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Mapping the Transformation of Educational Management through Artificial Intelligence: A PRISMA-Based Systematic Review

Fettouma Slaitan

Mohamed V University, Rabat

fettouma.slaitan@yahoo.com

Abstract. Despite the exponential interest of researchers and policymakers over the past two decades in integrating AI into education, there is a clear lack of comprehensive studies on AI in the context of educational management and governance, given that most research in this area is focused on educational leadership. To this end, this article presents a systematic review of the literature conducted according to the PRISMA protocol in order to explore the state of the art of research on the role of AI as a lever for transforming education management for the period 2000-2025. It draws on an academic corpus of research and studies indexed in the Scopus and Web of Science databases. The present work sheds light on key dimensions IA is redefining, namely governance, strategic and operational management. The results reveal that AI acts as a decision-making tool, a means of optimizing administrative processes, and a strategic management instrument, while raising major challenges related to algorithmic governance, equity, and institutional accountability. Five major transformative dimensions of educational management are highlighted in this study: redefining educational performance, streamlining internal processes, skills management and organizational learning, data and systems governance, and decision-making driven by predictive analytics.

Keywords. artificial intelligence, educational management, governance, higher education, systematic review, PRISMA

1. Introduction

Artificial intelligence (AI) is revolutionizing management practices in educational organizations, redefining planning, steering, and governance practices, and now extending beyond the educational sphere to encompass educational management, understood as the strategic, administrative, and organizational management of institutions (Ball, 2012; Fullan 2016).

While educational leadership focuses on human and transformational dynamics (Goldfarb & Lindsay, 2022; Walczak, 2016), educational management on the other hand examines the performance, governance, and accountability of institutions in a context of increasing automation (Ball, 2003). It is an interdisciplinary field, situated at the crossroads of public management, organizational sociology, and educational sciences, which aims to optimize collective functioning, support the educational mission, and promote institutional innovation.

The study of the incorporation of artificial intelligence in the field of education focuses mainly on educational leadership, centered on the human and ethical aspects of change, while neglecting educational management, whose aspects related to governance, performance, and accountability remain largely unexplored. This approach reflects a perspective of AI as a driver of leadership change rather than as an instrument of institutional management.

Therefore, this systematic review aims to rigorously and cumulatively analyze how scientific research over the past two decades has conceptualized, modeled, and evaluated educational management as an integrated strategic, administrative, and organizational process in contexts marked by digitization, performance-based governance, and institutional autonomy reforms.

II- Conceptual Framework

1. Educational management vs educational leadership

According to Bush (2021), educational management is defined as the set of methods, processes, and practices for planning, coordinating, and evaluating resources to support the educational mission. It constitutes a strategic niche at the intersection of public management, university governance, and organizational performance. Educational management is based on a structural and procedural approach, aiming for efficiency, governance, and institutional performance (Leithwood & Jantzi, 2008; Bush, 2011). Educational leadership, on the other hand, is based on a logic of influence with a view to creating dynamics of engagement and innovation. Since the integration of AI into the field of education in the 2000s, higher education in particular has undergone a profound transformation. In this context, AI is no longer considered a technological tool for learning or automation, but is evolving towards a cognitive role in the management chain (Zawacki-Richter et al., 2019) by supporting the functions of strategic planning, predictive analysis, talent management, financial management, and performance control.

A detailed analysis of management literature in this area highlights three major and complementary themes

1. The governance dimension: AI promotes greater transparency by offering better traceability of decisions, while requiring a redefinition of managerial responsibility (Batool et al., 2024).

2. The performance dimension: AI enables the optimal allocation of human, financial, and informational resources while supporting KPI-based management (Lambovska & Raitskaya, 2025).

3. The institutional ethics dimension: the decision-making process is assisted, or even delegated to algorithms, which requires the implementation of audit and control mechanisms (AERA Open, 2024; , 2024).

Consequently, artificial intelligence does not merely facilitate management: it transforms its intrinsic nature by creating a space for mediation between humans, data, and machines through educational management.

