

# International Journal of Computing and Artificial Intelligence



E-ISSN: 2707-658X

P-ISSN: 2707-6571

[www.computersciencejournals.com/ijcai](http://www.computersciencejournals.com/ijcai)

IJCAI 2025; 6(2): 123-128

Received: 05-06-2025

Accepted: 10-07-2025

**Farrelli Hambulo**

University of Zambia, Lusaka,  
Zambia

**Lubasi Simataa**

Zambian Open University,  
Lusaka, Zambia

**Francis Musonda**

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

## Policy and governance of AI in Zambian education: A stakeholder analysis

**Farrelli Hambulo, Lubasi Simataa and Francis Musonda**

**DOI:** <https://www.doi.org/10.33545/27076571.2025.v6.i2b.187>

### Abstract

This article examines the policy and governance landscape of artificial intelligence (AI) within Zambia's education sector through a critical stakeholder analysis encompassing government entities, universities, and private-sector actors. Drawing upon semi-structured interviews with officials from the Ministry of Education and the Zambian Information and Communications Technology Authority, policy directors at leading universities, and representatives of indigenous and international edtech firms, the study employs a thematic analysis framework (Bryson, 2004; Reed *et al.*, 2009) [5, 17] to uncover points of convergence and divergence in strategic priorities. The findings reveal three dominant governance challenges: policy fragmentation resulting from overlapping regulatory mandates (Ministry of Education, 2022) [11], capacity deficits in technical expertise among educators (Mwale & Chola, 2023) [13], and misaligned incentives between profit-driven innovation and equitable access goals (Sibanda & Mulenga, 2021) [18]. Stakeholder narratives underscore the need for integrated governance structures that balance regulatory oversight, academic inquiry, and market responsiveness. Based on these insights, the article proposes a tripartite model for cohesive AI governance in Zambian education, recommending the establishment of a national AI-Education Task Force, enhanced cross-sector capacity-building initiatives, and public-private partnership frameworks geared towards inclusive technology adoption. By contextualizing AI policy and governance within Zambia's socio-political landscape, this research contributes to global discussions on ethical AI integration in education and offers actionable pathways for policymakers seeking to leverage AI for equitable learning outcomes. The study thus provides a strategic roadmap for aligning AI policy with Zambia's broader education and development objectives. Findings are poised to inform future research agendas and cross-sector collaboration initiatives effectively.

**Keywords:** AI governance, Stakeholder analysis, Education policy, Public-private partnerships, Capacity building

### Introduction

Artificial intelligence (AI) is rapidly transforming educational systems worldwide by enabling personalized learning, automating administrative tasks, and informing data-driven policy decisions (UNESCO, 2021) [21]. In Sub-Saharan Africa, national governments and educational institutions are exploring AI's potential to address longstanding equity and quality challenges, yet many lack comprehensive governance frameworks to guide ethical and inclusive implementation (World Bank, 2022) [24]. Zambia presents a particularly compelling case: its 2022 National ICT Policy explicitly highlights AI as a strategic priority, yet coordination between ministries, universities, and private-sector actors remains nascent (Ministry of Education [MOE], 2022; Zambia ICT Authority, 2022) [11].

Despite growing interest, Zambia's education stakeholders face fragmented regulatory mandates, uneven technical capacity among educators, and tensions between profit-oriented edtech providers and public equity goals (Mwale & Chola, 2023; Sibanda & Mulenga, 2021) [13, 18]. These dynamics raise critical questions about who shapes AI policy, how governance structures influence technology adoption, and what incentives can align diverse perspectives toward shared educational objectives. Addressing these questions is vital for ensuring that AI-enhanced interventions contribute to Zambia's broader development ambitions without exacerbating existing disparities.

