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Impact of Artificial Intelligence (AI) on Educational Leadership: A Systematic Literature Review

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ABSTRACT

This systematic literature review (SLR) examined how artificial intelligence (AI) influences educational leadership practices and what outcomes, risks, and governance challenges are reported in recent empirical research. Guided by the PRISMA-2020 framework, a comprehensive search was conducted across six major academic research databases, namely Web of Science, Scopus, PubMed, ERIC, DOAJ, and EBSCO. Eighteen peer-reviewed empirical studies published between 2024 and 2025 met the inclusion criteria and were synthesised using thematic analysis. Findings show that AI primarily affects instructional and administrative leadership by supporting data-informed decision-making, automating routine managerial tasks, and enabling more structured feedback and professional development. Leaders reported improved efficiency and faster access to organisational data; however, direct evidence of improved student outcomes remains limited. Ethical leadership emerged as a critical dimension of AI adoption, with persistent concerns regarding algorithmic bias, transparency, data privacy, and professional trust. Governance frameworks were found to be uneven, with many institutions lacking formal policies to regulate AI-supported leadership practices. Overall, the review portrays AI as a supportive rather than autonomous actor in leadership work, with its impact shaped by leaders' professional judgement, institutional capacity, and regulatory context. The findings highlight the need for stronger governance mechanisms, leadership preparation in AI literacy and ethics, and longitudinal research across diverse educational settings.

Keywords: *Artificial Intelligence; Educational Leadership; Generative AI; AI Governance; Systematic Literature Review*

INTRODUCTION

Artificial intelligence (AI), particularly generative AI, has rapidly moved from classroom-focused applications to system-level use in educational organisations (Arar et al., 2025). During 2024–2025, AI tools began to influence not only teaching and learning but also leadership functions such as planning, monitoring performance, decision-making, and professional development (Crompton et al., 2024; Renta-Davids et al., 2025). Educational leadership is therefore increasingly shaped by AI-enabled data systems, automation, and algorithmic recommendations.

Earlier research on AI in education mainly focused on teaching and learning applications, such as intelligent tutoring systems and adaptive platforms (Holmes & Tuomi, 2022). More recent studies show a shift toward organisational and leadership uses of AI. Educational leaders report using AI to analyse student data, support teacher feedback, and reduce routine administrative work (Crompton et al., 2024;

Berkovich, 2025). These practices suggest that leaders now work alongside digital systems when making decisions, which changes traditional patterns of leadership and professional judgement (Göçen & Döğer, 2025). At the same time, researchers highlight important ethical and organisational concerns. These include risks of biased algorithms, limited transparency in automated systems, threats to data privacy, and the growth of monitoring practices that may weaken trust among teachers (Birkstedt et al., 2023). Leadership in AI-supported settings therefore involves not only technical use of tools but also responsibility for fairness, accountability, and protection of professional values (Ahmed et al., 2025; Hallinger et al., 2024; Uzorka & Kalabuki, 2025). AI adoption in education is thus closely linked to questions of power, control, and public trust.

Despite the increasing number of studies in this area, research on AI and educational leadership remains scattered across different fields, including education, management, and information systems. Studies refer to different technologies such as learning analytics systems or large language models. Leadership is also often defined narrowly as management efficiency rather than as a broader practice that includes instructional, transformational, and ethical roles (Williamson et al., 2023). The years 2023–2025 mark an important stage in this research area. During this period, GenAI tools became widely available to educators and administrators, and international organisations such as UNESCO issued guidance on responsible AI use in education (Holmes & Miao, 2023; Sahlgren, 2025). Educational leaders were required to make rapid decisions about adoption, regulation, and staff development, often without clear research-based guidance. Without a structured review, leadership practices may be shaped by isolated examples or commercial claims rather than by consolidated evidence.

To address this gap, the present study conducts a systematic literature review using the PRISMA-2020 framework. The review synthesises findings from selected peer-reviewed empirical studies published between 2024 and 2025 and indexed in major academic databases including Web of Science, Scopus, PubMed, ERIC, DOAJ, and EBSCO. The review focuses specifically on educational leadership rather than classroom instruction, with the aim of clarifying how AI affects leadership roles and practices and what challenges accompany its use.