1.1 Educational management through Artificial intelligence: From digitization to algorithmic governance

Pioneer research on the digitization of higher education emerged in the 2000s, proposing new models of governance based on the use of data (data-driven management). The use of integrated systems, analytical dashboards, and automated planning tools has improved optional management practices. Höckel et al. (2018) show that digitization is profoundly

transforming administrative functions by streamlining planning and communication processes. Furthermore, Alhouthi (2020) designs a model of digital educational management based on data management, strategic planning, and participatory governance, while admitting the limited scope of its contextual application. Lassoued and Al-Sharhan (2021) highlight the challenges of training and equitable access to digital resources, but without delving into the managerial dimension of this transformation. More recently, Nguyen (2023) and Martínez & Ortega (2024) converge on the idea that contemporary educational governance rests on three inseparable pillars, namely: the strategic dimension (vision and steering), the organizational dimension (coordination and structure), and the administrative dimension (regulation and efficiency). AI gives new impetus to educational management, which is transitioning to algorithmic governance, characterized by the ability to produce, examine, and exploit data to guide decisions (Ghaffar, 2025). The incorporation of artificial intelligence in the academic sector is leading to better coordination, more effective communication, and greater accountability for decision-makers. (Wu, Zhang, and Carroll (2024), thus translating algorithmic results into institutional decisions. In this context, AI serves as a link between these two aspects: it provides tools for management while transmitting information to leadership. Therefore, discussing educational management in the age of AI involves examining the ability of institutions to combine algorithmic management and human governance, develop ethical data policies, and implement digital equity systems. On the other hand, educational leadership is based on an influence approach to generate engagement and innovation dynamics.

III- Research Design:

In order to address our research problematic and rigorously identify sources for bibliometric analysis, this literature review was conducted in accordance with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) protocol. (Moher et al., 2009). These databases cover the fields of education, management, educational technology, and public governance, ensuring an interdisciplinary approach to the corpus. The objective was to identify, study, and summarize scientific research on the role of artificial intelligence in educational management between 2000 and 2025, with the aim of providing a unified perspective on the current state of research. To this end, the first step was to collect data from the Scopus and Web of Science (WoS) databases, which contain leading research. A selection of peer-reviewed articles was made for inclusion for quality purposes. (Hallinger & Kovačević, 2019)

Documentary research has been conducted through the main and principle international academic databases. La recherche documentaire a été effectuée sur les principales bases académiques internationales, namely **Scopus** (Elsevier), **Web of Science (WoS)**, **SpringerLink**, **ScienceDirect**, **Wiley Online Library**, **SAGE Journals**, **MDPI**, **ACM Digital Library**, **ERIC**. **For a more comprehensive analysis, institutional reports with scientific community have been integrated - OCDE, UN) for they offer an intersection view of education, public governance.**

3.1. Search strings and selection criteria

The search strategy used structured Boolean combinations:

("Artificial Intelligence" OR "AI") AND ("Educational Management" OR "Institutional Governance" OR "Educational Administration" OR "Higher Education Management")

AND ("Decision-making" OR "Performance" OR "Governance" OR "Efficiency")

The inclusion criteria selected relate to peer-reviewed criteria published between 2000 and 2025, Scopus/WoS indexed studies, and publications focusing on management, governance, or institutional steering, rather than solely on pedagogy.

The exclusion criteria relate to research focusing exclusively on pedagogical applications (teaching, learning, assessment), technically oriented studies with no explicit link to governance or management, and non-academic or non-peer-reviewed documents.