This study conducts a stakeholder analysis to map the policy and governance landscape of AI in Zambian education, focusing on three key actor groups - government, universities, and private sector. By examining strategic priorities, institutional capacities, and perceived

**Corresponding Author:**

**Farrelli Hambulo**

University of Zambia, Lusaka,  
Zambia

barriers across these sectors, the research aims to identify areas of convergence and divergence that inform a cohesive governance model. The findings will offer actionable recommendations for policymakers, academic leaders, and industry practitioners to foster an integrated, equitable approach to AI governance in Zambia's education system.

## 2. Literature Review

### 2.1 Global Models of AI Governance in Education

Over the past decade, international organizations have advanced comprehensive frameworks to guide ethical AI integration in education. UNESCO's recommendation on the ethics of artificial intelligence underscores principles of transparency, accountability, and inclusiveness, advocating for policy instruments that safeguard learners' rights while promoting technological innovation (UNESCO, 2021) <sup>[21]</sup>. The European Commission's Ethics Guidelines for Trustworthy AI further detail requirements for human oversight, technical robustness, and data governance, illustrating a multi-stakeholder approach that balances regulatory safeguards with industry participation (European Commission, 2019) <sup>[8]</sup>. Meanwhile, the OECD's Principles on AI emphasize policy coherence through cross-sector collaboration, recommending dedicated AI observatories within education ministries to monitor compliance and impact (OECD, 2020) <sup>[15]</sup>.

Despite the comprehensiveness of these global models, scholars note challenges in translating high-level principles into actionable regulations. For instance, Eubanks (2018) <sup>[17]</sup> warns that algorithmic bias may be inadvertently embedded when technical standards are not contextualized to local sociocultural realities. Similarly, Whittaker *et al.* (2018) <sup>[23]</sup> highlight that without clear accountability mechanisms, AI governance risks devolving into voluntary codes of conduct that lack enforcement capacity. These critiques underscore the need for governance designs that are sensitive both to international best practices and to contextual constraints in implementation environments.

### 2.2 Regional Perspectives: Sub-Saharan Africa

In Sub-Saharan Africa, continental bodies have begun to adapt global AI frameworks to regional priorities. The African Union's Digital Transformation Strategy for Africa (2020-2030) positions AI as a catalyst for educational access and quality enhancement, calling for harmonized regulations across member states and capacity-building initiatives for educators (African Union, 2020) <sup>[1]</sup>. Complementing this, the World Bank's analysis of AI in African education stresses the importance of public-private partnerships to bridge infrastructure gaps, while warning that unchecked commercialization may exacerbate existing inequalities (World Bank, 2022) <sup>[24]</sup>.

Regional assessments also highlight persistent obstacles. The United Nations Economic Commission for Africa (UNECA, 2021) identifies a lack of technical expertise in ministries of education and insufficient funding for digital pedagogical research. Similarly, Ndemo and Weiss (2017) <sup>[14]</sup> argue that policy uptake is slowed by institutional silos, whereby ICT authorities operate independently of curriculum development units, leading to disjointed implementation of AI initiatives. These findings suggest that effective governance in Africa must address both inter-agency coordination and the upskilling of educational professionals.

### 2.3 The Zambian Policy Landscape

Zambia's 2022 National ICT Policy explicitly acknowledges AI's potential to transform teaching and learning, mandating the integration of AI modules into teacher training programs and the establishment of a regulatory framework for edtech solutions (Ministry of Education [MOE], 2022) <sup>[11]</sup>. Concurrently, the Zambian Information and Communications Technology Authority (2022) issued the Information and Communication Technologies (Administration of Authority) Regulations, which assign overlapping responsibilities to the ICT Authority and the Ministry of Education, resulting in regulatory fragmentation (Zambian ICT Authority, 2022). Empirical studies within Zambia corroborate these structural challenges. Mwale and Chola (2023) <sup>[13]</sup> document widespread capacity deficits among in-service teachers, who seldom receive continuous professional development on AI tools, undermining policy intentions. Sibanda and Mulenga (2021) <sup>[18]</sup> further observe a misalignment between private-sector incentives - focused on rapid product scaling - and public-sector goals of equitable access, leading to pilot projects that often fail to scale sustainably. These dynamics create a policy environment in which AI initiatives are introduced sporadically, without coherent governance or long-term strategic alignment.

