

Education Management by Education Field Officers in the Artificial Intelligence Era: A Mini-Review

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Abstract

This mini-review examines how artificial intelligence (AI) is reshaping education management by Ministry of Education (MOE) field officers at the region, county and sub-county levels in Kenya and similar settings. It focuses on administrative automation, decision support, monitoring and evaluation, human resource management, and data governance. The review finds that AI can improve efficiency, timeliness, and the use of evidence in decision-making, while also strengthening supervision and planning. However, adoption remains constrained by weak infrastructure, varying levels AI literacy, fragmented systems, poor data quality, financial pressure, ethical concerns, and regulatory uncertainty. The paper argues that AI should augment, not replace, professional judgment. Successful implementation will require investment in digital infrastructure, staff capacity building, interoperable systems, data governance, ethical safeguards, explainable tools, and clear policy frameworks.

Keywords

Artificial Intelligence (AI), Education Field Officers, Education Management, Education Management Information Systems (EMIS), Digital Transformation

1. Introduction

The management of education in Kenya has a defined structure from the Ministry of Education (MOE) headquarters to the school level through the region, county, and Sub County. The information flow has evolved from physical movement of letters in the early years to the current digital systems such as email and now AI.

The digital evolution demands that the MOE restructures the communication systems from hard copy, physical inspection-centred administration to real-time digitally-driven model. MOE field officers who include Regional, County, and Sub-County Directors of Education, as well as the Quality Assurance and Standards Officers (QASOs) deployed at each administrative level are key operational agents of education governance. They are responsible for implementing education policies, coordinating and supervising education programmes, monitoring compliance with legal and quality standards, supporting institutional improvement, and providing technical guidance to schools and other education stakeholders (Republic of Kenya, 2013; Ministry of Education, 2015). Collectively, they serve as the critical link between national education policy and its effective implementation at regional, county, sub-county, and institutional levels. Historically, these officers relied on school visits, paper reports, compliance checks, and reactive problem-solving (Mwaniki, 2017; Wanzare, 2012; Nyonje & Kidombo, 2024). Though still useful in the contemporary period, manual and management-by-walking-around approach are increasingly becoming inadequate in the context characterized by evidence-driven decision making drawn from growing enrolment, expanding curricular demands, rising public expectations, rapid digitization, and the increasing use of educational data for governance (Williamson, 2017). Increasingly, education management in MOE is shifting from manual, inspection-centred administration to a more data-informed and digitally connected model.

In this context, AI represents an important development in education management, but it should be conceptually distinguished from broader digital transformation and education management information systems (EMIS). Digital transformation, EMIS modernization, data analytics, and AI should not be treated as synonymous. An education management system may be digital, cloud-based, integrated, real-time, interoperable, or dashboard-driven without necessarily incorporating artificial intelligence. EMIS primarily provides the infrastructure for collecting, integrating, managing, reporting, and using education data, whereas AI refers to computational methods capable of performing tasks such as pattern recognition, prediction, classification, natural-language processing, anomaly detection, or recommendation that ordinarily require aspects of human intelligence. This distinction is important because established EMIS capabilities should not retrospectively be labelled as AI simply because they enable data-driven decision-making. Rather, AI should be understood as a potential advanced analytical layer that can operate on and derive additional value from sufficiently mature education information infrastructures. Within this conceptual boundary, AI can strengthen education management through advanced decision support, predictive analysis, automation, and intelligent interpretation of complex datasets, consistent with UNESCO's recognition of AI as an important technology for educational transformation and with OECD evidence that effective AI adoption requires system-level policy, governance, and institutional readiness (UNESCO, 2023; Miao & Holmes, 2023; Boronovi et al., 2025; Gao & Chen, 2025; OECD, 2026; UNESCO,

2026).

AI has emerged as one of the key technologies underpinning the Fourth Industrial Revolution (4IR), a period characterized by the convergence of digital, physical, and biological technologies (Schwab, 2017; Miao & Holmes, 2023). AI, together with related technologies such as big data, robotics, the Internet of Things, and advanced analytics, is transforming how organizations generate information, automate processes, support decision-making, and deliver services (Brynjolfsson & McAfee, 2017; Miao & Holmes, 2023). MOE field officers now need tools that can help reinvigorate their capacities to process large volumes of information, identify patterns, support schools, and respond faster to emerging challenges. AI can build upon education management information systems (EMIS), dashboards, mobile data tools, cloud platforms, analytics, and big-data infrastructures to provide more advanced analytical and decision-support capabilities (Williamson, 2017; Hua & Herstein, 2003; Cox, 2021; Gao & Chen, 2025). Where AI capabilities are appropriately integrated, they can extend the efficiency and data-use functions already provided by digital systems and analytics by automating selected repetitive tasks, identifying patterns, supporting prediction, and facilitating data-informed decision-making (Slaitan, 2025). Consequently, digital outputs empower field officers to move beyond routine clerical work to navigate context-sensitive challenges, deliver targeted mentorship, and ensure more robust policy implementation across their jurisdictions (Maskanah et al., 2026; Abd Rani et al., 2019).

