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Educational Management Before, During, and After Covid-19: A Prisma-Based Statistical Systematic Literature Review

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ABSTRAK

The COVID-19 pandemic has brought fundamental changes to educational management systems and practices worldwide. However, studies that systematically map the development of educational management research before, during, and after the pandemic using a data-driven approach are still limited. This study aims to analyze trends, methodological approaches, and the focus of educational management research in the context of the COVID-19 pandemic using a Systematic Literature Review (SLR) approach based on the PRISMA 2020 guidelines. The main issue examined is how the pandemic has influenced the direction and paradigm of educational management research, particularly the shift towards quantitative and mixed methods approaches. Data were obtained through a literature search in Google Scholar, SINTA, and Scopus databases with a publication period of 2020–2024. Selected articles were analyzed using descriptive statistics to map the number of publications, types of research methods, and temporal trends. The results show a significant increase in the number of educational management publications during the 2020–2022 period, accompanied by a dominance of quantitative and mixed methods approaches. These findings indicate a paradigm shift towards data-driven research in response to the global crisis. This research makes an important contribution to the development of more adaptive and evidence-based educational management policies and practices in the post-pandemic era.

Keywords: COVID-19, Data-driven research, Educational management, PRISMA, Systematic literature review.

INTRODUCTION

The COVID-19 pandemic has created a historically unprecedented disruption for education systems internationally, forcing educational institutions to transform their management structures, governance models, and instructional delivery mechanisms. The Coronavirus (Covid-19) pandemic hit hard and interrupted many dimensions of our lives, especially education (Aristovnik, A et al., 2020), compelling a quick movement from traditional face-to-face learning to emergency remote teaching in 31 countries representing 62.7% of the world's population. It is worthy of examination as it is not only a pedagogical shift but also a systemic transformation in educational management involving leadership and policy implementation, organizational resilience, and technological integration. School Principals resorted to "reservoirs" of shared leader qualities, including personalized pragmatic communicators, with flexibility, creativity, and care; bending rules and shifting priorities; showing resilience under pressure to tide over the most unprecedented crisis they faced (Reyes-Guerra et al., 2021). Transformation has gone beyond individual leadership to the organizational structures, as well as 'the transformation of teaching and learning in higher education institutions using digital technology and literacy (Adiyono, A et al., 2024).

Implementation faced however, critical barriers, including poor training, inadequate infrastructure and resources, and limited access to internet platforms (Adiyono 2020; Okoye et al., 2022). Thus far, qualitative and quantitative approaches have been employed to document the changes; however, there remains an urgent need for data-driven, quantitative, and mixed-methods evidence with objective ability to capture patterns, trends, and magnitudes of change across time, particularly considering that "the COVID-19 pandemic was a real-time experiment wherein most countries instituted rapid change with little to no preparation in education delivery" (Rapanta et al., 2021). The COVID-19 pandemic has provided "an opportunity to rethink all assumptions about education in a broad sense and about higher education in particular," as well as "the necessity of their roles, ways of supporting students in learning tasks and the image of students as self-organising learners, active citizens and autonomous social agents" (Rapanta et al., 2021). Capturing those changes quantitatively is pertinent for evidence-based policy making and for future systems of education that are sustainable beyond the pandemic because research indicates that current practices can be defined as emergency remote practice, different from planned distance education, online learning (Adiyono et al., 2025), or other derivations. According to Bozkurt et al. (2020), the above evidence emphasizes the importance of widening evidence-based approaches to truly identify temporary crisis responses from long-term sustainable educational models.