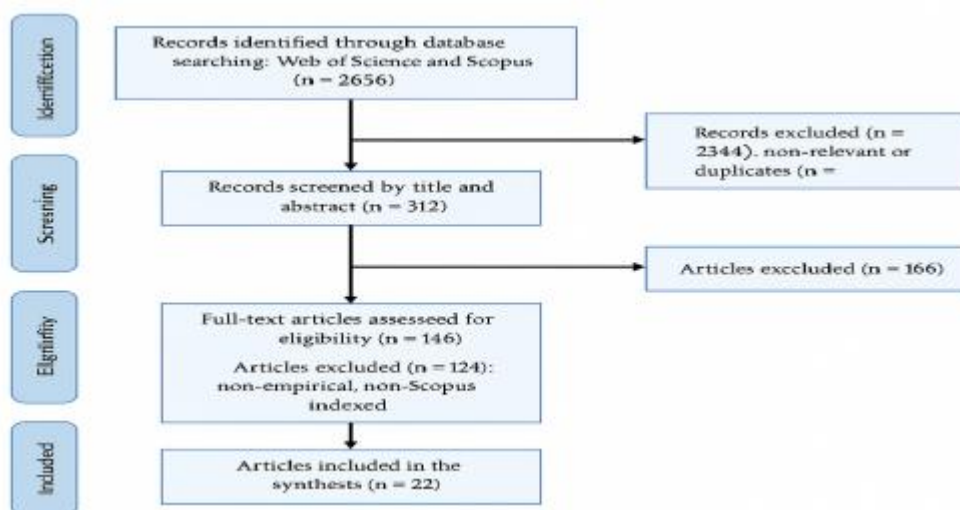
The selection process followed four successive stages. First, 2,473 articles were identified from the selected databases. A deduplication process was then carried out, removing 214 duplicates. A screening phase of 80 articles from 480 articles was retained after reading the titles and abstracts.

Eligibility and final inclusion: 22 articles were selected after full reading, thematic validation, and methodological compliance.

3.2 Methodological quality and data extraction

After collecting the references, we filled in all data related to the references (title, author, year, publisher, ISSN, DOI, abstract, keywords, ...) in the ZOTERO electronic library. We then exported our entire Zotero library to NVIVO 10 software for analysis. The first level of analysis performed by NVIVO 10 is an exploratory analysis based on the abstracts of the publications. We performed a word frequency query. This analysis allowed us to detect the abstracts that contain the most keywords of our search in order to ensure the methodological quality of the data extraction, each article included was analyzed using an evaluation grid inspired by Petticrew & Roberts (2006), comprising the following criteria: clarity of the issue, methodological rigor, internal and external validity, and relevance to educational management, excluding educational leadership. The information was then extracted according to six variables: APA reference, issue studied, methodology adopted, and contributions to educational management. These variables were used to construct the summary table of the studies analyzed and to identify the major trends in the field.

Figure 1: PRISMA flowchart for the data selection process



Source: author's own research

IV Findings and discussion

The in-depth analysis of the corpus drawn from the 22 selected studies (2000–2025) reveals five main areas of focus that demonstrate how artificial intelligence (AI) is changing educational management in higher education. These areas are based on information drawn from

studies such as Zawacki-Richter et al. (2019), Bond et al. (2024), Ghaffar (2025), Wu et al. (2024), Lambovska & Raitskaya (2025), Xu & Ouyang (2024), as well as several meta-analyses published by Springer and Elsevier.

The in-depth analysis of the selected references has enabled us to establish a synthesis table that brings the main data related to the research: the short reference, venue, problematic, methodology, and key insights for educational management. The table below will help to visualize, organize, and study the results, which would be extremely laborious to describe throughout the document (Berland et al., 2013).