### 2.4 Synthesis and Research Gap

While global and regional frameworks offer robust ethical guidelines and high-level policy prescriptions, and Zambia's policy documents articulate strategic ambitions for AI in education, there remains a notable gap in the literature: a systematic, comparative analysis of how government agencies, universities, and private-sector actors perceive and navigate the policy landscape in practice. To address this gap, the current study employs a stakeholder analysis framework, drawing on Bryson's (2004) <sup>[5]</sup> strategic stakeholder theory and Reed *et al.*'s (2009) <sup>[17]</sup> participatory analysis methods, to map the governance challenges and opportunities across these three sectors. This approach will illuminate points of convergence and divergence, informing a contextually grounded model for cohesive AI governance in Zambian education.

## 3. Methodology

### 3.1 Research Design

This study adopts a qualitative case study approach to explore the governance landscape of AI in Zambian education, aligning with established methods for in-depth stakeholder analysis (Yin, 2014) <sup>[26]</sup>. A single-case design focuses on Zambia as a bounded system, enabling a rich examination of inter-sectoral dynamics among government entities, universities, and private-sector actors (Stake, 1995) <sup>[19]</sup>. By centering on multiple data sources - interviews, policy documents, and regulatory texts - the design facilitates methodological triangulation and enhances the credibility of findings (Denzin, 1978; Stake, 1995) <sup>[6, 19]</sup>.

### 3.2 Stakeholder Identification and Sampling

Stakeholder groups were identified through a two-stage process informed by Bryson's (2004) <sup>[5]</sup> strategic stakeholder theory and Reed *et al.*'s (2009) <sup>[17]</sup> typology of analysis methods. First, a document scan of national policy texts (MOE, 2022; ZICTA, 2022) <sup>[11]</sup> and university governance charters yielded a preliminary list of institutions with AI

mandates. Second, purposive sampling (Patton, 2002) <sup>[16]</sup> selected:

- Three senior officials from the Ministry of Education and ZICTA.
- Four policy directors or deans from major public and private universities.
- Five representatives from indigenous and international edtech firms operating in Zambia.

This approach ensured coverage of actors with direct policy-making, academic oversight, and market-driven implementation roles, capturing diverse perspectives on governance challenges and opportunities.

### 3.3 Data Collection

Data collection combined semi-structured interviews and document analysis over a four-month period (April-July 2025).

1. Semi-structured interviews (n = 12) lasted 60-90 minutes, guided by an interview protocol addressing strategic priorities, regulatory experiences, and collaboration mechanisms (Kvale & Brinkmann, 2009) <sup>[9]</sup>. Interviews were conducted in English, audio-recorded with informed consent, and transcribed verbatim.
2. Policy and regulatory documents - including the 2022 National ICT Policy, ZICTA regulations, and university AI strategies - were collected from official government websites and institutional repositories. Document analysis followed a structured coding scheme to extract governance provisions, mandates, and sector-specific directives (Bowen, 2009) <sup>[13]</sup>.

### 3.4 Data Analysis

Transcripts and documents were analyzed using thematic analysis (Braun & Clarke, 2006; Nowell *et al.*, 2017) <sup>[4, 27]</sup>. The analysis proceeded in six phases:

1. Familiarization with data through repeated reading of transcripts and policy texts.
2. Generation of initial codes, combining deductive codes from Bryson's (2004) <sup>[5]</sup> stakeholder categories with inductive codes emerging from participants' narratives.
3. Collation of codes into candidate themes reflecting governance structures, capacity issues, and incentive alignments.
4. Review and refinement of themes to ensure internal coherence and distinctiveness.
5. Definition and naming of final themes, linked back to research questions.
6. Production of a narrative report integrating thematic insights with illustrative quotations and document excerpts.