Existing literature has extensively documented the emergency transition to online learning and the immediate managerial challenges faced during the pandemic, particularly through qualitative case studies, reflective analyses, and descriptive reports (Herrera-Pavo & Ornellas, 2024; Sosa-Daz et al., 2025; Wong et al., 2023). Numerous studies have explored teacher readiness, student perceptions, and technological barriers during COVID-19; however, these works are often fragmented, context-specific, and methodologically heterogeneous (Bond et al., 2021; Hamal & Aryal, 2022; Na & Jung, 2021). As one systematic review notes, "the shift to online learning exposed and worsened pre-existing inequities" while revealing that the unpreparedness of teachers and students for online instruction resulted in trial-and-error teaching methods (Nyarkoh, 2025). More importantly, prior research has predominantly focused on the during-pandemic phase, with limited systematic comparison across pre-pandemic, during-pandemic, and post-pandemic periods (Dedeilia et al., 2023; Ndofirepi, 2025; Orban et al., 2024). As emphasized in recent scholarship, "while many COVID-19 pandemic studies have focused on pre-post comparisons in the early pandemic stages," there remains insufficient longitudinal evidence examining "the long-term impacts of the pandemic" across distinct temporal phases (Orban et al., 2024). Additionally, few studies have synthesized quantitative and mixed-methods findings using a rigorous systematic framework such as PRISMA (Hagos et al., 2025; Karimi & Khawaja, 2025; Nicolas et al., 2025). The review highlights "a notable research gap in empirical studies validating' educational management responses in real-world settings, "particularly in developing countries," with "a critical need for comprehensive" frameworks that integrate findings across pandemic phases (Hagos et al., 2025). As a result, there is a lack of consolidated empirical evidence that maps how educational management research itself has evolved in response to the pandemic, revealing a significant gap that necessitates further investigation (Alecida et al., 2025; Chatzipanagiotou & Katsarou, 2023).

The purpose of this paper is to address these gaps by conducting a PRISMA-based Statistical Systematic Literature Review that synthesizes quantitative and mixed-methods (Singh, A., & Dass, S. (2025), studies on educational management before, during, and after the COVID-19 pandemic. Unlike previous reviews that emphasize narrative or qualitative synthesis, this study focuses on statistical patterns, research trends, and methodological shifts, thereby providing a comprehensive and comparative perspective across temporal phases. By systematically integrating findings from Google Scholar, Scopus, and SINTA databases, this paper aims to complete the shortcomings of existing literature by offering an evidence-based overview of how

educational management practices and research paradigms have transformed due to the pandemic.

This research seeks to substantiate the argument that the COVID-19 pandemic has altered educational management practices and, in fact, provided a flashpoint for a paradigm shift in educational management research toward data-driven paradigms. According to two recent systematic reviews, "The COVID-19 outbreak, along with post-pandemic impact, has prompted Internet Plus education to re-examine numerous facets of technology-oriented academic research", which was further demonstrated in "scientific shift from data-mining application to data-privacy and educational psychology, from general scanning to specific investigation" (Li & Jiang, 2021). This further narrows into the study of whether educational management studies have been significantly shifted into the intensive use of the quantitative and mixed methods during and post-pandemic as compared to before (Aziku & Zhang, 2024; Raharjo et al., 2024). Evidence from bibliometric analyses reconfirms that "there is increased in research on their wellbeing status" with "researchers mostly adopted quantitative methods in form of surveys (79.6%)" along with significant increase in "qualitative research accounting for 9.7% and mixed method research accounting for 10.7%" (Aziku & Zhang, 2024), conversely comprehensive reviews confirm a huge growth of empirical research post-pandemic with "quantitative trends further substantiate these relationships indicating medium to strong effect sizes" (Alecida et al., 2025). This research will seek to illustrate how educational management has developed into a field worthy of strategic engagement and empirical basis through an examination of publication trends and methodological orientations (Secreanu et al., 2025; Secreanu et al., 2024).

This goes on to demonstrate how the field of educational management is able to respond to global uncertainties with systematic methodologies employed in research analyses in educational management, along with the burgeoning interest in the use of AI in the educational field, bringing both significant opportunities (Secreanu et al., 2025). This shift makes further contributions toward adaptive and sustainable education systems in the post-pandemic era, where considerations of organizational resilience, especially in navigating post-pandemic challenges and promoting equity, have become focal in educational management research (Alecida et al., 2025; Bakar et al., 2024).

METHODS

This research method uses a Systematic Literature Review (SLR) approach that adheres to the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines to ensure the literature search, selection, and synthesis process is transparent, systematic, and

replicable (Adiyono et al., 2024). PRISMA is an international standard designed to maximize objectivity in reporting systematic reviews or meta-analyses by providing a framework that includes a search strategy, inclusion and exclusion criteria, and a flowchart of article selection from the initial search results to the final articles analyzed (Singh, A., & Dass, S., 2025). The latest PRISMA 2020 guidelines include a list of 27 items that must be met in reporting a systematic review to ensure methodological transparency and minimize bias in literature selection.

