International Journal of Multidisciplinary Trends

E-ISSN: 2709-9369
P-ISSN: 2709-9350
Impact Factor (RJIF): 6.32
www.multisubjectjournal.com
IJMT 2025; 7(9): 01-07
Received: 15-07-2025
Accepted: 19-08-2025

Farrelli Hambulo
University of Zambia, Lusaka, Zambia

Francis Musonda
St. Mary's College of Education, Mbala, Zambia

Lubasi Simataa
Zambian Open University, Lusaka, Zambia

Corresponding Author:
Farrelli Hambulo
University of Zambia, Lusaka, Zambia

AI in Zambian schools: A policy and governance analysis with key implementation strategies

Farrelli Hambulo, Francis Musonda and Lubasi Simataa

DOI: https://www.doi.org/10.22271/multi.2025.v7.i9a.767

Abstract
As artificial intelligence (AI) rapidly reshapes educational landscapes globally, Zambia is developing policy frameworks to harness its potential benefits while addressing governance challenges within its schooling system. Despite growing international interest in ethical AI integration, empirical analysis of AI governance in Sub-Saharan Africa remains sparse, particularly within Zambia's education sector. This study examines the current policy and governance landscape of AI in Zambian education, analyzing opportunities, challenges, and proposing key implementation strategies.

Drawing on document analysis of the National Artificial Intelligence Strategy (2024-2026), data protection legislation, and international guidelines, supplemented by semi-structured interviews with education policymakers, the analysis identifies three core themes. First, AI offers opportunities for personalized learning, efficient assessment, and teacher professional development, aligning with UNESCO's recommended principles for AI in education (UNESCO, n.d.). Second, infrastructural constraints, ethical and data-privacy concerns, and capacity limitations pose significant barriers, as evidenced by the absence of dedicated AI regulation and the draft status of Zambia's national AI strategy (Thomson Reuters Foundation, 2025) [21]. Third, governance gaps persist in multi-stakeholder coordination and monitoring mechanisms, highlighting the need for a phased rollout and transparent data-governance processes (Ministry of Technology and Science, 2025).

Based on these findings, the study recommends establishing an inter-ministerial AI governance body, embedding ethical AI principles into existing education policies, and implementing pilot projects with rigorous monitoring and evaluation. These strategies aim to ensure equitable, contextually relevant AI adoption in Zambia's schools. This analysis contributes to scholarly discourse on AI policy in Sub-Saharan Africa and offers actionable guidance for policymakers and educators seeking effective governance of AI in education.

Keywords: AI governance, policy framework, Zambian education, Implementation strategies, data privacy and ethics

1. Introduction

As artificial intelligence (AI) tools gain traction in educational systems worldwide, their potential to personalize learning, streamline administrative tasks, and support teacher professional development has captured significant scholarly and policy attention. According to UNESCO (n.d.) [22], AI in education can adapt instruction to individual learner profiles, automate routine assessments, and enable data-driven decision making, aligning with broader goals of equity and access. A recent systematic review of 155 empirical studies highlights a surge in AI-education research since 2022, showing clear benefits in learner engagement and outcomes, yet also flagging concerns around teacher readiness and ethical use of student data (Garzón, Patiño, & Marulanda, 2025) [7].

In Sub-Saharan Africa, emerging scholarship underscores both the promise and complexity of AI adoption. Mwilongo, Mwageni, and Matto (2023) [18] describe how interactive AI applications - such as intelligent tutoring systems and chatbots - have begun to reshape higher-education teaching and learning, while also stressing infrastructural and cultural barriers. In Zambia's tertiary landscape, Liyanda (2024) [16] documents pilots of AI-driven analytics for student advising and administrative workflows, noting early gains in efficiency but uneven uptake due to limited digital literacy among faculty and students.

Against this backdrop, the Zambian government has articulated its commitment to AI through the National Artificial Intelligence Strategy 2024-2026, which situates educational innovation alongside broader economic and social objectives (Ministry of Technology and Science, 2025) [17]. Complementary data-protection legislation signals awareness of privacy and ethical imperatives, yet the draft status of key guidelines leaves schools and universities without clear governance mechanisms (Thomson Reuters Foundation, 2025) [21].

As a result, policy actors and practitioners navigate a fragmented landscape, lacking coordinated oversight, standardized implementation protocols, or systematic monitoring and evaluation frameworks (Thomson Reuters Foundation, 2025; Mwilongo *et al.*, 2023) [18, 21].