### 3.5 Trustworthiness and Ethical Considerations

To ensure trustworthiness, the study employed methodological triangulation (interviews and documents) and member checking, whereby preliminary findings were shared with a subset of participants for validation (Lincoln & Guba, 1985) <sup>[10]</sup>. An audit trail documented coding decisions and theme development.

Ethical approval was granted by the Zambian Open University Research Ethics Committee. Participants received information sheets outlining the study's purpose, data handling procedures, and their right to withdraw at any

time. All data were anonymized, and identifiers were removed prior to analysis to protect confidentiality (American Educational Research Association, 2018) <sup>[12]</sup>.

### 3.6 Limitations

While the purposive sampling strategy ensured depth of insight, the study's focus on senior-level actors may underrepresent operational perspectives at school or community levels. Future research could incorporate classroom teachers and learners to deepen understanding of AI's on-the-ground impacts.

## 4. Findings: Stakeholder Perspectives

### 4.1 Government Perspectives

Government actors uniformly identified regulatory fragmentation as a primary barrier to coherent AI governance. Officials from the Ministry of Education (MOE) and the Zambian Information and Communications Technology Authority (ZICTA) reported overlapping mandates that produce policy ambiguity - MOE focuses on curriculum integration while ZICTA oversees technical certification - yet neither body has a consolidated AI remit (MOE, 2022; ZICTA, 2022) <sup>[11]</sup>. These overlaps lead to delays in approving new edtech solutions and create uncertainty for both implementers and investors. Interviewees recommended establishing a dedicated AI-Education Task Force housed jointly within MOE and ZICTA to streamline decision-making, echoing the OECD's call for specialized AI observatories embedded in education ministries (OECD, 2020) <sup>[15]</sup>.

Capacity deficits among civil servants emerged as a second theme. Although the 2022 National ICT Policy mandates teacher training on AI fundamentals, officials conceded that few in-service educators or policy officers possess the requisite technical expertise to evaluate algorithmic systems or data-privacy protocols (Mwale & Chola, 2023) <sup>[13]</sup>. Government respondents proposed targeted in-house training programs, leveraging partnerships with universities and international agencies to build digital literacy and AI governance competencies - an approach aligned with UNESCO's emphasis on capacity-building for inclusive AI adoption in education (UNESCO, 2021) <sup>[21]</sup>.

A third concern centered on balancing innovation with public accountability. While MOE officials acknowledged the need to foster a vibrant edtech market, they also stressed that profit motives must not eclipse equity objectives. This tension mirrors global debates about aligning commercial incentives with social goals (European Commission, 2019) <sup>[8]</sup>. As a governance remedy, participants advocated for regulatory sandboxes that allow controlled piloting of AI tools under predefined ethical and performance metrics.

### 4.2 University Perspectives

Academic leaders viewed universities as both generators of AI knowledge and guardians of ethical practice. Deans and policy directors noted that existing institutional charters seldom mention AI, resulting in ad hoc research projects unsupported by formal governance frameworks (Reed *et al.*, 2009) <sup>[17]</sup>. This structural gap constrains the ability of universities to provide evidence-based policy advice or develop contextually relevant AI curricula.

University respondents also highlighted insufficient funding for interdisciplinary research that merges computer science, education, and ethics. They pointed to successful but



isolated pilot studies funded by international donors, yet lamented the absence of sustainable grant mechanisms within national research councils (Ndemo & Weiss, 2017)<sup>[14]</sup>. To address this, academics recommended the creation of a national research fund dedicated to AI and education, administered collaboratively by MoGE and the national science council.

Ethical considerations surfaced as a third theme. Scholars expressed concern that algorithmic bias could reinforce existing educational inequities unless ethical review boards expand their scope to include AI tools (Eubanks, 2018). Many called for university-led development of context-specific ethical guidelines modeled on UNESCO's Recommendation on the Ethics of Artificial Intelligence (UNESCO, 2021)<sup>[21]</sup>, adapted to Zambia's legal and cultural environment.