Research Questions

RQ1. How does artificial intelligence influence educational leadership practices and roles in empirical studies published during 2024–2025?

RQ2. What outcomes, risks, and governance challenges related to AI-supported leadership are reported in recent research?

By addressing these questions, this review seeks to provide a clear and balanced summary of current evidence on AI and educational leadership. The findings are intended to support leadership preparation, inform professional development, and guide policy decisions related to responsible and effective AI use in education systems.

LITERATURE REVIEW

Artificial Intelligence (AI) in Educational Leadership

Recent research shows that artificial intelligence (AI) is no longer viewed only as a teaching tool. It is increasingly seen as a factor that shapes how educational organisations are led and managed. Scholars argue that AI systems now influence decisions about curriculum, assessment, staffing, and institutional planning (Williamson et al., 2023). These systems generate predictions, summaries, and recommendations that leaders use when making professional judgements (Arar et al., 2025). This shift means that leadership authority is shared between human actors and digital systems, which changes how responsibility and

accountability are understood (Birkstedt et al., 2023). Educational leadership is commonly described through three main domains: instructional leadership, administrative leadership, and ethical or moral leadership (Hallinger et al., 2025). AI affects each of these areas. In instructional leadership, AI tools support the analysis of student achievement data and classroom practices. In administrative leadership, AI automates routine tasks such as reporting and scheduling. In ethical leadership, AI creates new responsibilities related to fairness, transparency, and data protection (Holmes & Miao, 2023).

Several studies published in 2024–2025 report that AI is used to support instructional leadership. School leaders use analytics dashboards and AI-generated summaries to track student performance and identify areas for improvement (Williamson et al., 2023; Sahlgren, 2025). These tools help leaders provide more frequent and structured feedback to teachers and plan professional development activities (Sposato, 2025). However, researchers caution that heavy reliance on data may narrow the focus of instructional leadership to what can be measured easily. Important aspects of teaching, such as classroom relationships and creativity, may receive less attention if leaders depend too strongly on automated indicators (Williamson et al., 2023). This creates a tension between data-informed leadership and professional judgement.

The literature also highlights the role of AI in administrative leadership. Studies show that leaders use AI to prepare reports, manage schedules, and organise institutional records (Birkstedt et al., 2023). These applications are often associated with time savings and improved efficiency. Leaders report that automation allows them to spend more time on instructional and strategic work (Yu & Ismail, 2024). Despite these benefits, administrative uses of AI raise concerns about skill changes and dependency on technology. Leaders are expected to develop new competencies in interpreting data and overseeing digital systems (Gilli et al., 2024). Some studies warn that limited understanding of AI processes can reduce leaders' ability to question or challenge automated outputs (Madanchian et al., 2024).

Ethical and Governance Challenges

Ethical issues are a central theme in recent studies on AI and educational leadership. Researchers point to risks of biased algorithms, unclear decision processes, and misuse of personal data (Holmes & Miao, 2023; Sahlgren, 2025). When AI is used to support decisions about student support or teacher evaluation, questions arise about fairness and accountability (Williamson et al., 2023). Leaders are therefore expected to act as ethical regulators of AI use within their institutions. This includes setting rules for data use, ensuring transparency in decision-making, and involving staff in discussions about technology adoption (Manda et al., 2025). However, empirical studies show that many institutions lack formal policies for AI governance, and leaders often rely on informal or ad hoc practices (Rudko et al., 2025).

Methodological Trends and Research Gaps

Few studies use longitudinal or experimental methods to examine how AI changes leadership over time (Frimpong & Wolfs, 2024). There are also differences in how AI is defined. Some studies focus on learning analytics systems, while others examine generative AI tools. This makes it difficult to compare results across studies (Williamson et al., 2023). In addition, most research is based in high-income countries, which limits understanding of how AI affects leadership in low- and middle-income contexts (Fullan et al., 2024). Taken together, the literature shows that AI is influencing educational leadership in important waysAt the same time, it raises concerns about bias, transparency, and professional trust. The evidence remains fragmented and uneven, with wide variation in methods, definitions, and contexts.