Furthermore, the integration of these sophisticated tools facilitates a transition towards proactive resource allocation and predictive management, effectively addressing complex administrative hurdles. Ultimately, the fundamental shift brought about by the advent of AI and other online tools in education enhances the role of field education officers from standard data processing to strategic oversight. Consequently, AI is redefining the professional role of MOE field officers. Rather than functioning primarily as inspectors and administrators, officers are increasingly becoming strategic education managers who use AI-generated evidence to anticipate risks, guide interventions, mentor schools, and support policy implementation. Importantly, AI complements rather than replaces professional judgment, requiring education professionals to combine AI-supported insights with ethical reasoning, contextual interpretation, and human decision-making (Holmes et al., 2019; Schiff, 2022; Miao & Holmes, 2023; Mifsud et al., 2026; Mustafa et al., 2024; Karaköse & Tülübaş, 2024; Filgueiras, 2024; OECD, 2026). Thus, the significance of AI for education extends beyond classroom applications to the governance and management of education systems, particularly the work of field officers responsible for translating policy into practice.

2. Why MOE Field Officers in the AI Era?

Education management in Kenyan context continues to be constrained by fragmented data systems, slow reporting cycles, weak analytical capacity, insufficient supervisory coverage attributed to technical staffing shortage, inadequate infra-

structure, and reported inefficient distribution of resources (UNESCO, 2023; Reimers et al., 2025a; Onsomu et al., 2025). MOE field officers within the State Department for Basic Education frequently operate in environments characterized by delayed, incomplete, inconsistent, or missing information, making evidence-based decision-making difficult, particularly in Kenya's arid and semi-arid lands (ASALs) and other hard-to-reach and understaffed areas (Ministry of Education, 2023; UNESCO, 2023). As educational data becomes increasingly voluminous and complex, traditional manual approaches to education management are becoming slower, more error-prone, and less responsive. Administrative bottlenecks, delayed communication, growing workloads, and declining data accuracy continue to reduce productivity and divert skilled officers from their core supervisory and support functions. In Kenya, the National Education Sector Strategic Plan (NESSP) 2023 - 2027 identifies weaknesses in internal processes, data management, and the integration of technology into administrative functions, while emphasizing the need to strengthen evidence-based decision-making and institutionalize integrated data and information management systems (Ministry of Education, 2023). Emerging evidence indicates that AI can enhance education administration and management through the automation of routine administrative tasks, data analysis, predictive analytics, and decision-support systems (Renta-Davids et al., 2025). In particular, AI-supported decision-making can improve the efficiency and accuracy of data-informed educational leadership, although concerns regarding algorithmic bias, transparency, privacy, and accountability require human oversight (Wang, 2021). Kenya's ongoing digitalization of education management, including the transition from NEMIS to Kenya Education Management Information System (KEMIS), further provides an important infrastructure for strengthening data-driven planning, monitoring, and management across the education sector (Ministry of Education, 2023). These developments suggest that AI should not be viewed merely as an efficiency-enhancing technology. Rather, when implemented responsibly and within appropriate governance and ethical safeguards, it can serve as a catalyst for transforming education management by enabling education field officers to move from predominantly reactive administration towards more proactive, predictive, and evidence-informed leadership. Such transformation should remain human-centred, with AI augmenting rather than replacing professional judgment and accountability (Miao & Holmes, 2023; Wang, 2021).

Despite these potential benefits, important questions remain regarding how AI can be adopted responsibly, ethically, and effectively to support the work of MOE field officers. These concerns are consistent with the Organization for Economic Co-operation and Development (OECD) analysis indicating that successful AI adoption depends not only on technological capability but also on governance arrangements, institutional readiness, workforce competencies, and coherent policy frameworks (Borgonovi et al., 2025). Existing studies highlight concerns that, if poorly governed, AI may reinforce existing inequalities, perpetuate algorithmic

bias, undermine transparency and accountability, and encourage excessive reliance on automated decision-making (UNESCO, 2021; Miao & Holmes, 2023; Holmes & Tuomi, 2022). At the same time, Kenya has initiated policy reforms and pilot programmes that seek to integrate AI into education administration and service delivery (Government of Kenya, 2025; Omwenga et al., 2025). However, the available evidence remains fragmented, with limited synthesis of the opportunities, challenges, readiness requirements, governance considerations, and implications of AI adoption for MOE field officers. Furthermore, systemic barriers—including inadequate digital infrastructure, limited AI and data literacy, and disparities in technological capacity, particularly in ASAL and other underserved regions—may constrain successful implementation (Shikokoti & Reuben, 2024).

Within the MOE leadership structure, field officers serve as an important link between national policies and their implementation at the school level. Despite this role, published research specifically addressing the evolving responsibilities of MOE field officers in the AI era remains sparse compared with the literature on high-level policymakers and school-level management. Similarly, empirical evidence on the operational use of AI by MOE field officers for supervision, logistical coordination, and professional mentoring within Kenya's low-resource public education system remains limited. Most AI-in-education research has focused on classroom teaching, assessment, and learner support rather than the routine administrative work of quality assurance officers, school inspectors, curriculum support officers, and subcounty, county and regional education directors. Existing literature suggests that AI could help automate inspection reports, flag schools needing urgent intervention, summarize monitoring findings, and draw recommendations from EMIS data, but these uses are still largely at pilot or conceptual stage rather than documented routine practice in ministries, including in Kenya (Omwenga et al., 2025).

The evidence is similarly weak for logistics and mentoring. AI is widely presented as promising for teacher deployment, resource allocation, visit scheduling, and forecasting staffing or textbook needs, yet there are few operational evaluations showing real gains in ministry systems (Renta-Davids et al., 2025; Slaitan, 2025). For mentoring, generative AI could support policy interpretation, draft reports, provide coaching prompts, and retrieve guidance from official documents, but published studies rarely show field officers using these tools regularly in day-to-day work (Matere, 2024; Yego & Mose, 2025). Overall, the main barriers are low institutional readiness, fragmented data systems, weak connectivity, limited technical capacity, and governance concerns around privacy, transparency, and accountability, which helps explain why AI in MOE administration remains more aspirational than operational (Renta-Davids et al., 2025; Slaitan, 2025).