Table 1 Synthetic table of analyzed literature

Reference (short APA)	venue	Field	Problematic	Method	Key Insights for Educational Management
Zawacki-Richter et al. (2019)	IJETHE / SpringerOpen (Scopus/WoS)	Global HE (2007–2018)	Map AI in HE and areas of application.	SLR (146 studies)	Identifies 'institutional & administrative services' as a usage pillar; shows underinvestment in management research.
Bond et al. (2024)	ETHE (Scopus/WoS)	Global HE (reviews)	Review of reviews on AIED (tertiary level).	Meta-review (systematic reviews)	Concludes a governance/ethics gap and managerial frameworks for rigorous institutional deployment.
Badiee et al. (2024)	Socio-Economic Planning Sciences / Elsevier (Scopus/WoS)	Global HE	How OR/MS linked to AI improves HE performance and efficiency.	SLR (203 papers)	Classifies uses: timetabling, resource allocation, admissions, planning; strong operational value for management and finance offices.
Wu, Zhang & Carroll (2024)	Information (MDPI) (Scopus/WoS)	14 US universities	What AI governance models exist in guidelines?	Case study (document analysis)	Highlights multi-unit governance and dedicated roles, key for institutional AI steering.
AERA Open (2024)	AERA Open / SAGE (Scopus/WoS)	US HE	Are institutional prediction algorithms biased?	Quantitative bias analysis	Reveals bias against minority students; recommends audits, equity metrics, and managerial safeguards.
Liz-Domínguez et al. (2019)	Applied Sciences (MDPI) (Scopus/WoS)	Global HE	State of the art on Early-Warning Systems / prediction.	SLR (PRISMA)	Shows institutional integration of EWS and highlights data quality and inter-service governance importance.
Zeineddine et al. (2021)	Computers & Education: AI / Elsevier (Scopus/WoS)	Operational HE	Improving academic prediction using AutoML.	Quantitative (AutoML)	Highlights predictive targeting benefits but stresses need for data governance frameworks.
Ghaffar (2025)	Review of Education / Wiley (Scopus/WoS)	HE	Optimize exam timetabling via hybrid AI.	SLR	Reduces conflicts and improves administrative efficiency; calls for actor coordination.
Turabieh et al. (2011)	Computers & Operations Research / Elsevier	HE	Meta-heuristics for timetabling.	Experimental	Provides a durable concept: AI + OR for planning, transferable to academic services.