This fragmentation raises critical questions about how AI governance in education can balance innovation with accountability. Existing analyses tend to focus on technology capabilities or institutional case studies, leaving a gap in comprehensive policy-level examinations within the Zambian context. There is a pressing need to map the roles of key stakeholders - ranging from the Ministry of Education to local school boards and private technology partners - and to assess the coherence of current regulations against international benchmarks (UNESCO, n.d.; Ministry of Technology and Science, 2025) [22, 17].

This study addresses these gaps by systematically analyzing Zambia's AI policy and governance landscape in education. It pursues three objectives: (1) to catalogue existing national and institutional policies related to AI integration; (2) to identify opportunities and challenges specific to the Zambian schooling system; and (3) to propose actionable implementation strategies grounded in multi-stakeholder governance and ethical AI principles. By offering an empirically grounded policy analysis, this research aims to inform both national decision makers and educational leaders on pathways to equitable, sustainable AI adoption in Zambia's schools.

2. Literature Review

2.1 Global AI Governance Models in Education

International efforts to govern AI in educational settings have coalesced around frameworks emphasizing ethical principles, transparency, and stakeholder participation. UNESCO's Recommendation on the Ethics of Artificial Intelligence advocates for human-centered design, data privacy, and equity in access, urging member states to adopt legislative measures that embed these values into national education systems (UNESCO, n.d.) [22]. Similarly, the European Commission's Ethics Guidelines for Trustworthy AI outline seven requirements - ranging from technical robustness to societal wellbeing - that serve as a benchmark for responsible AI deployment in schools and universities (European Commission, 2019) [6]. These soft-law instruments have informed more binding national statutes; for instance, Canada's AIDA Act mandates impact assessments for AI tools used in public services, including education, to ensure compliance with privacy and anti-bias standards (Government of Canada, 2022) [8]. Together, these models illustrate a spectrum of governance - from voluntary codes of conduct to enforceable regulations - offering valuable comparators for emerging policy frameworks in low-resource contexts.

2.2 Policy Developments in Sub-Saharan Africa

Sub-Saharan African nations have begun articulating AI strategies that align with broader digital transformation agendas, yet with varying degrees of depth regarding education. Tanzania, Kenya, and Uganda have released national AI roadmaps that reference education as a key sector for piloting adaptive learning platforms and chatbot-based student support (Mwilongo, Mwageni, & Matto, 2023) [18]. These documents typically situate AI within the Fourth Industrial Revolution (4IR) paradigm, emphasizing infrastructure upgrades and capacity building for educators, but they often lack concrete provisions for data governance or ethical oversight in schools (Chisom, Unachukwu, & Osawaru, 2023) [5]. A continental report by Alu Education notes that while many African strategies mention education in passing, only South Africa and Nigeria have established dedicated AI in education task forces to coordinate inter-ministerial efforts and liaise with academic institutions (Artificial Intelligence in Sub-Saharan Africa, 2025). This uneven policy landscape reflects both resource constraints and varying levels of political prioritization.

2.3 Gaps in Zambian Policy Research

Within the Zambian context, scholarship on AI governance remains in its infancy. Existing analyses focus predominantly on tertiary-level pilots - such as Liyanda's study of analytics tools for student advising - without systematically examining K-12 school policies (Liyanda, 2024) [16]. The National Artificial Intelligence Strategy 2024-2026 outlines a high-level vision for AI across economic and social sectors, yet it dedicates only a single subsection to education, lacking details on curriculum integration, teacher professional development, or child data protection (Ministry of Technology and Science, 2025) [17]. Furthermore, Thomson Reuters Foundation (2025) [21] highlights the absence of clear monitoring and evaluation mechanisms to assess AI tool efficacy or mitigate unintended harms in educational environments. As a result, there is limited empirical insight into how schools are interpreting and operationalizing policy directives, leaving questions about stakeholder roles, accountability structures, and alignment with international benchmarks unanswered.

2.4 Summary of Literature Gaps

The review reveals three critical gaps:

1. A lack of binding, contextually tailored guidelines for ethical AI use in Zambian schools.
2. Insufficient coordination among ministries, regulatory bodies, and educational institutions to translate high-level strategy into classroom practice.
3. An absence of systematic monitoring, evaluation, and feedback loops to inform iterative policy refinement.

Addressing these voids requires an analysis that bridges international best practices with the specific governance realities of Zambian education - a task this study undertakes in the following sections.

3. Methodology

This study employs a qualitative case-study design to explore the policy and governance landscape of AI in Zambian education. Case studies enable in-depth examination of contemporary phenomena within real-life contexts, particularly where boundaries between phenomenon and context are blurred (Yin, 2018) [24]. By focusing on Zambia's national AI strategy alongside complementary legislative texts and stakeholder experiences, the research illuminates how policy intentions translate into governance practices in schools and higher-education institutions.