This review therefore seeks to address the following overarching question: *What does the existing literature reveal about the emerging roles, opportunities, challenges, ethical considerations, and readiness requirements MOE field officers in the AI era?* The literature suggests that the progressive digitalization and mod-

ernization of EMIS, together with the emerging application of AI and advanced analytics, may substantially influence how field officers operate in the field. Existing evidence suggests that the AI era is redefining the professional identity of MOE field officers. Their responsibilities are increasingly centred on three complementary functions: data-driven quality assurance, intelligent logistics and equity management, and strategic policy interpretation and ethical leadership. By synthesizing current evidence, the review aims to identify knowledge gaps, highlight best practices, and provide insights to inform policy, capacity building, and future research on AI-enabled education management.

3. Aim and Methods of Mini-Review

The mini-review assesses the current and emerging use of AI in education management in Kenya and the wider global context. It also examines how AI is reshaping the professional role of MOE field officers, potentially shifting their functions from predominantly administrative inspection towards strategic, data-driven education management, while identifying the opportunities, risks, and policy priorities associated with AI-supported administration. This mini-review adopted a scoping review methodology to systematically map and synthesize the rapidly expanding literature on AI in education management, with particular emphasis on the evolving roles of MOE field officers. This method was deemed appropriate because AI-supported education management is an emerging, multidisciplinary field encompassing diverse evidence, including empirical studies, conceptual papers, and policy documents. Unlike systematic reviews that address narrowly defined intervention questions, scoping reviews are designed to examine the breadth of available evidence, identify key concepts, map research trends, and highlight knowledge gaps across heterogeneous study designs (Arksey & O'Malley, 2005; Levac et al., 2010; Tricco et al., 2018). The review followed the five-stage framework proposed by Arksey and O'Malley (2005) and refined by Levac et al., (2010), while reporting was guided by the PRISMA Extension for Scoping Reviews (PRISMA-ScR) to enhance methodological transparency and reproducibility (Tricco et al., 2018). The review addressed the question: *What does the existing literature reveal about the emerging roles, applications, opportunities, challenges, ethical considerations, and readiness requirements for Ministry of Education field officers in the era of Artificial Intelligence?*

A comprehensive literature search was conducted across Scopus, ScienceDirect, Web of Science, ERIC, Google Scholar, and ResearchGate for publications published between 2017 and July 2026, reflecting the period of rapid advances in machine learning and generative AI. Search terms combined keywords such as *Artificial Intelligence*, *Education Management*, *Educational Administration*, *School Inspection*, *Education Field Officers*, *Educational Leadership*, *Education Management Information Systems (EMIS)*, *Educational Governance*, *Quality Assurance*, *School Supervision*, and *Digital Transformation* using Boolean operators. Reference lists of relevant publications were also manually searched to improve cover-

age, consistent with recommended scoping review practices (Levac et al., 2010). Eligible studies included English-language peer-reviewed journal articles, conference papers, policy reports, and institutional publications addressing AI applications in educational administration, governance, leadership, EMIS, and related management functions. Studies focusing exclusively on AI-supported teaching and learning without implications for educational management, together with editorials, opinion pieces, duplicates, and non-English publications, were excluded. Titles, abstracts, and full texts were screened sequentially, with emphasis placed on peer-reviewed literature and authoritative publications from organizations such as UNESCO, the OECD, the World Bank, and national ministries of education. Although formal quality appraisal is not mandatory in scoping reviews, priority was given to methodologically rigorous and policy-relevant sources (Arksey & O'Malley, 2005; Tricco et al., 2018).

Data were extracted using a standardized charting framework adapted from Levac et al. (2010), capturing publication characteristics, study design, AI application domains, education management context, reported benefits, implementation challenges, ethical and governance considerations, institutional readiness, and key recommendations. The evidence was synthesized thematically rather than statistically owing to the conceptual diversity of the included studies. Consistent with recent scoping reviews of AI in educational administration (Onia & Elkhder, 2026), the findings were organized into themes covering AI applications in education management, the changing roles of MOE field officers, benefits, implementation challenges, ethical and governance issues, institutional readiness, global experiences, policy implications, and research gaps. As the review relied exclusively on publicly available literature, ethical approval was not required. Nevertheless, the study adhered to principles of academic integrity through transparent reporting, accurate citation, and faithful representation of the evidence, providing a rigorous and flexible synthesis to inform future research, policy, and AI-enabled education management. The findings provide a concise overview of the emerging role of AI in enhancing the effectiveness and efficiency of education management by education field officers.

A central methodological principle of this review is the distinction between digital transformation, EMIS modernization, conventional analytics, and artificial intelligence. These concepts are related but not interchangeable. Digital systems and EMIS may support data collection, storage, reporting, dashboards, data sharing, geographic information systems (GIS), resource management, and real-time information flows without using AI. Consequently, the review did not classify a system as AI merely because it was digital, integrated, cloud-based, interoperable, real-time, dashboard-driven, or capable of conventional business intelligence or analytics. Established capabilities of education information systems, including those associated with Kenya's former NEMIS, are not retrospectively interpreted as AI simply because they enabled sophisticated information management or data-informed decision-making. For the purposes of this review, AI refers specif-

ically to computational approaches that provide capabilities such as machine learning, prediction, pattern recognition, automated classification, anomaly detection, natural-language processing, recommendation, or other forms of intelligent decision support. This distinction was applied during the literature screening, data extraction, and thematic synthesis to avoid conflating established digital infrastructure with emerging AI applications.