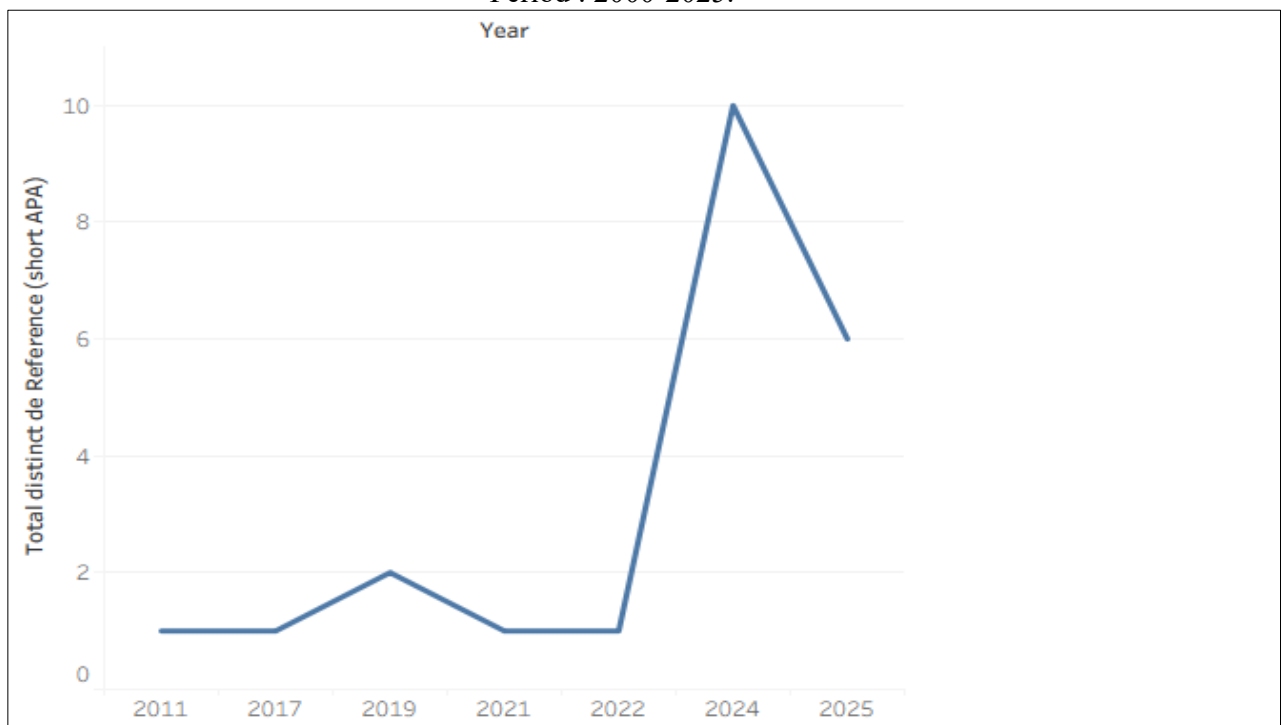
	(Scopus/WoS)				
Wong (2017)	AAOUJ / Emerald (Scopus)	HE	How is Learning Analytics used in decision-making?	Review + case	Identifies data sources, decision domains, and governance structures needed.
Pyle et al. (2025)	PACMHCI / ACM (Scopus/WoS)	US Admissions	Effects and perceptions of algorithmic admission systems.	Mixed method (content analysis + interviews)	emphasizes equity risks and the importance of transparency and governance in admissions.ljkh
Nartgün (2025)	Atlantis Press (indexed proceedings)	HE	Role of LA in institutional decision-making.	Review + examples	Highlights governance, confidentiality, and inter-unit collaboration for managerial decision-making.
An, Yu & James (2025)	IJETHE / SpringerOpen (Scopus/WoS)	Top-50 US HEIs	Mapping AI policies (teaching, research, administration).	Mixed (topic modeling + qualitative analysis)	Reveals the gap between pedagogical and administrative AI policies; recommends integrated AI strategies.
Batool, Zowghi & Bano (2024)	AI & Ethics / Springer (Scopus/WoS)	Multi-sector (incl. HE)	State of the art of AI governance.	SLR	Proposes accountability and transparency principles transferable to universities.
Mukred et al. (2024)	Heliyon / Elsevier (Scopus/WoS)	Multi-country HE	Adoption of LA tools for informed decision-making.	Quantitative	Emphasizes training and infrastructure as levers for effective management steering.
Xu & Ouyang (2024)	ETR&D / Springer (Scopus/WoS)	HE (2016–2022)	Typologies of AI uses and beneficiaries.	SLR (138 studies)	Notes research gaps on managers and need for an integrated approach.
(2024)	(report)	Education systems	Synthesis of algorithmic bias risks in education.	Policy brief	Recommends audits, equity metrics, and transparency for responsible algorithmic management.
An, Y., Yu, J.H., James, S. (2025)	International Journal of Educational Technology in Higher Education. (SpringerOpen)	United States (top 50 HEIs)	What institutional response to GenAI tools in administrative and academic activities?	Mixed method (topic modeling, sentiment analysis, qualitative)	Reveals that most HEIs have AI policies for teaching but fewer for administrative functions; stresses integration of managerial processes into AI strategy.
Lambovska, M., Raitskaya, A. (2025)	MDPI	Global / HEI	What are the current challenges of management control systems in HEIs in the digital/AI era?	SLR (15 sources 2020–2025)	Highlights 'technological integration', 'training', and 'managerial engagement' as core challenges for institutional AI deployment.
Ghimire, A., Edwards, J. (2024)	arXiv preprint (arXiv)	Global (secondary schools + HEI)	What is the extent of AI policies in education	Survey + documentary analysis	Identifies a major policy gap in administrative/management functions; suggests proactive policy structuring by management.

			(including administration)?		
Dudycz, H., Hernes, M., Kes, Z., Mercier-Laurent, E., Nita, B. (2022)	IFIP Advances in Information and Communication Technology / arXiv preprint (arXiv)	Poland / European universities	How to design an 'intelligent' management control system for HEI integrating AI?	Modeling conceptual framework +	Emphasizes integration of AI modules (cognitive agents, ML) into university management control (indicators, dashboards). Useful for strategic and operational AI steering.
Wu, C., Zhang, H., Carroll, J.M. (2024)	Information (MDPI) / arXiv (MDPI)	United States (14 universities)	What AI governance strategies are adopted by HEIs?	Multiple case studies (guidelines, document analysis)	Shows the critical importance of multi-unit governance (IT, teaching, administration) to steer AI institutionally.