These limitations point to the need for a systematic synthesis of recent empirical studies. A structured review can clarify how AI affects leadership roles and practices and identify common outcomes and risks. For this reason, the present study synthesises findings from selected empirical studies published during

2024–2025.

RESEARCH METHODOLOGY

Research Design

This study employed a systematic literature review (SLR) design guided by the PRISMA-2020 framework (Page et al., 2021). PRISMA was selected because it provides clear and transparent procedures for identifying, screening, and synthesising research evidence. The review aimed to ensure replicability and methodological rigour in examining recent empirical studies on artificial intelligence (AI) and educational leadership.

Data Sources and Search Strategy

A comprehensive search was conducted in six electronic databases: Web of Science, Scopus, PubMed, ERIC, DOAJ, and EBSCO. These databases were chosen to capture literature from education, social sciences, and technology-related fields. Searches were limited to peer-reviewed journal articles published between 2024 and 2025. Only articles written in English were included. The search strategy combined terms related to AI and educational leadership using Boolean operators. The core search string was "artificial intelligence" or "generative AI" or "learning analytics" or "educational leadership" or "school leadership" or "instructional leadership" or "educational management". Database-specific filters were applied to restrict results to education and social science subject areas where available. In addition, the reference lists of all included studies were manually screened to identify any further relevant articles.

Inclusion and Exclusion Criteria

Studies were included in the review if they met the following criteria:

- Published between 2024 and 2025.
- Indexed in one of the selected databases: Web of Science, Scopus, PubMed, ERIC, DOAJ, and EBSCO.
- Reported empirical findings: quantitative, qualitative, or mixed methods.
- Examined the use or impact of artificial intelligence (including generative AI or learning analytics).
- Focused explicitly on educational leadership or management (e.g., principals, school leaders, administrators, or institutional leaders).

Studies were excluded if they:

- Focused only on classroom teaching or student learning without reference to leadership.
- Were conceptual papers, editorials, commentaries, or policy briefs.
- Addressed general educational technology without a specific AI component.
- Were conference papers, theses, or non-peer-reviewed sources.

Study Selection Process

All records retrieved from the databases were exported into reference management software, and duplicates were removed. The remaining articles were screened in two stages. First, titles and abstracts

were reviewed to determine relevance based on the inclusion and exclusion criteria. Second, full-text versions of potentially eligible articles were examined in detail. Disagreements during the screening process were resolved through discussion and consensus. Following this procedure, 18 empirical studies were included in the final synthesis. The study selection process followed the PRISMA-2020 phases of identification, screening, eligibility, inclusion and reporting (Page et al., 2021).

Data Extraction, Synthesis, and Analysis

A standardised data extraction form was developed to ensure consistency across studies. For each included article, the following information was recorded:

- Author(s) and year of publication
- Country or region of the study
- Research design and sample
- Type of AI application examined
- Leadership domain addressed (instructional, administrative, or ethical)
- Key findings related to leadership practices and outcomes
- Reported challenges or risks

This process allowed systematic comparison of results across different contexts and methodologies. A thematic synthesis approach was used to analyse the extracted data. Findings from individual studies were coded inductively and grouped into broader themes aligned with the research questions. Themes were organised around:

- AI influences on leadership practices and roles
- Reported outcomes and benefits
- Risks, ethical concerns, and governance challenges

This approach enabled integration of qualitative and quantitative evidence into a coherent analytical framework.

FINDINGS

This section reports the findings of the systematic review based on the 18 empirical studies published between 2024 and 2025 that met the inclusion criteria. Results are organised by (a) study characteristics and (b) themes aligned with the two research questions.