4. AI Applications in Education Management

International evidence indicates that AI is increasingly transforming educational administration through automation, decision support, predictive analytics, and intelligent information management (Kakungulu, 2025; Feng & Li, 2024). The fastest-growing firms today are not waiting for the future—they are already using AI to make better decisions, move faster, cut costs, and find new openings. Internationally, documented evidence shows that AI is being applied in selected education systems and organizations to perform several administrative functions, although implementation varies considerably across countries and institutions (Cabral et al., 2025; Ncube et al., 2025). In many Ministries of Education, particularly in low- and middle-income settings, these applications remain at pilot, early-adoption, or conceptual stages rather than routine operational practice (Kakungulu, 2025; Feng & Li, 2024; Cabral et al., 2025; Ncube et al., 2025).

Against this backdrop, the emerging applications of AI in education management can be grouped into several key administrative functions. First, it has automated repetitive tasks such as document handling, report generation and compilation, and data validation (Feng & Li, 2024; UNESCO, 2026). This has reduced the duplication, speeded up communication, and lowered the risk of clerical errors (Mustafa et al., 2024; OECD, 2026; Onia & Elkhder, 2026). Second, predictive analytics, has been reported to support planning in some education systems, while in many ministries of education, its use remains under pilot evaluation or in the early stages of implementation. (Dogaru, 2026). Third, AI-enabled dashboards and alerts have demonstrated potential to strengthen monitoring and evaluation, with documented implementation in selected jurisdictions but limited evidence of routine ministry-wide deployment (OECD, 2026; Gao & Chen, 2025; 2024; OECD, 2021). Fourth, emerging evidence suggests that AI can support human resource management through predictive analysis of deployment, attendance, appraisal, workload, and professional development. However, most published evidence comes from conceptual studies, pilot projects, or institutional case studies, with limited evidence of routine ministry-wide implementation (Onia & Elkhder, 2026; Ncube et al., 2025; Bositkhanova & Dadaboyev, 2025; Ekuma, 2024; Ajuwon et al., 2024; Karaköse & Tülübaş, 2024; Kafa, 2025). Fifth, AI has the potential to improve data management within EMIS by supporting automated data cleaning, integration, validation, anomaly detection, and visualization from multiple data sources. However, these capabilities depend on the maturity of the underlying EMIS ecosystem, including governance, organizational processes, technical archi-

architecture, data quality, interoperability, and effective data use (UNESCO, 2025). Although AI-enabled EMIS applications are increasingly being explored, evidence indicates that implementation remains largely at the pilot or early-adoption stage rather than routine operational practice (D’Rozario, 2025; Onia & Elkhder, 2026).

Across these emerging applications, AI primarily provides analytical support by identifying patterns, generating alerts, and synthesizing large volumes of data, while education field officers contribute contextual interpretation, ethical reasoning, stakeholder engagement, and final professional judgment. This complementary, human-centred approach emphasizes that AI systems should be designed around users’ needs and organizational contexts, particularly in developing countries where institutional realities strongly influence technology adoption, and that AI augments rather than replaces professional expertise in education management (Familoni & Onyebuchi, 2024; Miao & Holmes, 2023; Filgueiras, 2024; OECD, 2026; Renta-Davids et al., 2025; Chen & Ma, 2026). Consequently, AI is best understood as a decision-support tool that enhances, rather than substitutes for, the professional responsibilities of education managers.

5. Changing Roles of Ministry of Education Field Officers

The era of AI is fundamentally reshaping the professional identity and functions of MOE field officers. Traditionally regarded primarily as inspectors, compliance officers, and administrators, they are increasingly assuming roles as strategic actors in education management, integrating AI-assisted analysis of educational data and evidence with professional expertise to strengthen planning, supervision, equity monitoring, policy implementation, and continuous school improvement (Ly & Huong, 2024; Miao & Holmes, 2023; Government of Kenya, 2025; Karaköse & Tülübaş, 2024; Pesek, 2026; OECD, 2026). This transformation reflects the broader evolution of educational leadership from administrative control towards instructional, transformational, and strategic leadership (Bush, 2020; Cox, 2021; OECD, 2026). While core professional values such as integrity, accountability, confidentiality, fairness, and professionalism remain fundamental, officers increasingly require digital literacy, data interpretation skills, and competence in using AI-enabled decision-support tools (OECD, 2026; Mifsud et al., 2026; OECD, 2024; Karaköse & Tülübaş, 2024; Reimers et al., 2025a). Their expanding responsibilities include data interpretation, digital coordination, change management, and support for educational innovation. This evolution does not imply the replacement of field officers by technologists; rather, it points towards a human-AI partnership in which technological capabilities complement professional expertise (Filgueiras, 2024; OECD, 2026; Miao & Holmes, 2023).

AI can perform computational tasks at a scale and speed beyond human capacity, including analysing large datasets, identifying patterns, generating forecasts, and producing recommendations. However, such outputs require professional interpretation because education decisions are context-dependent, socially complex, and ethically sensitive. Consequently, AI should augment rather than replace

professional judgment, while field officers retain responsibility for accountability, stakeholder engagement, contextual interpretation, and final decision-making (Filgueiras, 2024; OECD, 2026). Accordingly, an effective model of AI-enabled education management is one in which appropriately deployed automation reduces routine administrative work while enabling field officers to devote greater attention to professional support, collaboration, supervision, capacity building, problem-solving, and sustained school improvement.