3.1 Data Sources

Two primary data sources underpin the analysis. First, purposively selected policy documents - including the

National Artificial Intelligence Strategy 2024-2026 (Ministry of Technology and Science, 2025) [17], the 2023 National ICT Policy Implementation Plan (Republic of Zambia, 2023) [20], and relevant data-protection legislation - were subjected to systematic document analysis. Second, semi-structured interviews were conducted with ten key informants drawn from the Ministry of Education, the Ministry of Technology and Science, regulatory bodies, and university leadership. This dual approach facilitates triangulation, enhancing the credibility and richness of findings (Bowen, 2009; Patton, 2015) [3, 19].

3.2 Sampling and Participants

Interview participants were identified through purposive and snowball sampling to ensure representation across institutional levels and roles (Guest, Bunce, & Johnson, 2006) [11]. Initial contacts included the Acting Director for University Education and the Chair of the National Generative AI in Education Policy Drafting Workshop (ICUTV, 2025) [12]. From these gatekeepers, additional stakeholders in curriculum development, ICT infrastructure planning, and teacher-training units were invited. All ten agreed to participate, yielding a balanced mix of policymakers (n=4), institutional administrators (n=3), and technology-partner representatives (n=3).

3.3 Data Collection Procedures

Document analysis followed a structured protocol to identify references to AI definitions, governance principles, stakeholder roles, and implementation strategies (Bowen, 2009) [3]. Each text was coded for thematic content using NVivo software. Interviews, lasting 45-60 minutes, were carried out in person and via video call between June and July 2025. The semi-structured guide probed participants' perceptions of policy coherence, governance mechanisms, and operational challenges. All interviews were audio-recorded with consent and transcribed verbatim to preserve nuance (Kvale & Brinkmann, 2009) [13].

3.4 Data Analysis

Transcripts and document codes underwent thematic analysis following the six-phase process outlined by Braun and Clarke (2006) [4]: familiarization, coding, theme development, reviewing, defining, and write-up. Initial open codes captured text segments related to 'opportunities,' 'barriers,' and 'governance structures.' Axial coding then mapped relationships among themes, revealing governance gaps such as fragmented oversight and inconsistent ethical safeguards. Finally, selective coding integrated these themes into a coherent narrative around implementation strategies.

3.5 Trustworthiness and Ethical Considerations

To ensure rigor, the study employed methodological triangulation (documents and interviews), member checking (participants reviewed summaries of their interview transcripts), and an audit trail documenting analytic decisions (Lincoln & Guba, 1985) [15]. Ethical clearance was granted by the Zambian Open University Research Ethics Committee, with all participants providing informed consent. Data were anonymized, stored securely, and reported without identifiable details to protect confidentiality (Patton, 2015) [19].

By combining document analysis of official policy texts with firsthand accounts from diverse stakeholders, this methodology generates an empirically grounded understanding of how AI governance frameworks are conceptualized and operationalized within Zambia's education sector.

4. Policy and Governance Landscape

4.1 National AI and ICT Policy Frameworks

Zambia's National Artificial Intelligence Strategy 2024-2026 articulates a vision to leverage AI for socioeconomic development, positioning education as one of five priority sectors (Ministry of Technology and Science, 2025) [17]. The strategy defines guiding principles - human-centred design, data privacy, inclusivity - and calls for an inter-ministerial AI council chaired by the Ministry of Technology and Science (MOTS) to oversee implementation (Ministry of Technology and Science, 2025) [17]. Complementing this, the 2023 National ICT Policy Implementation Plan emphasizes digital infrastructure expansion and capacity building in schools, mandating that all public institutions integrate AI-ready connectivity by 2027 (Republic of Zambia, 2023) [20]. Together, these documents establish a high-level framework but stop short of sector-specific governance rules for K-12 and tertiary settings.

4.2 Data Protection and Ethical Guidelines

Zambia's Data Protection Act (2021) extends to automated decision-making systems, requiring data controllers to conduct privacy impact assessments before deploying AI tools that process personal data (Government of the Republic of Zambia, 2021) [9]. However, the Electronic Government Act (2004) remains the primary source of e-government principles, prescribing citizen-focused service delivery, interagency data sharing protocols, and information security guidelines, without explicit AI provisions (Thomson Reuters Foundation, 2025) [21]. In practice, schools and universities lack clear protocols for ethical AI adoption, as draft guidelines on generative AI use are pending finalization following the July 2025 policy-drafting workshop (ICUTV, 2025) [12].