The SLR process begins with identifying literature sources through accessible academic databases, namely Google Scholar, Scopus, and SINTA, using a combination of specific keywords related to educational management, COVID-19, quantitative, and mixed methods. The initial search results from each database are exported (e.g., in RIS or CSV format) for documentation and auditing. An initial screening stage was then conducted on titles and abstracts to eliminate articles that were irrelevant, duplicate, or outside the scope of the study, such as those that did not use a data-driven approach or did not focus on educational management in the pandemic or post-pandemic context.

The next stage was an eligibility assessment, in which articles that passed the screening were read in full (full-text review) to ensure compliance with the inclusion criteria, including the publication period of 2020–2024, educational context, use of quantitative or mixed methods, and relevance of the topic to educational management. Articles that did not meet these criteria were excluded for reasons clearly documented in the PRISMA Flow Diagram. Finally, only articles that met all criteria were analyzed quantitatively and qualitatively by the research panel to produce a data synthesis and research trends.

In the data analysis, in addition to narrative descriptions, this study also used simple descriptive statistics to map the distribution of the number of publications per year, by research method, and trends in the use of quantitative and mixed approaches. This data is then visualized in graphs and tables depicting publication trends during the 2020–2022 period, supporting the interpretation that the research paradigm has shifted toward a data-driven approach in response to the impact of the COVID-19 pandemic on educational management systems and practices. This approach aligns with PRISMA's goal of producing studies that are not only comprehensive but also scientifically sound.

RESULTS

In a systematic literature review process following the PRISMA protocol, we identified and screened relevant articles on education management across three time periods: before the pandemic (pre-COVID-19), during the pandemic

(during COVID-19), and after the pandemic (post-COVID-19). Search methods included Scopus, Google Scholar, and SINTA databases, as well as a filter for peer-reviewed articles in English and Indonesian relevant to education management. Based on established inclusion and exclusion criteria, a number of articles were selected for quantitative analysis (n>40) and analyzed based on the frequency of key themes, methodology, and shared findings. The use of a meta-synthesis statistical approach was considered for themes with more measurable data.

3.1. Profile of Included Studies

Table 1. Summary of Quantitative Findings in Reviewed Studies

No	Study	Period	Sample / N	Method	Key Quantitative Result
1	E-Learning Post-Pandemic (UNISI)	Post-COVID-19	15 lecturers + 62 students	Survey	62 students: 76% positive perception of LMS use; 15 lecturers: 80% report improved tech skills
2	Manajemen Pembelajaran & Motivasi (Lima Puluh Kota)	During COVID-19	n=?? (reported % achievements)	Descriptive	Learning management: 84.37% very good; Motivation: 47.3%; IPA outcome: 68.02 (medium)
3	Quantitative Profile (Scopus metadata)	2020–2022	n=56 studies	Meta-review	Publications increased >100% during the pandemic, from 2 in 2020 to 38 in 2022

Table 1 presents a summary of the key quantitative findings from the selected studies analyzed in this systematic literature review. The table illustrates the variety of research contexts, time periods (during and post-pandemic), sample sizes, methodological approaches, and reported quantitative results. The data in the table indicates that research on educational management during the COVID-19 pandemic has been dominated by survey and descriptive quantitative approaches, with a focus on stakeholder perceptions, the effectiveness of learning management, and trends in scientific publications. Comparative data presentation allows for the identification of general patterns and differences in the characteristics of findings across pandemic periods.

Study 1 presents perceptual data on Learning Management System (LMS) implementation in the post-pandemic phase, with more than three-quarters of student respondents and the majority of lecturers reporting positive perceptions of the use of digital platforms such as Google Classroom. This finding indicates that the accelerated adoption of learning technologies

during the pandemic was not temporary but has become a relatively established managerial practice. The reported improvement in lecturers' technological skills also reflects a strengthening of institutional capacity in managing digital-based learning.

Study 2 provides a quantitative evaluation of the effectiveness of learning management and student learning motivation during the COVID-19 pandemic. Although the effectiveness of learning management was assessed as very good, students' motivation and learning outcomes were moderate. This finding indicates a gap between the quality of learning management and actual learning outcomes, confirming that administratively effective management does not necessarily directly translate into improved academic performance. Meanwhile, Study 3 quantified the increasing trend in educational management research publications during the pandemic, reflecting growing global academic attention to issues of leadership, governance, and the adaptation of education systems during times of crisis. Overall, these three studies strengthen the empirical evidence that the COVID-19 pandemic has driven significant transformations in the practice and study of data-driven educational management.