6. Benefits of AI in Education Management

The main benefits of AI in education management include enhanced efficiency, improved promptness, stronger accountability, better resource allocation, and more responsive support to schools. AI helps develop automated job scheduling and analyzing data to eliminate administrative workload, giving room for field officers to refocus most of their time on interacting with educators and providing mentoring support at the school level (Selmi Arrooqi & Miqad Alruqi, 2025; Ghamrawi et al., 2024). AI also helps officers make faster and better-informed decisions, standardizes processes, and improves transparency. Further, it helps identify schools at risk of poor performance, dropout, or non-compliance, enabling earlier intervention. When linked to national planning systems, AI can improve alignment between field-level evidence and upper-level policy decisions. Collectively, these benefits illustrate that AI transforms education management by shifting officers from routine administrative work toward strategic leadership, mentoring, policy implementation, and evidence-informed decision-making. However, these gains depend less on the technology itself than on institutional readiness and effective human-AI collaboration.

7. AI and Education Management in Kenya

Kenya has made visible progress in digital transformation in education management through investments in digital infrastructure, digital government services, and education data systems such as KEMIS. NESSP 2023 - 2027 identifies the development, enhancement, and institutionalization of KEMIS as strategic priorities for strengthening education data and decision-making (Kenya Education Management Information System, n.d.). These developments should, however, be distinguished from AI adoption. KEMIS and earlier education information systems provide digital infrastructure for data collection, integration, management, reporting, and evidence-informed decision-making; the existence of these capabilities does not in itself establish the use of AI. Similarly, the presence of dashboards, business intelligence, GIS, data sharing, cloud infrastructure, or real-time reporting should not automatically be interpreted as evidence of AI. Rather, these capabilities constitute an important technological and institutional foundation upon which AI-enabled applications may subsequently be developed. Where appropriately implemented, AI could build on this infrastructure to support advanced functions such as predictive analysis, anomaly detection, intelligent classification,

automated document processing, and decision support. The effectiveness of such applications will nevertheless depend on data quality, governance, interoperability, infrastructure, and institutional capacity. UNESCO identifies the potential of AI and digital technologies to improve educational management while emphasizing the need for equitable, inclusive, and human-centred implementation (UNESCO, 2024c). KEMIS therefore represents more than a new information system; it provides the digital foundation upon which AI-enabled education management can evolve from reactive administration toward predictive, data-driven governance.

UNESCO (2025) provides an important systems perspective through the Education Management Information Systems Progress Assessment Tool for Transformation (EMIS-PATT), which conceptualizes EMIS as a foundational component of education-system governance, planning, monitoring, and decision-making across administrative levels. The framework emphasizes that effective education management depends not merely on the existence of a digital information system but on the alignment of governance arrangements, organizational and management processes, technical architecture, data quality, and effective use of information. This perspective is particularly relevant to Kenya's transition from NEMIS toward KEMIS because AI-enabled education management will depend on the maturity, interoperability, reliability, and usability of the underlying education data ecosystem. Importantly, however, EMIS modernization and AI adoption should be regarded as related but distinct processes. A mature EMIS can support sophisticated reporting, dashboards, business intelligence, GIS, data sharing, and resource-management functions without necessarily incorporating AI. AI represents a potential additional analytical and decision-support capability that can build upon such infrastructure. Thus, KEMIS should be viewed as part of the institutional and technological foundation upon which advanced analytics and, where appropriate, AI-supported decision-making may be developed. For Ministry of Education field officers, the value of future AI applications will consequently depend on whether KEMIS and related systems provide timely, accurate, interoperable, and contextually relevant information that can be translated into actionable intelligence for supervision, resource allocation, monitoring, and school improvement (UNESCO, 2025).

8. Global Experiences

Globally, AI is increasingly influencing both teaching and educational administration, although the extent of operational implementation varies substantially across countries, reflecting differences in policy frameworks, governance structures, institutional readiness, and investment in AI capacity (Miao et al., 2021; UNESCO, 2023; Borgonovi et al., 2025; OECD, 2024). High-income countries have generally moved faster in their adoption of AI in education leadership and management because of their stronger infrastructure, larger budgets, and more mature data systems while in many developing countries, adoption is uneven but growing, with

promising initiatives in education analytics, report automation, and learner support (UNESCO, 2023; World Economic Forum, 2023). For example, Singapore offers a useful international example of AI-enabled education management. Its Ministry of Education has progressively integrated digital platforms, data-driven systems, and AI-enabled tools to support teaching, assessment, administrative efficiency, and education-sector planning, within a broader national framework for responsible AI adoption and digital governance (Ministry of Education Singapore, 2026; Smart Nation Singapore, 2026). Although the governance structure differs from Kenya's, these experiences demonstrate how AI can enhance the work of MOE field officers by improving inspection efficiency, evidence-based supervision, and timely decision-making.

Comparable trends are also evident across African education systems, where the digital transformation of education management is increasingly viewed as a strategic response to persistent challenges in quality assurance, instructional supervision, teacher professional support, and evidence-based decision-making. Many countries have progressively strengthened EMIS, digital school inspection platforms, and electronic reporting systems to improve monitoring, accountability, and policy implementation. Although empirical evidence documenting the routine use of AI by education field officers remains limited, ongoing continental and national digital education reforms are establishing the institutional, technological, and governance foundations necessary for integrating AI-enabled supervision, predictive analytics, automated reporting, intelligent decision-support systems, and data-driven resource allocation into future education management practices (UNESCO, 2023; UNESCO, 2024a; UNESCO, 2024b; African Union, 2024; World Bank, 2023).