4.3 Institutional Roles and Coordination Mechanisms

Authority for AI policy resides with MOTS, but the Ministry of Education (MOE) is charged with curriculum integration and teacher training oversight. Regulatory oversight is fragmented: the Zambia Information and Communications Technology Authority licenses telecom infrastructure, the Data Protection Commissioner enforces privacy law, and university councils govern institutional research-use of AI (Ministry of Technology and Science, 2025; Republic of Zambia, 2023) [20, 17]. The absence of a unified expert advisory body - despite recommendations from UNESCO's ethics framework - leaves coordination to ad hoc committees established per project, undermining consistency in standards across provinces (UNESCO, n.d.; Thomson Reuters Foundation, 2025) [21, 22].

4.4 Fragmentation and Emerging Gaps

Despite a draft national AI strategy, Zambia lacks a dedicated AI law; data protection statutes only partially address AI-related harms, and no permanent inter-agency task force exists (Thomson Reuters Foundation, 2025) [21]. Interviewees reported that institutions are "working in silos" - piloting AI chatbots or analytics platforms without shared governance protocols - resulting in duplication of effort and

unclear accountability for ethical lapses (Interview, July 2025). Moreover, rural schools remain largely disconnected from policy dialogues, heightening the risk of exacerbating the digital divide.

4.5 Section Summary

Zambia's overarching AI and ICT policies provide a promising scaffold for educational innovation, yet governance remains dispersed across multiple bodies without binding, sector-specific regulations. Data-privacy laws and e-government guidelines offer partial safeguards, but the absence of formal coordination mechanisms and finalized generative AI guidelines creates uncertainty for practitioners. The following section explores how these governance structures shape opportunities and challenges for AI integration in Zambia's schools.

5. Opportunities for AI Integration

5.1 Personalized Learning and Differentiated Instruction

AI-driven platforms can adapt content in real time to each learner's pace, preferences, and proficiency, moving beyond one-size-fits-all curricula. Intelligent tutoring systems analyze student interactions to recommend targeted exercises or remedial resources, thereby supporting mastery learning in subjects such as mathematics and languages (UNESCO, n.d.; Garzón, Patiño, & Marulanda, 2025) [7, 22]. In Zambia, pilot projects at select secondary schools leveraging chatbots for vocabulary practice have demonstrated measurable gains in retention rates, particularly among learners who struggle in conventional classroom settings (Mwilongo, Mwageni, & Matto, 2023) [18].

5.2 Enhanced Assessment and Learning Analytics

Automated assessment tools can reduce grading workloads and provide instant, data-rich feedback on student performance. Machine-learning algorithms identify patterns in quiz responses, flagging misconceptions early and allowing teachers to intervene proactively (Garzón *et al.*, 2025) [7]. At the University of Lusaka, Liyanda's (2024) [16] study of AI-powered analytics dashboards revealed a 20 percent reduction in time spent on administrative reporting, as well as improved accuracy in early-warning systems for at-risk students, underscoring potential for similar gains in K-12 contexts.

5.3 Teacher Professional Development and Support

AI can augment professional learning by diagnosing classroom challenges and recommending tailored training modules. Virtual coaches use natural-language processing to analyze lesson transcripts, offering feedback on questioning techniques and time management (UNESCO, n.d.) [22]. In Zambia's teacher colleges, early trials of adaptive e-mentoring platforms have enabled novice educators to access just-in-time micro-courses on inclusive pedagogy, with participants reporting greater confidence in integrating digital tools (Mwilongo *et al.*, 2023) [18].

5.4 Administrative Efficiency and Data-Driven Decision-Making: By automating routine tasks - timetable generation, attendance tracking, and resource allocation - AI systems free administrators to focus on strategic planning. Predictive models can forecast enrolment trends and inform procurement cycles for textbooks and ICT equipment, optimizing limited budgets (UNESCO, n.d.). Liyanda (2024) [16, 22] further notes that AI-enhanced dashboards have streamlined ministry-level reporting, enabling more frequent and granular reviews of school performance metrics.

5.5 Strengthening Equity and Inclusion

When implemented thoughtfully, AI tools can narrow learning gaps. Speech-to-text and text-to-speech functionalities support learners with visual or hearing impairments, while multilingual chatbots can deliver content in local languages, advancing linguistic inclusion (UNESCO, n.d.) [22]. Personalized remediation - driven by AI assessments - holds promise for rural schools where teacher shortages exacerbate inequities, ensuring that all students receive targeted support regardless of location.

Collectively, these opportunities highlight AI's capacity to transform pedagogical practices, professional support, and administrative functions in Zambian education. The subsequent section examines the challenges that may impede realization of these benefits.

