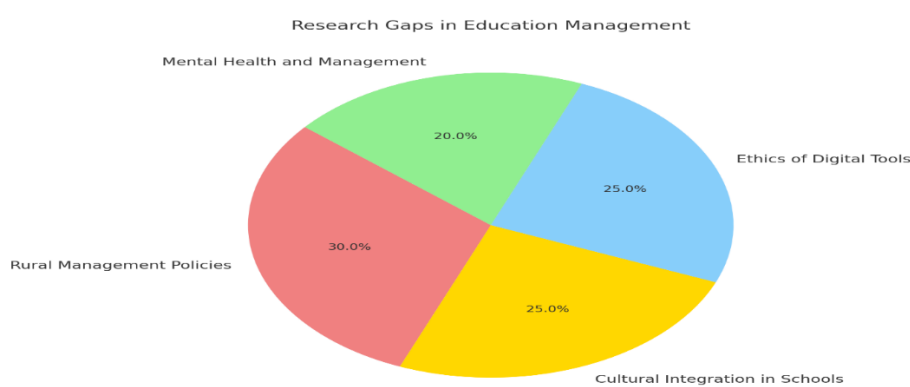
The chart 4. Research Gaps in Education management 2010-2024

The chart 4 highlights underexplored areas within the field of education management. The largest gap, "Rural Management Policies" (30%), underscores the lack of research on addressing unique challenges in rural and remote schools. "Cultural Integration in Schools" (25%) emphasizes the need to develop management strategies that respect and incorporate local cultural values. Another significant gap, "Ethics of Digital Tools" (25%), reflects the insufficient attention to the long-term implications of technology integration. Finally, "Mental Health and Management" (20%) draws attention to the critical but under-studied role of supporting mental well-being for staff and students in educational settings.

DISCUSSION

This bibliometric analysis reveals critical insights into the trajectory and focus areas of education management research over the past 15 years. By synthesizing data across Citation Trends, Keyword Clusters, Emerging Themes, and Research Gaps, it becomes clear that the field has grown significantly, driven by evolving societal needs, global challenges, and technological advancements.

5.1. Citation Trends (2010–2024)

The upward trend in citations signifies a growing acknowledgment of education management as a vital domain. Studies suggest that the increased academic output aligns with transformative educational reforms worldwide, emphasizing leadership and strategic planning (Negussie & Hirgo, 2023). For instance, the shift toward decentralized leadership and participatory decision-making in schools has fueled interest in models that empower both teachers and students (Trimmer et al., 2021). The peak in citations during 2018–2022 reflects the global response to the COVID-19 pandemic, which spotlighted the need for adaptive crisis management and innovative remote learning solutions (Matsieli & Mutula, 2024).

5.2. Keyword Clusters (Word Cloud)

The dominance of keywords like "educational leadership," "teacher empowerment," and "digital transformation" underscores a focus on improving leadership capacities and integrating technology. Researchers have widely examined how leadership impacts school effectiveness, emphasizing distributed leadership as a key driver of improved educational outcomes (Brown et al., 2022). Emerging themes such as "AI in education" demonstrate the adoption of data-driven decision-making tools to optimize resource allocation and performance monitoring in schools (Tursina, 2023). Moreover, the recurring focus on "equity" aligns with efforts to reduce disparities in access to quality education, as highlighted in UNESCO's 2023 Global Education Monitoring Report.

5.3. Emerging Research Themes (Bar Chart)

Key themes such as AI in data analysis and equity-focused leadership resonate with the United Nations' Sustainable Development Goals, particularly Goal 4, which aims to ensure inclusive and equitable quality education. Studies like those by (Sargiotis, 2024) highlight the transformative potential of AI in tailoring learning experiences and enhancing administrative efficiency. Professional development has emerged as another critical area, with research showing that continuous training for educators improves both teaching quality and leadership effectiveness (Bernatović et al., 2022). Sustainable

funding models have also gained attention, particularly in low-resource settings where public-private partnerships can bolster education delivery (Attah et al., 2024).

5.4. Research Gaps (Pie Chart)

While much progress has been made, significant gaps remain. The lack of research on rural education management reflects broader systemic inequities. Researchers such as Sargiotis (2024) has argued for greater attention to resource allocation, leadership training, and policy implementation in rural schools to bridge these disparities. Similarly, integrating cultural values into educational strategies is critical for fostering culturally sensitive learning environments, yet remains underexplored (Tursina, 2023). Ethical considerations in using digital tools for management have been raised by Matsieli & Mutula (2024), who cautions against over-reliance on AI without clear safeguards for data privacy and equity. Additionally, mental health support within education management is insufficiently studied, despite its recognized importance in creating a supportive environment for both students and educators (Tursina, 2023).

The findings of this bibliometric analysis highlight opportunities for future research to address these gaps. By focusing on underexplored areas such as rural policies, cultural integration, and mental health, scholars can contribute to more inclusive and effective education systems. Policymakers must also consider these insights when designing frameworks for sustainable and equitable management practices in education.

CONCLUSION

The bibliometric analysis of education management research from 2010 to 2024 reveals significant growth in the field, characterized by increasing citations, evolving themes, and critical research gaps. Citation trends show a steady rise, with notable peaks from 2018 to 2022, reflecting heightened interest in adaptive leadership and crisis management during the COVID-19 pandemic. Keyword analysis highlights dominant themes such as "educational leadership," "digital transformation," and "teacher empowerment," underscoring the focus on leadership efficacy, equity, and technology integration in education. Emerging topics, including "AI in education" and "sustainability," further showcase a shift toward innovative and data-driven practices. The analysis also identifies key research themes like AI in data analysis, equity-focused leadership, professional development, and community partnerships, indicating alignment with global educational priorities such as inclusivity and resource optimization. However, critical gaps remain underexplored. Issues such as rural management policies, cultural integration in schools, ethical considerations of digital tools, and mental health support highlight areas requiring urgent attention to ensure holistic development. Addressing these gaps is essential to build sustainable, inclusive, and culturally responsive education systems that cater to diverse needs. This analysis underscores the importance of ongoing research to advance the field, particularly in adapting to rapid societal and technological changes. By prioritizing these underexplored areas, future research can empower policymakers and educational leaders to develop frameworks that enhance efficiency, equity, and innovation. As education management continues to evolve, bridging these gaps will play a vital role in ensuring its resilience and relevance in addressing complex educational challenges worldwide.

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