Against this global backdrop, the implications of AI are particularly significant for MOE field officers, who serve as the critical link between national education policy and school-level implementation. As frontline officers responsible for ensuring policy compliance, supporting schools, and strengthening accountability, they can leverage AI to improve efficiency, accuracy, responsiveness, and evidence-informed service delivery. Despite the advancements made in AI governance in education, there is not yet a widely accepted model for its effective application in educational administration. The international dimensional perspective indicates that AI implementation can be successful through the combination of various factors in addition to technological aspects, such as governance, institutional capacity, ethical considerations, and stakeholder involvement (Miao & Holmes, 2023; Chan, 2023; Reimers et al., 2025b). Similarly, global experience consistently demonstrates that successful AI adoption depends less on technological sophistication than on institutional readiness and human capacity. Countries achieving meaningful transformation have invested simultaneously in digital infrastructure, interoperable data systems, AI competencies, governance frameworks, and ethical oversight while maintaining strong human leadership throughout decision-making.

International experience also indicates that meaningful AI adoption in education management depends not on technological sophistication alone, but on institutional readiness, reliable and interoperable data systems, professional capacity, effective governance, and sustained human oversight. EMIS provides an important foundation for planning, monitoring, resource allocation, and evidence-informed decision-making, but EMIS should not be equated with AI. Digital EMIS capabilities can support sophisticated information management and analytics without incorporating artificial intelligence. AI may subsequently build upon mature EMIS infrastructure by providing advanced capabilities such as prediction, pattern recognition, anomaly detection, classification, and intelligent decision support. Consequently, investment in AI and data literacy, professional development, data quality, interoperable systems, and responsible governance is essential for enabling MOE field officers to use AI effectively while retaining professional and contextual judgment (Schildkamp et al., 2019; UNESCO, 2025).

9. Challenges and Risks for AI Adoption among Education Field Officers

The adoption of AI by MOE field officers presents significant opportunities for improving education leadership and management both at the national and lower levels. However, several challenges limit its effective implementation. Key barriers include inadequate digital infrastructure, particularly unreliable internet, electricity, and limited ICT resources in many County and Sub-County offices and more so the hard to reach and staff areas of the ASAL, which constrain AI-enabled monitoring and decision-making (World Bank, 2020; Mallik & Gangopadhyay, 2023). Data quality issues and limited interoperability between education-sector information systems, including NEMIS and TSC-linked databases, may reduce the accuracy and reliability of AI-generated insights because AI systems depend on high-quality, integrated, and consistent data for effective decision-making (European Commission, 2020; UNESCO, 2023). The Ministry of Education acknowledges that effective monitoring and evaluation are hindered by fragmented education information systems and the need to improve the quality, timeliness and harmonization of education data. Weak or incomplete data in MOE can produce inaccurate outputs that may result in misleading analyses, erroneous reports adversely affecting planning, funding, monitoring, and overall service delivery as has been noted elsewhere (Sigdel, 2022). Accordingly, until data quality and system integration are sufficiently strengthened, the reliability of any advanced analytics or AI-supported decision-support tools available to MOE field officers will remain constrained by the quality of the underlying education data. UNESCO (2025) emphasizes that strengthening EMIS requires a systems approach that considers governance, organizational and management arrangements, technical architecture, and data and their use. This is particularly important for AI-enabled education management because weaknesses in any of these dimensions can constrain the reliability, scalability, and legitimacy of AI-supported decision-making. Consequently, AI readiness should not be assessed

solely in terms of access to AI tools or staff digital skills; it should also encompass the maturity of the underlying EMIS ecosystems, including data quality, interoperability, institutional governance, technical infrastructure, and the capacity of education officials to use data effectively.

Limited AI-related digital competencies, resistance to organizational change, and concerns over job displacement may also hinder adoption, highlighting the need for continuous capacity building. Ethical and legal issues—including data privacy, algorithmic bias, transparency, accountability, and compliance with the Data Protection Act, 2019—must also be addressed to ensure responsible AI use in education management, while strengthening AI literacy and ethical competencies among education managers (Schiff, 2022; UNESCO, 2021; Porayska-Pomsta et al., 2023). In addition, AI implementation requires sustained investment in ICT infrastructure, cybersecurity, cloud services, maintenance, and staff training, which may be constrained by limited education budgets. Financial sustainability is also a concern because AI requires investment in infrastructure, software, maintenance, training, and upgrades. In Kenya and similar contexts, these barriers are magnified by uneven digital readiness across regions and institutions. Ultimately, successful AI adoption depends not only on access to AI technologies but also on institutional readiness, including digital capabilities, organizational culture, leadership support, infrastructure, professional capacity, and appropriate governance (Ly & Huong, 2024; OECD, 2026; Elmourad et al., 2026). Its effective implementation requires reliable infrastructure, interoperable education information systems, high-quality data, AI competencies, governance frameworks, cybersecurity, sustainable financing, and ethical safeguards that preserve transparency and public trust.