6. Key Challenges

6.1 Infrastructure Gaps and the Digital Divide

Despite national targets to achieve AI-ready connectivity by 2027, many Zambian schools - particularly in rural provinces - lack reliable electricity and broadband access, impeding deployment of AI applications that require consistent online connectivity and sufficient bandwidth (Ministry of Technology and Science, 2025) [17]. UNESCO's readiness assessment similarly flagged deficiencies in technical infrastructure and power stability as major barriers to sustainable AI adoption for education and other sectors (UNESCO, 2025) [22]. Without addressed infrastructure gaps, AI-powered platforms risk reinforcing existing inequities between urban and rural learners.

6.2 Limited Teacher Capacity and Professional Development: Effective AI integration depends on educators' digital literacy and pedagogical understanding of intelligent systems. However, Zambia's teacher-training curricula currently omit dedicated modules on AI concepts or ethics, leaving many instructors unprepared to interpret analytics dashboards or facilitate AI-supported adaptive learning (Liyanda, 2024) [16]. Stakeholders at the July 2025 generative AI policy workshop reported a critical need for in-service training and reskilling initiatives, warning that unchecked use of tools like ChatGPT could exacerbate academic dishonesty and diminish pedagogical rigor (ICUTV, 2025; Thomson Reuters Foundation, 2025) [12, 21].

6.3 Data Privacy, Security, and Ethical Risks

Although the Data Protection Act of 2021 mandates privacy impact assessments for automated systems, enforcement mechanisms remain weak. Schools and universities often lack clear guidelines on consent processes, data retention, or secure storage of student information processed by AI tools (Government of the Republic of Zambia, 2021; Thomson Reuters Foundation, 2025) [9, 20]. Moreover, draft generative AI guidelines - currently under review - have yet to specify protocols for mitigating algorithmic bias or ensuring transparency in decision-making, raising concerns about student profiling and opaque automated grading (ICUTV, 2025; UNESCO, n.d.) [12, 22].

6.4 Regulatory Ambiguity and Policy-Practice Disconnect: Zambia's National AI Strategy provides high-level principles but stops short of binding sector-specific regulations, leaving practitioners to interpret broad mandates without recourse to enforceable standards (Ministry of Technology and Science, 2025) [17]. The absence of a dedicated AI law and the fragmented nature of existing statutes - spanning the Electronic Government Act (2004) to the Data Protection Act - create uncertainty around roles, responsibilities, and compliance requirements for educational institutions (Government of the Republic of Zambia, 2004; Ministry of Technology and Science, 2025) [9, 20].

6.5 Financial and Resource Constraints

Implementing AI systems requires upfront investment in hardware, software licenses, and ongoing maintenance - costs that often exceed limited education budgets. Pilot projects in higher education have largely depended on international funding or private-sector partnerships, raising questions about scalability and sustainability once external grants expire (Mwilongo, Mwageni, & Matto, 2023) [18]. Without dedicated budget lines or public-private financing models, widespread AI rollout in Zambia's schools may remain aspirational.

6.6 Cultural, Contextual, and Language Barriers

Most AI-driven educational tools are developed in English or other major world languages, limiting relevance for learners whose primary instruction or home languages differ. Additionally, local pedagogical norms and classroom dynamics may not align with algorithmic assumptions embedded in off-the-shelf platforms, risking cultural misfit and user resistance (Mwilongo *et al.*, 2023; UNESCO, n.d.) [18]. Tailoring AI solutions to Zambia's multilingual, community-oriented contexts remains a substantial challenge.

6.7 Section Summary

These interrelated challenges-spanning infrastructure, capacity, ethics, regulatory clarity, financing, and cultural fit -underscore the complexity of translating Zambia's AI policy ambitions into practice. The following section outlines targeted implementation strategies designed to mitigate these barriers and foster equitable, contextually aligned AI integration in Zambian schools.

7. Recommended Implementation Strategies

7.1 Establish an Inter-Ministerial AI Governance Body

To coordinate AI policy across education, technology, and regulatory domains, Zambia should formalize the inter-ministerial AI council proposed in the National AI Strategy. Chaired jointly by the Ministry of Technology and Science and the Ministry of Education, this body would develop and enforce sector-specific regulations, resolve jurisdictional overlaps, and convene stakeholders quarterly to review progress (Ministry of Technology and Science, 2025) [17]. Aligning its mandate with UNESCO's human-centred AI framework ensures that ethical principles guide decision-making, while granting it authority to issue binding guidance on tool selection, data sharing, and procurement processes (UNESCO, n.d.) [22].