Source: author’s own research

In terms of the evolution of the timeline of publication of the documents collected, Figure 2 illustrates an increasing trend of publication from the year 2000 onwards, which shows us that educational management through artificial intelligence is a topical research subject, which benefits from the great interest and importance from the scientific research community. An exponential burst in publications collected since 2022 is explained by the fact by emergence and integration of new AI based technologies in education. This effect is enhanced considering the covid pandemic factor which led to a massive adoption of AI -driven systems.

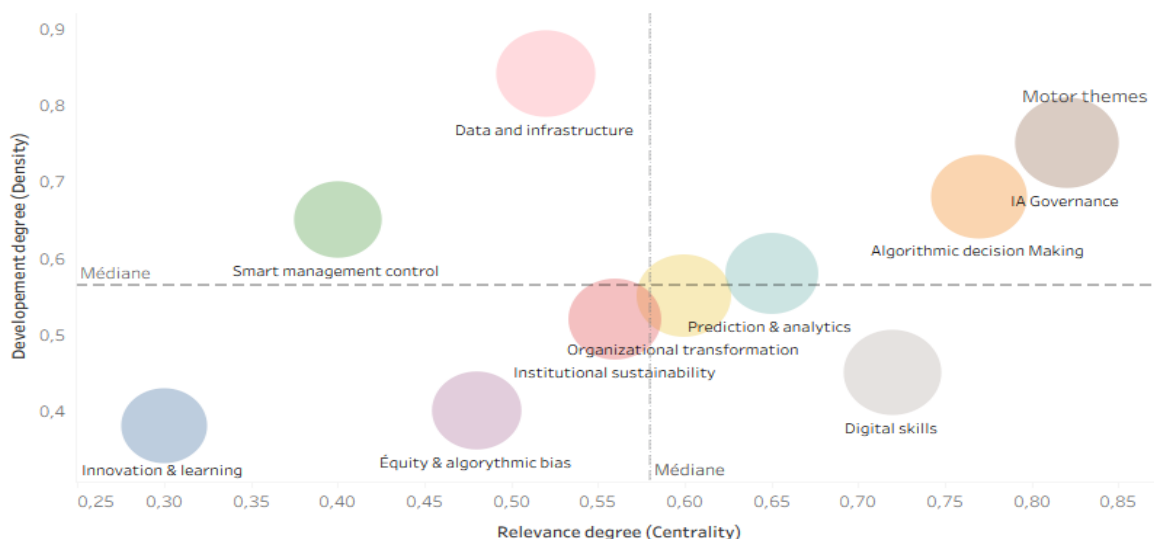
Figure 2: Historical evolution of publications on Educational Management through AI. Period : 2000-2025.



Source: author’s own research

As depicted in Figure 2, the key themes fall into four different quadrants in a two-dimensional graph, namely the x-axis (representing density) and y-axis (representing centrality). Basic themes (placed in the lower-right quadrant, see Figure 2) indicate that they are significant for the research on AI and educational management, but less developed. They cover: digital skills and organizational change management. Motor themes (placed in the upper-right quadrant, see Figure 2) present well-developed and significantly structured research topics on AI and educational management. They include AI governance, algorithmic decision-making, and prediction and analysis, decision-making. Emerging or disappearing themes (placed in the lower-left quadrant, see Figure 2) indicate that they are at the infancy stage of development with marginal importance, majorly demonstrating either promising or disappearing themes. They include equity and algorithmic bias, innovation and learning. Finally, niche themes (placed in the upper-left quadrant, see Figure 8) indicate strongly developed internal ties (high density) with unimportant external links and so are of only limited importance (low centrality) for the research field on AI in educational leadership. They include smart management control and data and infrastructure.

Figure 3 : Thematic map analysis of research on AI in educational management.



Source: author's own research

4.1 Thematic Analysis

A preliminary analysis of this body of research is sufficient to identify a theme that is directly addressed in all of the articles: the nebulous nature of artificial intelligence (AI) as a concept (Pharm and Sampson, 2022). Furthermore, an in-depth analysis of current topics related to research on the impact of AI in the transformation of educational management has identified the research themes studied, as indicated below.