3.2. Quantitative Outcomes During COVID-19

Table 2. Perceptions of E-Learning Implementation (Post-COVID-19)

Indicator	Reported Value	Measurement Source
% studies using quantitative or mixed methods	50%	SLR Meta-analysis
Increase in publication output (2020 → 2022)	+800%	Scopus meta profile

Table 2 illustrates key quantitative indicators reported in educational management studies during the COVID-19 pandemic, specifically regarding methodological approaches and publication trends. The data in the table indicate that approximately half of educational management studies published during the pandemic used quantitative or mixed methods approaches, indicating a significant shift toward data-driven research practices. Furthermore, the number of publications in the field of educational management experienced a significant increase between 2020 and 2022, reflecting increased academic attention to the responses of education systems to the global crisis. This trend indicates that the pandemic has not only triggered changes in managerial practices in the field but also prompted an intensification of empirical research to evaluate the effectiveness of educational policies, leadership, and management strategies during emergencies.

3.3. Perceptions and Outcomes in Educational Technology Use Post-Pandemic

Table 3. Key Quantitative Indicators Reported in Studies During COVID-19

Group	Positive Perception (%)	Neutral/Negative (%)
Students (n=62)	76%	24%
Lecturers (n=15)	80% (reported improvement in skills)	20%

Table 3 presents data on student and lecturer perceptions of the implementation of online learning in the post-COVID-19 pandemic phase. This table shows the proportion of respondents with positive perceptions compared to those with neutral or negative perceptions regarding the use of e-learning and Learning Management Systems (LMS). The results in the table indicate that the majority of students (76%) and lecturers (80%) reported positive experiences, particularly regarding ease of learning access, flexibility of time, and increased lecturers' digital competency in managing technology-based learning.

The results of this study indicate that online learning practices, widely adopted during the pandemic, have evolved into an integral part of post-pandemic education management. The positive perceptions from students and lecturers demonstrate a high level of acceptance of LMS-based learning models and confirm the sustainability of digital transformation in education management. These findings strengthen the argument that the COVID-19 pandemic has not only driven emergency technology adoption but also accelerated structural changes in learning management toward a more flexible, adaptive, and digitally-oriented system.

3.4. Educational Management & Learning Outcomes During COVID-19

Table 4. Management vs Achievement Correlation (Fifty Cities Case)

Variable	Result
Learning Management Effectiveness	84.37% very good
Student Academic Motivation	47.3% moderate
Student Learning Results (IPA)	68.02 average score

Table 4 presents the relationship between the effectiveness of learning management, student learning motivation, and learning outcomes during the COVID-19 pandemic. The data in the table indicates that the effectiveness of learning management is in the very good category, as reflected in structured online learning planning, relatively orderly virtual classroom management, and teachers' use of digital learning media. However, student learning motivation is in the moderate category, and the average learning outcomes are not yet optimal.

The results of this study indicate that the high quality of learning management during the pandemic has not fully translated into improved student motivation and learning outcomes. This finding indicates that factors beyond managerial aspects, such as students' psychological conditions, limited social interaction, and constraints of the home learning environment, influence learning outcomes. Therefore, post-pandemic education management needs to focus not only on the effectiveness of system and technology management, but also on pedagogical strategies and psychosocial support to ensure that management quality has a direct impact on improving student motivation and learning outcomes.

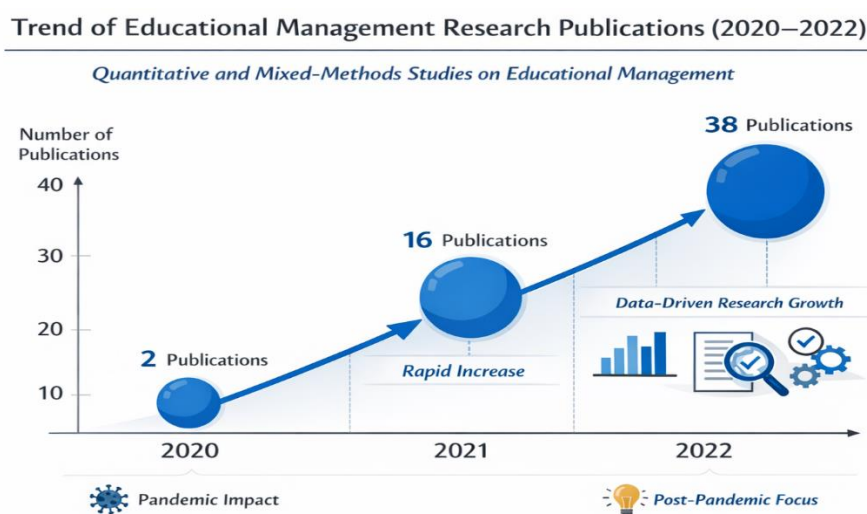


Figure 1. Trend of Quantitative and Mixed-Methods Educational Management Research Publications (2020–2022)