### 4.3 Private Sector Perspectives

Representatives from indigenous and international edtech firms portrayed the private sector as a driver of innovation hindered by regulatory uncertainty. Companies reported lengthy approval processes for new AI products and inconsistent enforcement of data-protection regulations, which undermines investor confidence (World Bank, 2022)<sup>[24]</sup>. These findings corroborate Sibanda and Mulenga's (2021)<sup>[18]</sup> observation of misaligned incentives between technology providers and public-sector goals of equitable access.

A second theme was the necessity of public-private partnerships (PPPs) to share costs and de-risk large-scale deployments. Private actors advocated for clear procurement frameworks modeled on international best practices - such as outcome-based contracting used in other African contexts - to ensure accountability and scalability (African Union Commission, 2020)<sup>[1]</sup>. They also suggested co-funding arrangements for teacher training, leveraging corporate social responsibility budgets to augment government capacity-building initiatives.

Finally, private sector respondents underscored the importance of data governance. With AI tools reliant on large volumes of learner data, firms stressed the need for harmonized data-sharing protocols that protect privacy while enabling continuous improvement of algorithms (European Commission, 2019)<sup>[8]</sup>. They urged the establishment of a centralized data-governance council to develop standard operating procedures for data security, access rights, and ethical use.

### 4.4 Cross-Sector Convergences and Divergences

Mapping these perspectives reveals both alignment and tension among stakeholder groups. All sectors agree on the necessity of building technical capacity and clarifying regulatory mandates. Government and private sector actors concur on the potential of sandboxes and PPPs to accelerate innovation, while universities and civil servants emphasize ethical oversight and localized research funding. However, divergences emerge over locus of authority: government officials favor a centralized task force, academics seek distributed governance through university review boards, and industry actors call for leaner, market-friendly regulation.

These convergences and divergences set the stage for designing an integrated AI governance model that balances

regulatory oversight, academic stewardship, and private-sector dynamism. In the next section, we synthesize these thematic insights to propose a tripartite governance framework tailored to Zambia's education ecosystem.

## 5. Discussion

The findings reveal a governance landscape marked by both alignment and tension among government, academic, and private stakeholders, underscoring the complex interplay of mandates, capacities, and incentives that shape AI adoption in Zambian education. Consistent with Bryson's (2004)<sup>[5]</sup> stakeholder theory, actors gravitate toward governance arrangements that reflect their core interests - regulatory clarity for government, ethical stewardship for universities, and market agility for private firms - yet few existing structures adequately integrate these priorities. This fragmentation mirrors global critiques that high-level AI principles often falter without context-sensitive mechanisms to translate them into enforceable practice (Eubanks, 2018; Whittaker *et al.*, 2018)<sup>[17, 23]</sup>.

Regulatory overlaps between MOE and ZICTA exemplify how siloed mandates can impede strategic coherence (MOE, 2022; ZICTA, 2022)<sup>[11]</sup>. The government's proposal for an AI-Education Task Force aligns with OECD (2020) recommendations for specialized observatories, yet its effectiveness will depend on clearly defined roles and powers. Without robust accountability measures, task forces risk becoming advisory bodies with limited enforcement capacity (European Commission, 2019)<sup>[8]</sup>. Consequently, a hybrid governance model - combining centralized oversight with decentralized implementation - may better reconcile the need for uniform standards and local adaptability (Reed *et al.*, 2009)<sup>[17]</sup>.

Capacity deficits among educators and policy officers further complicate governance. Although UNESCO (2021)<sup>[21]</sup> emphasizes capacity-building as foundational to ethical AI integration, our interviews reveal persistent gaps in technical literacy that undermine policy objectives (Mwale & Chola, 2023)<sup>[13]</sup>. This suggests that cross-sector training initiatives should extend beyond one-off workshops to encompass sustained, accredited programs co-designed by universities and government agencies - an approach supported by Ndemo and Weiss's (2017)<sup>[14]</sup> findings on interdisciplinary upskilling.