Study Characteristics

The 18 included studies were conducted across school settings, with most originating from Europe, East Asia, North America, and Australia. Few studies were located in low- and middle-income contexts, indicating a geographical concentration of evidence (Dieterle et al., 2024; Arar et al., 2025). Qualitative designs (interviews and case studies) were most common, followed by survey-based quantitative studies and mixed-methods approaches (Fullan et al., 2024). AI was defined variably across studies, including generative AI tools, learning analytics systems, and automated decision-support platforms (Cukurova, 2025). Leadership was examined mainly in relation to instructional supervision, administrative decision-making, and institutional governance (Berkovich, 2025).

Influence of AI on Leadership Practices and Roles

Three leadership domains emerged from the synthesis: instructional leadership, administrative leadership, and ethical leadership. Most studies reported that AI supports instructional leadership by providing timely access to data on student learning and teaching practices. Leaders used dashboards, automated summaries, and predictive indicators to monitor progress and identify improvement needs (Ngubane, 2025; Fullan et al., 2024). These tools were associated with more structured feedback to teachers and more systematic planning of professional development (Rudko et al., 2025). However, several studies noted that leaders remained cautious about relying solely on algorithmic outputs and continued to stress professional judgement in interpreting data (Sahlgren, 2025; Frimpong & Wolfs, 2024).

AI was widely reported as improving administrative efficiency. Studies described its use for report preparation, scheduling, and record management (Cukurova, 2025; Manda et al., 2025). Leaders perceived these applications as reducing routine workload and allowing greater attention to strategic and instructional tasks. At the same time, findings indicated that administrative automation required leaders to develop new skills in data interpretation and system oversight (Madanchian et al., 2025). A subset of studies emphasised the ethical responsibilities of leaders in AI-supported environments. Leaders were expected to regulate data use, ensure transparency in decision-making, and protect personal information (Ahmed et al., 2025; Sahlgren, 2025). Ethical leadership was therefore treated as integral to AI adoption rather than as a separate concern (Crompton et al., 2024; Renta-Davids et al., 2025).

Outcomes and Benefits of AI-Supported Leadership

Across the reviewed studies, outcomes were generally described as positive but indirect. Commonly reported benefits included improved efficiency in administrative processes, faster access to performance data, and greater confidence in data-informed decision-making (Fullan et al., 2024; Crompton et al., 2024). Some studies suggested that AI-supported leadership strengthened strategic planning and alignment between instructional goals and organisational management (Berkovich, 2025). However, few studies provided evidence of direct causal links between leaders' use of AI and improved student achievement or teacher performance (Göçen & Döğer, 2025; Uzorka & Kalabuki, 2025).

Risks and Challenges

Despite reported benefits, the literature consistently identified several risks. Algorithmic bias and lack of transparency in automated systems were major concerns, especially where AI-supported decisions influenced teacher evaluation or student support (Gilli et al., 2024; Manda et al., 2025). Data privacy and security were also frequently discussed, given the large volumes of personal information processed by AI systems (Ahmed et al., 2025; Dieterle et al., 2024). Organisational challenges were also evident. Teacher resistance was reported in several studies, often linked to perceptions of AI as a monitoring or control tool rather than a form of support (Crompton et al., 2024; Yu et al., 2024). These findings suggest that trust, communication, and shared understanding are essential conditions for effective leadership use of AI.

Governance and Policy Issues

Governance frameworks for AI use in educational leadership were found to be uneven and often underdeveloped. While some institutions reported local ethical guidelines, many studies described a lack of formal policies regulating AI adoption and use (Manda et al., 2025; Sahlgren, 2025). Leaders were therefore required to balance innovation pressures with accountability demands in uncertain regulatory contexts (Arar et al., 2025). Several studies emphasised the value of participatory governance, in which teachers and other stakeholders are involved in decisions about AI adoption. Such approaches were associated with higher acceptance of AI tools and clearer understanding of their purposes and limits (Dieterle et al., 2024; Ahmed et al., 2025).