4.1.1 Algorithmic governance and institutional responsibility

A first significant trend is the growing importance of algorithmic governance, i.e., the incorporation of artificial intelligence into decision-making and internal regulation mechanisms. Studies by Batool, Zowghi, and Bano (2024, AI & Ethics) and Wu et al. (2024, Information, MDPI) show that institutions that implement explicit AI governance policies—encompassing auditing, transparency, and responsibility allocation—are better able to reconcile technological innovation and institutional legitimacy.

On the other hand, AERA Open (2024) and (2024) highlight the dangers of algorithmic bias and the lack of accountability structures, which can undermine trust between students, faculty, and administrators. As a result, AI governance is becoming a crucial tool for responsible educational management, requiring data ethics and a culture of human oversight.

4.1.2 Strategic management and decision-making analytics

Artificial intelligence is increasingly being used to support strategic planning, forecasting, and institutional management. Research by Liz-Domínguez et al. (2019, Applied Sciences) and Zeineddine et al. (2021, Informatique & Éducation: IA) demonstrate the improvement brought about by predictive models in detecting dropout risks, human resource planning, and student flow management. These systems facilitate proactive management through intelligent dashboards, thereby consolidating data-driven management approaches. However, Bond et al. (2024) and Xu & Ouyang (2024) point out that less than 15% of research directly involves managers as users of these systems, highlighting a gap in managerial education for reading and analyzing data.

4.1.3. Operational efficiency and process optimization

Numerous studies (such as those by Ghaffar, 2025; Turabieh et al., 2011) attest to AI's ability to optimize administrative procedures such as exam scheduling, resource allocation, and timetable management. According to Badiee et al. (2024), in the journal *Socio-Economic Planning Sciences*, methods derived from operations research (OR/MS) are strongly connected to AI technologies, leading to tangible improvements in efficiency and financial savings for universities. This research illustrates that AI adds value to educational management, particularly in terms of micro-management: reducing scheduling conflicts, allocating rooms more efficiently, and optimizing workloads.

4.1.4 Skills governance and organizational learning

Artificial intelligence is also driving transformation in educational human resource management. Studies by Mukred et al. (2024, *Heliyon*) and Jackman (2025, *Caribbean Educational Research Journal*) show that data analysis tools make it easier to identify staff training needs and adjust professional development plans. This is in line with the concept of a “learning organization”: institutions that use AI tools for skills management increase their potential for internal innovation. However, the success of these initiatives depends first and foremost on establishing an environment of trust and a minimum level of algorithmic competence among managers and teachers.

4.1.5 Ethics, equity, and inclusive governance

Finally, ethical considerations are present throughout the corpus. Recent studies, such as those by Van Busum et al. (2025, *Informatics, MDPI*) and Selvaratnam & Venaruzzo (2024, *JEHE*), highlight the importance of human-centered governance that ensures transparency, fairness, and recourse. The image of algorithmic justice has a direct impact on organizational trust and institutional reputation (Van Busum et al., 2025). These findings highlight that the digitization of educational management can only be sustainable if it is based on sound ethical principles and the active involvement of institutional stakeholders in the creation and oversight of AI systems.

A combined review of the twenty studies highlights three important contributions. Firstly, Artificial intelligence improves the strategic and operational skills of university departments; It establishes new management models based on data analysis, but requires ethical governance systems. this requires mixed management training, where technical expertise is

linked to institutional responsibility. This body of work therefore facilitates the conceptualization of AI-enhanced educational management as a socio-technical ecosystem integrating performance, sustainability, and equity. Research agrees that AI is revolutionizing educational management by integrating new decision-making systems based on data and forecasting. However, this evolution varies depending on the context: Anglo-Saxon universities have more developed governance structures than those in developing countries. Therefore, The main challenge is to strike a balance between efficiency and equity: algorithmic optimization tends to favor operational performance at the expense of organizational justice.