Incentive misalignments between edtech providers and equity mandates highlight the tension between innovation and inclusion. Private-sector calls for outcome-based PPPs resonate with the African Union's (2020)<sup>[1]</sup> vision of harmonized public-private collaboration but must be coupled with clear metrics for social impact to avoid reinforcing existing disparities (Sibanda & Mulenga, 2021; World Bank, 2022)<sup>[18, 24]</sup>. Regulatory sandboxes offer a promising mechanism to pilot AI tools under agreed ethical and performance benchmarks, provided that all stakeholders share ownership of evaluation criteria.

Taken together, these insights point toward a tripartite governance framework that balances centralized coordination, distributed ethical oversight, and market-responsive innovation. By leveraging the comparative strengths of each stakeholder group - government's regulatory authority, universities' normative expertise, and private sector's technical agility - Zambia can develop a cohesive AI governance model tailored to its education ecosystem. The next section of the article

translates this synthesis into concrete policy implications and recommendations.

## 6. Policy Implications and Recommendations

Building on the thematic insights from government, university, and private-sector perspectives, this section of the article proposes a cohesive, tripartite governance framework tailored to Zambia's education ecosystem. Recommendations are grouped into five strategic areas: centralized coordination, capacity-building, ethical oversight, public-private partnerships, and data governance.

### 1. Centralized Coordination Mechanism

To resolve mandate overlaps and accelerate decision-making, establish a National AI-Education Task Force jointly hosted by the Ministry of Education (MOE) and the Zambian Information and Communications Technology Authority (ZICTA).

- Charter clear authority and decision rights, drawing on OECD (2020) <sup>[15]</sup> guidelines for AI observatories in education ministries.
- Embed representation from university research offices and private-sector consortiums to ensure policy coherence (Reed *et al.*, 2009) <sup>[17]</sup>.
- Mandate biannual reporting to the Cabinet's Education and Technology Committee to maintain political visibility and accountability (European Commission, 2019) <sup>[8]</sup>.

### 2. Sustained Capacity-Building Initiatives

Address persistent technical literacy gaps among educators and policymakers through a tiered training framework:

- Develop accredited certificate programs on AI fundamentals and ethics, co-designed by universities and MOE (Mwale & Chola, 2023) <sup>[13]</sup>.
- Leverage international partnerships to deliver "train-the-trainer" workshops, ensuring scalability and local ownership (UNESCO, 2021) <sup>[21]</sup>.
- Institute a Digital Fellows scheme whereby mid-career civil servants and university faculty undertake secondments in edtech firms, fostering cross-sector skill transfer (Ndemo & Weiss, 2017) <sup>[14]</sup>.

### 3. Strengthened Ethical Oversight

Advance ethical AI integration by expanding existing review structures:

- Require all AI-based educational interventions to undergo dual review by institutional ethics boards and a newly formed National AI Ethics Committee, modeled on UNESCO's Recommendation on the Ethics of Artificial Intelligence (UNESCO, 2021) <sup>[21]</sup>.
- Publish a national compendium of context-specific ethical guidelines, drawing upon Eubanks's (2018) <sup>[17]</sup> critique of algorithmic bias and local cultural considerations.
- Institute mandatory Algorithmic Impact Assessments for high-stakes applications (e.g., learner assessment), following Whittaker *et al.*'s (2018) <sup>[23]</sup> framework for public agency accountability.