Overall, the results indicate that AI influences educational leadership mainly through changes in instructional and administrative practices, while also increasing ethical and governance responsibilities. The reviewed studies portray AI as a supportive tool rather than an autonomous decision-maker, with its impact shaped by leaders' interpretations, institutional capacity, and policy context. The dominance of exploratory and short-term studies highlights the need for more rigorous and longitudinal research, particularly on long-term outcomes and effective governance models for AI in educational leadership.

DISCUSSION & CONCLUSION

This systematic review synthesised findings from 18 empirical studies published between 2024 and 2025 to examine how artificial intelligence (AI) is influencing educational leadership practices and what outcomes, risks, and governance challenges are reported. The discussion interprets these findings in relation to the research questions and situates them within the broader literature on educational leadership and digital transformation.

In response to RQ1, the findings indicate that AI is reshaping leadership primarily through its effects on instructional and administrative practices. Leaders increasingly rely on AI-supported analytics and automated summaries to monitor student performance and inform professional development. This aligns with earlier arguments that data-driven technologies are extending the scope of instructional leadership by providing continuous streams of performance information (Williamson et al., 2023). Administrative leadership was similarly transformed through automation of routine tasks such as reporting, scheduling, and record management. These changes were widely associated with improved efficiency and time savings (Birkstedt et al., 2023). Such findings support claims that AI can reduce administrative burden and allow leaders to concentrate on pedagogical and strategic priorities (Frimpong & Wolfs, 2024). At the same time, the results suggest a shift in leadership competencies, with greater emphasis on data interpretation and system oversight.

Regarding RQ2, the reviewed studies reported mostly positive intermediate outcomes, such as increased efficiency, faster access to information, and greater confidence in evidence-based decision-making. These findings are consistent with broader AI-in-education literature that highlights operational benefits rather than direct instructional gains (Holmes & Tuomi, 2022). However, the absence of strong causal evidence linking AI-supported leadership to improved student outcomes suggests that the impact of AI is mediated by organisational context and leadership capacity. This supports the argument that technology alone does not produce educational improvement; rather, it is the way leaders integrate tools into existing practices that shapes outcomes (Birkstedt et al., 2023).

A key contribution of this review is the identification of ethical leadership as a core dimension of AI adoption. Concerns about bias, transparency, and data privacy were consistent across studies (Holmes & Miao, 2023; Williamson et al., 2023). Leaders are thus positioned as ethical gatekeepers who must regulate how AI is used and ensure that it aligns with educational values. The findings also reveal weaknesses in existing governance arrangements. Many institutions lack formal policies to guide AI use, leaving leaders to rely on informal practices or external vendor guidelines. This supports calls for clearer regulatory frameworks and participatory governance models that involve teachers and other stakeholders in decision-making (Crompton et al., 2024). Such approaches may reduce resistance and improve transparency, thereby strengthening organisational trust.

Implications

The results have implications for educational leadership theory. Traditional models of leadership emphasise vision, relationships, and professional judgement. The reviewed studies suggest that these elements now coexist with algorithmic systems that shape how problems are defined and how solutions

are proposed. Leadership can therefore be understood as a hybrid practice that combines human interpretation with machine-generated information. AI does not replace leadership but changes its conditions of practice by introducing new sources of authority and new forms of accountability. For practice, the findings suggest that leadership preparation and professional development should include AI literacy, data ethics, and governance skills. Leaders need support in understanding how AI systems work, how their outputs should be interpreted, and how risks can be mitigated. For policy, the review highlights the need for clear institutional and system-level guidelines that define acceptable uses of AI, protect personal data, and ensure transparency in decision-making. Without such frameworks, AI adoption risks increasing inequality and undermining trust.

LIMITATIONS AND DIRECTIONS FOR FUTURE RESEARCH

Although this review synthesised 18 studies, most were exploratory and cross-sectional. Longitudinal and experimental research is needed to assess how AI influences leadership over time and whether it leads to sustained improvements in organisational performance. Further research is also required in low- and middle-income contexts, where resource constraints and governance challenges may shape AI adoption differently. In addition, future studies should adopt clearer definitions of AI and leadership and develop common analytical frameworks to enable stronger comparison across contexts.

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