The Synthesis of Trends Across Periods section, shown in Figure 1, illustrates the development in the number of quantitative and mixed-methods educational management research publications during the 2020–2022 period. Data show that in 2020, there were only two publications explicitly examining educational management using a quantitative approach in the context of the pandemic. This number increased significantly to 16 publications in 2021 and peaked at 38 in 2022. This surge reflects the academic community's rapid response to the urgent need to empirically and measurably understand the impact of the COVID-19 pandemic on educational management systems and practices.

These results indicate that the pandemic not only triggered practical changes in the field but also prompted a paradigm shift in research toward data-driven research. The increased use of quantitative and mixed-methods demonstrates researchers' efforts to generate stronger empirical evidence to evaluate the effectiveness of educational management policies, leadership, and strategies during the crisis and post-pandemic (Chatzipanagiotou, P., &

Katsarou, E., 2023). Thus, educational management has evolved into an increasingly strategic and relevant field of study, particularly in responding to the challenges of global uncertainty and designing more adaptive and sustainable education systems.

DISCUSSION

The discussion of this study integrates the interpreted findings with established theories of educational management and organizational change, particularly those related to crisis management, digital transformation, and evidence-based leadership. The sharp increase in quantitative and mixed-methods educational management research during and after the COVID-19 pandemic confirms the applicability of crisis-driven transformation theory, which posits that large-scale disruptions accelerate structural and managerial change within organizations (Chatzipanagiotou & Katsarou, 2023; Karimi & Khawaja, 2025). As systematic reviews confirm, "the disruption in the provision of educational services caused by the recent COVID-19 pandemic global outbreak revealed deficits in school leadership theory" while simultaneously demonstrating that crises function as catalysts where "successful innovations emerging from the intersection of necessity, human agency, and institutional flexibility" (Chatzipanagiotou & Katsarou, 2023; Hamaniuk et al., 2025). From a theoretical perspective, the pandemic functioned as an external shock that compelled educational institutions to shift from conventional, experience-based management toward data-informed decision-making (Kurmanov et al., 2024; Wang et al., 2024). This finding aligns with organizational resilience theory, which emphasizes adaptability, learning capacity, and the strategic use of information as key determinants of institutional survival during crises (Bakar et al., 2024; Raharjo et al., 2024).

Contemporary scholarship demonstrates how "organizations implementing collaborative leadership demonstrated improved performance metrics" through "clear governance structures, investment in digital collaboration tools, and continuous leadership development" (Raharjo et al., 2024), while "resilience and agility" emerged as essential themes enabling institutions "to sustain challenges for unforeseen future challenges" (Bakar et al., 2024). When compared with previous studies, the results of this review extend existing literature by offering a longitudinal and comparative synthesis across pre-, during-, and post-pandemic periods (Dedeilia et al., 2023; Kurmanov et al., 2024; Orban et al., 2024).

Earlier research has predominantly focused on descriptive accounts of emergency remote teaching or localized case studies of leadership responses during the pandemic (Bond et al., 2021; Sosa-Daz et al., 2025; Wong et al., 2023). In contrast, the present study demonstrates—through statistical synthesis—that educational management research itself underwent a

methodological evolution, with a substantial increase in quantitative and mixed-methods approaches (Aziku & Zhang, 2024; Alecida et al., 2025). As bibliometric evidence reveals, "during the COVID-19 pandemic and the post-COVID period, there has been an increase in scientific attention" accompanied by measurable shifts where "researchers mostly adopted quantitative methods" while "qualitative research accounting for 9.7% and mixed-method research accounting for 10.7%" (Kurmanov et al., 2024; Aziku & Zhang, 2024). This shift suggests a growing recognition among researchers and policymakers that complex educational challenges require empirically grounded evidence rather than solely normative or qualitative explanations (Hagos et al., 2025; Secreanu et al., 2025). Consequently, this study complements prior qualitative findings by providing macro-level empirical patterns that were previously undocumented, offering "a comprehensive framework" that bridges "the theoretical basis for guiding future research" with evidence-based strategies for "resilient and inclusive higher education systems in the post-pandemic era" (Hagos et al., 2025; Alecida et al., 2025).