4.2 Mnagerial implications :

First, the development of institutional skills in data governance and understanding algorithms appears to be a prerequisite for informed management of artificial intelligence (Brynjolfsson & McAfee, 2017; , 2024). This requires the creation of decision-making architectures that integrate transparency, traceability, and algorithmic accountability, in line with UNESCO's (2022) recommendations on AI ethics. Second, it is essential to establish governance structures dedicated to AI—ethics committees, transparency audits, and usage charters—to ensure alignment between technological innovation and educational values (Batool et al., 20b24; Xu & Ouyang, 2024). These measures must be accompanied by in-depth training for managers and executives in algorithmic management, data-driven strategic planning, and ethical oversight of digital tools (Bond et al., 2024; Wu et al., 2024). Finally, sustainable digital transformation requires interdisciplinary cooperation between engineers, educators, administrators, and lawyers, promoting the co-construction of inclusive and responsible AI ecosystems (UNESCO, 2022; , 2024). These guidelines are in line with the vision of AI serving educational justice, institutional performance, and organizational sustainability, as advocated by international educational governance frameworks (, 2024; European Commission, 2023).

V- Limits and further research perspectives

Despite the methodological robustness of this review, certain limitations must be acknowledged. The geographical concentration of publications, mainly from North American and European contexts, reveals a significant epistemic bias, reflecting the poor representation of artificial intelligence dynamics in educational spaces in the Global South (Eke et al., 2023; An et al., 2025) Similarly, the literature suffers from a scarcity of empirical studies focused on university management practices, favoring more descriptive or pedagogical approaches. Methodologically, the insufficient use of qualitative approaches and socio-organizational analyses limits our understanding of the human, cultural, and political dimensions of change (Fullan et al., 2024; Karakose et al., 2023).

These observations open up promising avenues: extending research to African, Latin American, and Asian contexts to improve the comparability of results (Bond et al., 2024); furthering the study of the organizational and psychological impacts of human-AI collaboration in educational decision-making (Hutchins, 1995; Dudycz et al., 2022); and developing AI-based managerial performance indicators that integrate equity, efficiency, and innovation (, 2024; Batool et al., 2024).

Conclusion

A systematic analysis of the literature reveals that research on artificial intelligence (AI) in education focuses primarily on educational leadership, to the detriment of educational management itself. Contemporary research—dominated by the frameworks of Digital Leadership (Karakose et al., 2023; Wang, 2021) and Diffusion of Innovation Theory (Rogers, 1962; Aldosari, 2020; Tyson et al., 2021), primarily highlights the transformational capabilities of educational leaders, their role in technology adoption, and the construction of a culture of

innovation. However, this perspective, while essential, neglects the structural, strategic, and decision-making dimensions that underpin educational management as an autonomous field of institutional governance.

Organizational theories, such as the Four Frames Model (Bolman & Deal, 1991; Islam et al., 2022) or Sociotechnical Systems Theory (Trist & Bamforth, 1951; Thompson et al., 2022), offer a more relevant framework for understanding AI as an instrument of systemic governance rather than simply a vehicle for transformational leadership. These approaches emphasize the reconfiguration of decision-making structures, cross-functional coordination, and the redefinition of control and performance mechanisms within institutions (Dudycz et al., 2022; Lambovska & Raitskaya, 2025). Thus, the scientific debate is shifting from an anthropocentric conception of AI—focused on the development of skills and leadership—towards an institutional and systemic approach, questioning the accountability, governance, and organizational sustainability of education systems (, 2024; Batool et al., 2024; Bond et al., 2024). The challenge is no longer just to equip leaders with intelligent tools, but to establish a learning-based educational governance system capable of self-regulation, continuous adaptation, and algorithmic ethics.

Ultimately, the future of educational management in the era of artificial intelligence will depend on the ability of institutions to combine technological innovation, strategic management, and responsible governance (Xu & Ouyang, 2024; Ghaffar, 2025; Wu et al., 2024). This triptych—innovation, ethics, and adaptability—forms the basis of a renewed managerial paradigm geared toward the cognitive and organizational sustainability of higher education systems by 2030.

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