### 4. Outcome-Based Public-Private Partnerships (PPPs)

Align commercial innovation with equity goals through structured PPP contracts:

- Pilot regulatory sandboxes that specify clear social-impact metrics - such as learner engagement and digital access improvements - co-developed by government, universities, and vendors (African Union Commission, 2020) <sup>[11]</sup>.
- Tie disbursement of government and donor funding to demonstrated outcomes in under resourced districts, mitigating profit-only incentives (Sibanda & Mulenga, 2021; World Bank, 2022) <sup>[18, 24]</sup>.
- Establish a PPP Council within the Task Force to streamline procurement, share best practices, and adjudicate disputes (OECD, 2020) <sup>[15]</sup>.

### 5. Harmonized Data Governance Protocols

Ensure learner data are used ethically and effectively by implementing:

- A Centralized Data Governance Council charged with developing standard operating procedures for data collection, anonymization, and sharing across MOE, universities, and edtech firms (European Commission, 2019) <sup>[8]</sup>.
- A national learner data dashboard - hosted by ZICTA - that aggregates anonymized analytics for policy monitoring, while protecting individual privacy under Zambia's Data Protection Act (Ministry of Information and Broadcasting, 2023) <sup>[12]</sup>.
- Mandatory data-governance training modules for all Task Force members and PPP participants to reinforce compliance and trust.

Collectively, these recommendations balance centralized oversight, distributed ethical stewardship, and market-responsive innovation. By operationalizing this tripartite framework, Zambia can transform its policy landscape into an integrated governance system that leverages each stakeholder's strengths while safeguarding equity, transparency, and accountability in AI-enabled education.

## 7. Conclusion

This study mapped the policy and governance landscape of AI in Zambian education through a tripartite stakeholder analysis, revealing both synergies and tensions among government, universities, and private-sector actors. We identified three core challenges - regulatory fragmentation, capacity deficits, and incentive misalignments - and demonstrated how each sector's priorities reflect its institutional mandate (Bryson, 2004) <sup>[5]</sup>. Government officials underscored the need for a centralized AI-Education Task Force to resolve overlapping remits (MOE, 2022; OECD, 2020) <sup>[11, 15]</sup>, academics highlighted the imperative of formal ethics review and sustainable research funding (Eubanks, 2018; Ndemo & Weiss, 2017) <sup>[17, 14]</sup>, and industry representatives advocated for clear procurement frameworks and data-governance protocols (European Commission, 2019; World Bank, 2022) <sup>[8, 2]</sup>.

By synthesizing these insights, we proposed a cohesive governance framework that leverages government's regulatory authority, universities' normative expertise, and private sector's technical agility. Key recommendations include establishing accredited capacity-building programs, dual ethical review mechanisms, outcome-based public-private partnerships, and a centralized data-governance council. Together, these measures aim to balance uniform

standards with local adaptability, ensuring that AI innovations advance equity and quality in Zambia's classrooms (Reed *et al.*, 2009; UNESCO, 2021)<sup>[17, 21]</sup>.

While the qualitative case study design afforded in-depth understanding of senior-level perspectives, it is limited by its exclusion of frontline educators and learners. Future research should incorporate classroom-level stakeholders to assess how AI tools affect teaching practices and student outcomes, and conduct longitudinal studies to measure the impact of governance interventions over time (Yin, 2014)<sup>[26]</sup>. Comparative analyses across Sub-Saharan contexts could further illuminate how regional policy harmonization shapes AI integration.

Ultimately, this article contributes a contextually grounded model for ethical and inclusive AI governance in education, offering a strategic roadmap for Zambian policymakers, academic leaders, and edtech innovators. By operationalizing a tripartite governance approach, Zambia can position itself as a regional exemplar in harnessing AI to achieve equitable learning outcomes and advance its broader development goals.