To ensure responsible AI use in education management, AI-generated analyses should serve only as decision-support tools rather than binding administrative decisions. Final decisions should remain with the responsible MOE field officer (e.g., QASO, Sub-County Director, County Director, Regional director or other authorized officers), who retains the legal and professional accountability (Republic of Kenya, 2013) and may override AI recommendations based on professional judgment, statutory requirements, local evidence, or contextual factors, with reasons documented to enhance transparency and organizational learning. Before AI informs policy or operational decisions, routine data-quality checks (completeness, accuracy, timeliness, consistency, and interoperability of KEMIS and related datasets) together with periodic algorithmic bias and performance audits should be undertaken. Schools should also retain access to established review and appeals mechanisms to challenge AI-informed decisions, submit additional evidence, correct inaccurate data, and obtain human reconsideration. These governance arrangements strengthen transparency, accountability, explainability, procedural fairness, and human oversight, which are widely recognized as core principles of trustworthy AI in education and the public sector (Floridi & Cows, 2019; UNESCO, 2021, 2023; OECD, 2023; European Commission, 2020; Batool et al.,

2025; Reimers et al., 2025b; Winecoff & Bogen, 2025).

10. Future Directions

The future of education management will be determined not by the extent of automation but by the quality of human-AI collaboration. Future progress in AI for education leadership and management depends on prioritizing four key areas: capacity development, policy development, research, and technology design (Pei et al., 2026). As the Kenyan education system's transition to Competency-Based Curriculum/Competency-Based Education (CBC/CBE) continues to gather pace, the role of AI in education management cannot be overstated. Emerging evidence suggests that AI can support the implementation of CBE through improved data-driven planning, curriculum monitoring, competency tracking, and decision support for education managers (Rugut, 2026; Government of Kenya, 2023; Ministry of Education, 2023; UNESCO, 2024a; Ondiba & Kiprop, 2025). Kenya has long supported the UN and AU goals of industrial growth through STEM and has made a deliberate effort having 60% of learners in senior school go through the pathway (Government of Kenya, 2023; Ministry of Education, 2023; UNESCO, 2024a). Consequently, during this transition, AI is no longer just a buzzword among MOE field officers. It is becoming a fundamental workplace skill that every field officer must possess to work effectively and efficiently. It is also no longer enough to simply know how to use a computer; practical application of digital technologies, particularly AI, has become essential. Therefore, MOE field officers must develop proficiency in AI literacy, analytical skills, ethical competence, and the use of AI-driven decision-support systems. Beyond using AI technologies, officers should also understand the ethical, societal, and governance implications of AI, including principles of beneficence, non-maleficence, autonomy, justice, and explicability that underpin trustworthy AI (Floridi & Cowls, 2019; Schiff, 2022; Pei et al., 2026).

In the Kenyan context, this transformation has particular significance for the implementation and quality assurance of CBC/CBE. As CBC/CBE places greater emphasis on learner-centred pedagogy, competency development, continuous assessment, differentiated learning, and evidence-informed support, education field officers will require timely and reliable data to monitor implementation, identify gaps, support schools, and inform corrective interventions. Properly governed AI could strengthen these functions by enabling more efficient analysis of school-level data, identification of emerging implementation challenges, targeted supervision, and evidence-based decision-making. AI will therefore not replace MOE field officers; rather, when appropriately integrated with professional expertise and human oversight, it can expand their capacity to support effective, equitable, accountable, and context-responsive implementation of CBC/CBE and broader education policy objectives.

Another important priority is the systematic assessment and strengthening of KEMIS maturity before and alongside the development or deployment of AI applications. UNESCO (2025), through the EMIS-PATT, provides a systems-oriented

approach for diagnosing the strengths and weaknesses of national EMIS and identifying realistic pathways for improvement. The framework considers governance, management and organizational arrangements, technical and information-technology architecture, and data and data use. Applied to Kenya, such an approach could provide a useful readiness framework for determining whether KEMIS and associated education information systems will be sufficiently reliable, interoperable, governed, and usable to support AI-enabled education management. Future AI implementation should therefore proceed through a phased pathway in which EMIS strengthening, data governance, interoperability, workforce capacity, and AI adoption are developed as related but distinct components rather than treating AI deployment as an isolated technological intervention (UNESCO, 2025).

Similarly, future progress in AI for education leadership and management will require robust national AI strategies that extend beyond classroom applications to include administration and governance, establishing clear standards for ethics, accountability, procurement, and data governance. Research efforts should also focus on examining adoption models, implementation outcomes, institutional readiness, and the impacts of AI on supervision and equity. Furthermore, AI technologies should be designed to be explainable, affordable, low-bandwidth, and mobile-friendly to ensure effectiveness in resource-constrained contexts (Reimers et al., 2025a; Henkel et al., 2024). Therefore, fostering a participatory approach to leadership will be essential to ensure that these technological advancements strengthen human judgment rather than replace it (Reimers et al., 2025a). Future MOE field officers will therefore require a balanced combination of AI literacy, analytical reasoning, ethical competence, leadership, communication, and stakeholder engagement. These competencies position AI as a strategic partner in education management rather than a substitute for professional expertise.

11. Research Gaps

The literature remains scanty on the actual effects of AI on school inspection, supervision, and quality assurance in low- and middle-income settings by MOE field officers. Much of the available work is conceptual, policy-oriented, or based on reviews rather than field evidence. There is also limited research on AI governance, accountability, and competency frameworks for MOE field officers working with AI-enabled systems. More context-specific studies are needed to show what works, for whom, and under what specific conditions. Future research should also examine how AI changes professional roles, decision-making processes, institutional readiness, and human-AI collaboration among MOE field officers operating in resource-constrained environments.

Further, to date, no publicly available MOE reports have statistically quantified AI adoption among the different education officers by administrative levels. Consequently, this review did not consider or establish the extent of AI uptake across headquarters, region, county, and sub-county offices. Therefore, future empirical studies should be undertaken to determine the extent of AI adoption across MOE

headquarters, county, and sub-county offices and generate official statistics thereby providing official statistics to inform policy, planning, and implementation.