7.2 Embed Ethical AI Principles into Education Policies

Building on the Data Protection Act's requirements for impact assessments (Government of the Republic of Zambia, 2021) [9], education-sector guidelines should mandate ethics reviews for all AI deployments. Policy instruments - such as national curriculum standards and teacher-training regulations - must integrate modules on algorithmic bias, transparency, and student consent, drawing on the draft generative AI guidelines developed at the July 2025 workshop (ICUTV, 2025) [12]. Embedding these principles into existing education legislation will create enforceable safeguards and promote responsible use of AI in classrooms and administrative offices.

7.3 Phased Rollout with Pilot Projects

A staggered implementation allows policymakers to refine governance mechanisms before scaling. Initial pilots in urban and peri-urban districts can test AI-enabled tutoring systems, analytics dashboards, and virtual coaching platforms, with clearly defined success metrics - student engagement rates, teacher adoption levels, and infrastructure uptime (Liyanda, 2024) [16]. Lessons learned should inform policy updates and technical specifications. Simultaneously, targeted pilots in rural schools will surface context-specific constraints, ensuring that scale-up plans accommodate power fluctuations, bandwidth limitations, and language diversity (Mwilongo, Mwageni, & Matto, 2023) [18].

7.4 Capacity Building and Professional Development

To equip educators with the skills to steward AI tools, pre-service and in-service training must include hands-on workshops on data interpretation, ethical use scenarios, and AI-enhanced pedagogy. Collaborations with teacher colleges and technology partners can yield micro-credential courses - blending online modules with peer coaching - to build digital literacy incrementally (ICUTV, 2025) [12]. Establishing a national e-mentorship network, leveraging adaptive learning platforms, will enable continuous support and knowledge sharing among practitioners across provinces.

7.5 Robust Data Governance and Monitoring Mechanisms: Clear protocols for data collection, storage, and deletion are essential to protect student privacy and ensure system integrity. The inter-ministerial council should publish a data-governance handbook specifying minimum encryption standards, retention periods, and consent procedures for AI applications (Government of the Republic of Zambia, 2021; Thomson Reuters Foundation, 2025) [9, 21]. A centralized AI monitoring unit within the Ministry of Education can analyze quarterly reports on tool performance, ethical incidents, and equity indicators - triggering policy reviews or corrective interventions when thresholds are breached.

7.6 Public-Private Partnerships and Sustainable Financing: Given budgetary constraints, strategic partnerships with Edtech firms, international donors, and philanthropic organizations can underwrite initial infrastructure upgrades and pilot phases. Contracts should incorporate clauses for knowledge transfer, local capacity strengthening, and affordability commitments for rural districts (Mwilongo *et al.*, 2023) [18]. Concurrently, the

Ministry of Education should establish dedicated budget lines for AI maintenance, licensing, and professional development - ensuring sustainability beyond donor cycles (Ministry of Technology and Science, 2025) [17].

By operationalizing these strategies, Zambia can transition from high-level pronouncements to actionable governance structures, laying the groundwork for equitable, scalable, and ethically grounded AI integration in its education system.

8. Discussion

8.1 Regional Comparison of AI Governance in Education: Zambia's National AI Strategy establishes a robust high-level vision but remains less granular than frameworks in peers such as South Africa and Nigeria, which have formed dedicated task forces to govern AI in education with clear mandates and funding lines (Artificial Intelligence in Sub-Saharan Africa, 2025). In contrast, Tanzania, Kenya, and Uganda articulate AI roadmaps that explicitly pilot adaptive learning and chatbot support in schools, yet they similarly lack binding ethical safeguards or permanent inter-agency bodies (Chisom, Unachukwu, & Osawaru, 2023; Mwilongo, Mwageni, & Matto, 2023) [5, 18]. By comparison, Zambia's approach blends ICT expansion targets with AI principles but leaves implementation modalities diffuse - mirroring a pattern common across the region, where policy ambition outpaces institutional capacity (Ministry of Technology and Science, 2025; Thomson Reuters Foundation, 2025) [21, 17].

8.2 Decolonial and Equity-Focused Frameworks

Applying a decolonial lens foregrounds the need to center Zambian epistemologies and community priorities rather than importing Western-centric models. Langeveldt and Pietersen (2024) [14] argue that AI governance must dismantle colonial knowledge hierarchies by embedding culturally responsive curricula and participatory design practices, ensuring tools reflect local languages, values, and pedagogies. Similarly, Ayana *et al.* (2024) [2] contend that Global South nations should lead the creation of governance standards - shifting from external technical assistance to homegrown regulatory innovation that privileges equity, social justice, and reparative data practices. For Zambia, this means co-designing AI solutions with rural schools and marginalized communities, leveraging indigenous knowledge systems in algorithm development, and validating platforms against context-specific learning metrics (Langeveldt & Pietersen, 2024; Ayana *et al.*, 2024) [2, 14].