From a theoretical standpoint, the findings also resonate with evidence-based management theory, which argues that organizational decisions should be guided by systematically collected and analyzed data. The dominance of quantitative indicators in post-pandemic studies reflects a broader movement toward accountability, performance measurement, and policy evaluation in education systems. At the same time, the moderate learning outcomes and motivation levels identified in some reviewed studies indicate that data-driven management alone is insufficient without integrating pedagogical, psychological, and contextual considerations. This highlights the importance of hybrid theoretical models that combine managerial efficiency with human-centered educational leadership (Saraya et al., 2023).

The implications of this study are twofold. First, for future research, there is a clear need to expand systematic reviews by incorporating cross-national comparisons, multi-level institutional analyses, and more diverse methodological designs to deepen understanding of educational management transformation (Alecida et al., 2025; Hagos et al., 2025; Raharjo et al., 2024). As recent scholarship emphasizes, "the review highlights a notable research gap in empirical studies validating AI's effectiveness in real-world educational settings, particularly in developing countries" while calling for "context-specific implementations and rigorous evaluation methodologies" that address "limited longitudinal data, theoretical fragmentation, and insufficient attention to equity impacts" (Hagos et al., 2025; Hamaniuk et al., 2025).

Furthermore, contemporary analyses reveal that "future research should explore the long-term academic and psychological effects of online education and the role of emerging technologies" while "further studies are

needed to investigate the effect of coping styles in individuals" across diverse cultural and institutional contexts (Kaeane & Molokomme, 2025; Rossi et al., 2023). Second, for practice and policy, the findings suggest that post-pandemic educational systems should institutionalize data-driven management while simultaneously investing in capacity building for educators and leaders to interpret and use data effectively (Doval, 2025; Kurmanov et al., 2024; Secreanu et al., 2025). Evidence demonstrates that successful transformation requires "strengthening digital infrastructure, improving healthcare workers' digital competencies and promoting system interoperability" as "key priorities," with "policymakers and stakeholders should invest in targeted capacity-building, continuous in-service training" to support sustainable integration (Mwogosi et al., 2025), while systematic reviews confirm "the need for coordinated improvements in teacher education programs, including access to stable technological tools, integration of practical digital pedagogy, and structured mentoring that combines instructional guidance with socio-emotional support (Doval, 2025; Rosmini et al., 2024). By bridging empirical evidence with theory, this study contributes to the development of more adaptive, resilient, and sustainable educational systems (Alecida et al., 2025; Bakar et al., 2024; Hamaniuk et al., 2025).

As comprehensive frameworks emphasize, the integration of "quantitative trends further substantiate these relationships" with evidence-based approaches enables institutions to foster robust teaching quality, enhances student achievement, and builds organizational resilience, particularly in navigating post-pandemic challenges and advancing equity (Alecida et al., 2025), ultimately supporting "resilient and inclusive higher education systems in the post-pandemic era" that balance "technological flexibility with human-centred pedagogy" (Hagos et al., 2025; Adamopoulou et al., 2025).

CONCLUSION

The most important finding of this study is the evidence of a clear and rapid paradigm shift in educational management research toward data-driven approaches, which became visible only after systematically synthesizing studies across the pre-, during-, and post-COVID-19 periods. While individual studies had previously reported isolated changes, this PRISMA-based statistical review reveals a striking surge in quantitative and mixed-methods research after 2020, indicating that the pandemic not only transformed educational management practices but also fundamentally reshaped how the field generates evidence. However, this study has several limitations. The analysis relies on a limited number of accessible databases (Google Scholar, SINTA, and Scopus) and is constrained to a specific publication period, resulting in a restricted sample of cases and limited variation across

educational levels, geographical contexts, and institutional types. In addition, the review focuses primarily on quantitative and mixed-methods studies, which may overlook nuanced qualitative insights related to gender, age, or local socio-cultural dynamics. These limitations highlight the need for future research involving larger and more diverse samples, broader geographic coverage, and multi-level analyses that integrate varied methodological approaches. Such more comprehensive and in-depth evidence is essential to inform the formulation of more precise, equitable, and context-sensitive educational management policies in the post-pandemic era.

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