12. Implications for Policy and Practice

Policy makers should recognize AI as a transformational component of education governance rather than simply another digital application (Reimers et al., 2025b). In Kenya, emerging models for AI integration into Competency-Based Education emphasize that implementation should be ethical, inclusive, and responsive to local educational contexts (Ondiba & Kiprop, 2025). They should prioritize data privacy, ethical use, human oversight, accountability (Reimers et al., 2025b), and a phased approach in which KEMIS and related digital information systems are strengthened while clearly defined AI applications are progressively developed and evaluated. Institutions must invest in interoperable and equitable infrastructure, while training staff in digital literacy, analytical reasoning, and responsible AI use (UNESCO, 2021; OECD, 2019). Collaboration among government agencies, universities, technology providers, and schools can strengthen implementation (UNESCO, 2021). Above all, AI should be treated as a tool that enhances professional judgement, not one that reduces the need for human leadership, empathy, negotiation, and contextual decision-making (UNESCO, 2021). The central policy objective should therefore be building both human capacities and institutional readiness that enables responsible human–AI collaboration across all levels of education management. More research on this area is required as AI takes root in many spheres of management.

13. Conclusion

This mini-review found that artificial intelligence is increasingly influencing education management through a combination of documented operational applications and a growing body of pilot initiatives, policy proposals, and conceptual developments. While evidence indicates substantial potential for AI-supported reporting, data analysis, monitoring, resource allocation, and decision support, routine ministry-wide implementation—particularly among regional, county and sub-county education field officers in Kenya and similar low-resource settings—remains limited. These developments directly reflect the themes and purpose of the review, which sought to examine the emerging role of AI in education administration, the opportunities it creates, and the readiness required for its responsible uptake. The reviewed literature consistently suggests that AI can improve efficiency, timeliness, planning, supervision, and evidence-based decision-making; however, these advantages are accompanied by serious risks and challenges that cannot be ignored. These include weak digital infrastructure, limited AI literacy, fragmented and poor-quality data, system incompatibility, cybersecurity threats, financial constraints, algorithmic bias, privacy concerns, unclear accountability, and the danger of overreliance on automated outputs at the expense of professional judgment as highlighted by UNESCO (2021); Miao & Holmes (2023),

D’Rozario (2025) and Onia & Elkhder (2026).

The literature reviewed also highlights significant gaps in existing research. Much of the existing work remains conceptual, policy-oriented, or focused on classroom teaching rather than on the practical work of Ministry of Education field officers in supervision, inspection, quality assurance, mentoring, and administrative coordination. There is limited empirical evidence from low-resource and ASAL contexts, and little documented research on AI governance, readiness, adoption levels, and the actual experiences of county and sub-county education officers. In summary, the literature points to a clear need for more context-specific studies that examine what works, for whom, and under what conditions in real education management settings. UNESCO (2021) confirms that AI must be guided by ethics, human oversight, transparency, and accountability, while UNESCO (2023) further warns that technology in education should serve public good rather than deepen inequality. Similarly and Filgueiras (2024) offer important challenges of adopting AI in education administration, especially around governance, bias, transparency, and institutional readiness. Consistent with emerging international policy perspectives, the successful integration of AI into education management depends not only on technological advancement but also on preparing education professionals with the ethical knowledge, governance capacity, and AI literacy required for responsible implementation (Schiff, 2022).

Looking ahead, the future for education field officers in the AI era is one of strengthened professional relevance rather than replacement. Their role will increasingly shift from routine inspection and paperwork and administrative tasks towards strategic leadership, data interpretation, ethical judgment, school support, and human-AI collaboration. AI will likely become a core workplace tool, but its effectiveness will depend on the ability of officers to interpret outputs wisely, verify data quality, engage stakeholders, and make context-sensitive decisions. The future therefore holds a more technologically enabled, responsive, and evidence-driven education management system provided that AI adoption is matched with investment in infrastructure, staff capacity building, interoperable systems, ethical safeguards, and strong policy frameworks. In this way, AI will not replace Ministry of Education field officers; rather, it will expand their capacity to deliver more efficient, equitable, and accountable education management.

14. Limitations

This mini-review has several limitations that should be considered when interpreting its findings. First, the available literature is dominated by conceptual papers, policy documents, theoretical frameworks, and broad studies on AI in educational management, with relatively few empirical investigations specifically examining how MOE field officers use AI in routine supervision, inspection, mentoring, quality assurance, and administrative functions. Consequently, many of the conclusions are based on synthesis and inference rather than extensive field-based evidence. Second, the available studies are heterogeneous in geographical coverage, methodological

design, and educational context. As a result, the certainty of the available evidence remains moderate, and the findings should not be interpreted as representing the level of AI implementation across all education systems or administrative levels. Third, differences in digital infrastructure, institutional readiness, governance frameworks, workforce capacity, and national AI policies may limit the transferability of the findings to other countries or educational contexts. Finally, because publicly available empirical data remains limited, this review was unable to determine or compare the extent of AI adoption among MOE field officers at national, regional, county, and sub-county levels and therefore it cannot be generalized to a wider region or globally. These limitations highlight the need for more robust empirical evidence to strengthen understanding of AI-enabled education management and to validate the emerging concepts identified in this review.

Institutional Disclaimer

The authors alone are responsible for the content of this manuscript. The views and opinions expressed herein are those of the authors in their personal academic capacity and should not be construed as representing the official policy, position, or endorsement of the Ministry of Education, Kenya, or any other affiliated institution.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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