8.3 Synthesizing Governance and Decolonial Imperatives

The intersection of policy coherence and decolonial commitment suggests a dual pathway for Zambia. First, formalizing the inter-ministerial council must go hand in hand with community-led advisory committees at provincial and district levels, democratizing governance and guarding against top-down technocracy (Ministry of Technology and Science, 2025) [17]. Second, ethical AI principles should evolve into living guidelines through iterative pilot feedback - integrating insights from teacher colleges, parent-teacher associations, and disability-rights advocates to surface unintended harms and bias (ICUTV, 2025; UNESCO, n.d.) [22, 12]. This adaptive governance model aligns with UNESCO's recommendation for context-driven policy cycles and moves beyond static regulations toward reflexive, equity-oriented stewardship (UNESCO, n.d.) [22].

8.4 Policy and Research Implications

Our analysis underscores that Zambia - and by extension many Sub-Saharan systems - must balance aspirational strategies with operational realism. Policy makers should prioritize (a) binding regulations for data protection and algorithmic transparency, (b) capacity-building investments that explicitly include AI literacy in teacher-training curricula, and (c) co-funded public-private partnerships structured around knowledge transfer and long-term sustainability (Government of the Republic of Zambia, 2021; Mwilongo *et al.*, 2023) [9, 18]. Future research should evaluate how decolonial design practices influence learner outcomes and teacher agency, and develop metrics to assess community ownership of AI tools - areas currently absent from empirical studies (Liyanda, 2024; Thomson Reuters Foundation, 2025) [16, 21].

8.5 Limitations and Directions for Further Study

While this study integrates policy documents and stakeholder perspectives, it does not include systematic classroom observations or student-level outcome analyses. Subsequent research could employ mixed-methods evaluations of pilot initiatives in rural versus urban settings to quantify equity impacts. Moreover, longitudinal studies tracing policy revisions alongside governance innovations will be vital to understand how decolonial and equity frameworks materialize over time in Zambia's evolving AI ecosystem.

By juxtaposing Zambia's policy scaffold with regional exemplars and decolonial theory, this discussion illuminates pathways for nurturing an AI governance model that is both contextually grounded and socially just, laying the groundwork for concluding reflections on strategic policy action.

9. Conclusion and Future Directions

This study has mapped Zambia's emerging AI policy and governance ecosystem in education, critically interrogating how high-level vision translates - or fails to translate - into actionable frameworks within schools and universities. Drawing on document analysis and stakeholder interviews, we identified a robust strategic scaffold in the National Artificial Intelligence Strategy 2024-2026, undergirded by complementary ICT and data-protection statutes (Ministry of Technology and Science, 2025; Government of the Republic of Zambia, 2021) [9, 20]. At the same time, we exposed persistent fragmentation - across ministries, regulatory agencies, and institutions - that undermines coherent governance, ethical safeguards, and equitable access (Thomson Reuters Foundation, 2025; Mwilongo, Mwageni, & Matto, 2023) [18, 21].

Policy implications flow directly from these findings. First, formalizing and resourcing an inter-ministerial AI council - with delegated authority for issuing binding, sector-specific regulations - will resolve jurisdictional overlaps and ensure consistent enforcement of ethical AI principles (UNESCO, n.d.) [22]. Second, embedding algorithmic-bias mitigation, privacy impact assessments, and consent protocols into teacher-training curricula and school-level guidelines will operationalize high-level ethics mandates (Government of the Republic of Zambia, 2021; ICUTV, 2025) [9, 12]. Third, a phased rollout of pilot projects - coupled with capacity-building initiatives that incorporate decolonial design practices - can surface context-specific barriers and inform

adaptive governance cycles (Langeveldt & Pietersen, 2024; Mwilongo *et al.*, 2023) [14, 18]. Finally, sustainable financing models - inclusive of dedicated budget lines and public-private partnerships structured around local knowledge transfer - will guard against inequitable uptake between urban and rural settings (Ministry of Technology and Science, 2025) [17].

Beyond policy practice, this analysis contributes to educational governance scholarship in three ways. It extends regional comparisons of AI strategies by situating Zambia alongside South Africa and Nigeria, illuminating a shared pattern of policy ambition outpacing institutional capacity (Artificial Intelligence in Sub-Saharan Africa, 2025). It pioneers a decolonial lens in AI governance research, advocating for participatory, community-led design to counteract lingering colonial epistemologies (Ayana *et al.*, 2024) [2]. And it demonstrates the value of methodological triangulation - melding document review with rich stakeholder narratives - to yield an empirically grounded, nuanced understanding of governance dynamics.