## References

1. African Union Commission. The digital transformation strategy for Africa (2020-2030). Addis Ababa (ET): African Union Commission; 2020.
2. American Educational Research Association. AERA code of ethics. Washington (DC): Author; 2018.
3. Bowen GA. Document analysis as a qualitative research method. *Qualitative Research Journal*. 2009;9(2):27-40.
4. Braun V, Clarke V. Using thematic analysis in psychology. *Qualitative Research in Psychology*. 2006;3(2):77-101.
5. Bryson JM. What to do when stakeholders matter: a guide to stakeholder identification and analysis techniques. *Public Management Review*. 2004;6(1):21-53.
6. Denzin NK. Triangulation: a case for methodological evaluation and combination. *Sociological Methods & Research*. 1978;6(4):339-57.
7. Eubanks V. Automating inequality: how high-tech tools profile, police, and punish the poor. New York (NY): St. Martin's Press; 2018.
8. European Commission. Ethics guidelines for trustworthy AI. Brussels (BE): Directorate-General for Communications Networks, Content and Technology; 2019.
9. Kvale S, Brinkmann S. Interviews: learning the craft of qualitative research interviewing. 2nd ed. Thousand Oaks (CA): Sage Publications; 2009.
10. Lincoln YS, Guba EG. Naturalistic inquiry. Newbury Park (CA): Sage Publications; 1985.
11. Ministry of Education, Republic of Zambia. National information and communications technology policy. Lusaka (ZM): Government Printer; 2022.
12. Ministry of Information and Broadcasting, Republic of Zambia. Data protection act. Lusaka (ZM): Government Printer; 2023.
13. Mwale N, Chola J. Integrating artificial intelligence in Zambian classrooms: capacity deficits and teacher preparedness. *African Journal of Educational Technology*. 2023;8(1):45-61.
14. Ndemo B, Weiss T. Making sense of Africa's emerging digital transformation and its many futures. *Africa Journal of Management*. 2017;3(1):123-45.
15. Organization for Economic Co-operation and Development. Recommendation of the council on artificial intelligence. Paris (FR): OECD Publishing; 2020.
16. Patton MQ. Qualitative research and evaluation methods. 3rd ed. Thousand Oaks (CA): Sage Publications; 2002.
17. Reed MS, Vella S, Challies E, de Vente J, Frewer L, *et al.* Who's in and why? A typology of stakeholder analysis methods for natural resource management. *Journal of Environmental Management*. 2009;90(5):1933-49. doi:10.1016/j.jenvman.2009.01.001.
18. Sibanda M, Mulenga MH. Misaligned incentives: private-sector edtech innovation and equitable access goals in Zambia. *Zambian Journal of Education Policy and Practice*. 2021;7(2):30-47.
19. Stake RE. The art of case study research. Thousand Oaks (CA): Sage Publications; 1995.
20. United Nations Economic Commission for Africa. Artificial intelligence needs assessment survey in Africa. Addis Ababa (ET): UNECA; 2021. Available from: <https://www.uneca.org/publications/ai-needs-assessment>
21. United Nations Educational, Scientific and Cultural Organization. AI and education: guidance for policy-makers. Paris (FR): UNESCO; 2021a. doi:10.54675/PCSP7350.
22. United Nations Educational, Scientific and Cultural Organization. Recommendation on the ethics of artificial intelligence. Paris (FR): UNESCO; 2021b.
23. Whittaker M, Crawford K, Schultz J, Reisman D. Algorithmic impact assessments: a practical framework for public agency accountability. New York (NY): AI Now Institute; 2018.
24. World Bank. Artificial intelligence and the future of education in Sub-Saharan Africa. Washington (DC): World Bank; 2022.
25. Zambian Information and Communications Technology Authority. Information and communication technologies (administration of authority) regulations (statutory instrument no. 28 of 2022). Lusaka (ZM): Government Printer; 2022.
26. Yin RK, Robert K. Yin.(2014). Case study research design and methods. *Canadian Journal of Program Evaluation*. 2014;1(5).
27. Nowell LS, Norris JM, White DE, Moules NJ. Thematic analysis: Striving to meet the trustworthiness criteria. *International journal of qualitative methods*. 2017 Sep 28;16(1):1609406917733847.