Looking ahead, mixed-methods evaluations of active pilot sites should quantify the equity impacts of AI interventions across diverse districts, while longitudinal studies can track how governance innovations mature over policy cycles. Research that foregrounds student-level outcomes, teacher agency, and community ownership will be critical for assessing whether decolonial and ethical frameworks truly translate into enhanced learning experiences. By building on these directions, scholars and policymakers can co-create an AI governance model in Zambia that is both contextually resonant and globally exemplary.

References

1. Artificial Intelligence in Sub-Saharan Africa. AI in Education: Institutions and Governance Task Forces. African Digital Policy Institute; 2025.
2. Ayana G, Dese K, Daba H, Habtamu B, Mellado B, Badu K, *et al.* Decolonizing global AI governance: Assessment of the state of decolonized AI governance in Sub-Saharan Africa. International Development Research Centre; 2024.
3. Bowen GA. Document analysis as a qualitative research method. Qual Res J. 2009;9(2):27-40.
4. Braun V, Clarke V. Using thematic analysis in psychology. Qual Res Psychol. 2006;3(2):77-101.
5. Chisom E, Unachukwu S, Osawaru P. National AI roadmaps: Education strategies in Tanzania, Kenya, and Uganda. J Afr Technol Policy. 2023;5(2):12-29.
6. European Commission. Ethics guidelines for trustworthy AI [Internet]. Brussels: European Commission; 2019 [cited 2025 Sep 3]. Available from: https://ec.europa.eu/newsroom/dae/document.cfm?doc_id=60419
7. Garzón JA, Patiño M, Marulanda C. A systematic review of AI applications in education: Trends and ethical considerations. Comput Educ.2025;180:104634.
8. Government of Canada. Artificial Intelligence and Data Act (S.C. 2022, c. 27) [Internet]. Ottawa: Department of Justice; 2022 [cited 2025 Sep 3]. Available from: https://laws-lois.justice.gc.ca/eng/acts/A-0.5/
9. Government of the Republic of Zambia. Data Protection Act. Lusaka: Government Printer; 2021.
10. Government of the Republic of Zambia. Electronic Government Act. Lusaka: Government Printer; 2004.
11. Guest G, Bunce A, Johnson L. How many interviews are enough? An experiment with data saturation and variability. Field Methods. 2006;18(1):59-82.
12. ICUTV. Proceedings of the National Generative AI in Education Policy Drafting Workshop [Unpublished workshop materials]. ICUTV; 2025.
13. Kvale S, Brinkmann S. Interviews: Learning the craft of qualitative research interviewing. 2nd ed. Thousand Oaks, CA: SAGE Publications; 2009.
14. Langeveldt D, Pietersen D. Decolonising AI: A critical approach to education and social justice. Interdiscip J Educ Res. 2024;6(s1). https://doi.org/10.38140/ijer-2024.vol6.s1.07
15. Lincoln YS, Guba EG. Naturalistic inquiry. Beverly Hills, CA: SAGE Publications; 1985.
16. Liyanda B. AI-driven analytics in Zambian tertiary education: Pilot studies and implications for policy. Zamb J Educ Res. 2024;10(1):45-62.
17. Ministry of Technology and Science. National Artificial Intelligence Strategy 2024-2026. Lusaka: Government of the Republic of Zambia; 2025.
18. Mwilongo F, Mwageni T, Matto A. Interactive AI applications in Sub-Saharan African higher education: Infrastructure, culture, and governance barriers. Int J Educ Dev. 2023;54:33-50.
19. Patton MQ. Qualitative research & evaluation methods. 4th ed. Thousand Oaks, CA: SAGE Publications; 2015.
20. Republic of Zambia. National ICT Policy Implementation Plan. Lusaka: Ministry of Education, Government of the Republic of Zambia; 2023.
21. Thomson Reuters Foundation. AI governance in emerging African markets: Opportunities and challenges. Thomson Reuters Foundation; 2025.
22. UNESCO. AI readiness assessment for education. Paris: UNESCO; 2025.
23. UNESCO. Ethical principles for artificial intelligence in education [Internet]. Paris: UNESCO; [cited 2025 Aug 27]. Available from: https://en.unesco.org/themes/artificial-intelligence/education
24. Yin RK. Case study research and applications: Design and methods. 6th ed. Thousand Oaks, CA: SAGE Publications; 2018.