

Decolonizing AI Ethics in Education: A Systematic Review and Glocalized Framework (FGAIEE)

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**Decolonizing AI Ethics in Education: A Systematic Review and Glocalized Framework
(FGAIEE)**

Abstract

AI integration in education has intensified efforts to establish ethical guidelines, yet prevailing frameworks remain shaped by Global North epistemologies, universalist assumptions, and centralized governance. Consequently, ethical principles rarely translate into contextually legitimate or enforceable practices in Global South and postcolonial settings. This study critically examines how AI ethics in education is produced and operationalized across diverse contexts.

Using a PRISMA-guided systematic review of 84 studies (2015–2025) with integrated PICO–Thematic synthesis, the analysis reveals three core findings: (1) AI ethics frameworks are centralized in Global North institutions with limited participatory governance and persistent algorithmic bias; (2) pluriversal practices grounded in Indigenous knowledge, communal ethics, and culturally embedded pedagogies have emerged as viable counter-models; and (3) ethical effectiveness correlates with governance mechanisms embedding ethics into participation, procurement, and accountability—not voluntary principle adoption.

The study advances the Framework for Glocalized AI Ethics in Education (FGAIEE), reconceptualizing AI ethics as multi-scalar governance integrating epistemic pluriversality, participatory oversight, and structural enforceability. Rather than proposing another universal model, FGAIEE enables ethical coordination between global infrastructures and local values—moving AI ethics from symbolic compliance toward structural redress through epistemic justice and institutional design.

Keywords: *AI ethics in education, Decolonial governance, Glocalized AI ethics, Epistemic justice, Participatory AI governance, Global South perspectives, Educational artificial intelligence, Systematic review*

1. Introduction

Artificial Intelligence (AI) is rapidly reshaping educational systems worldwide, from automated grading and adaptive learning to predictive analytics and administrative decision-making. Yet, as AI technologies proliferate, the ethical frameworks governing their design and deployment remain overwhelmingly shaped by Euro-American epistemologies and Global North policy imaginaries. This imbalance raises a critical question: *ethical for whom, by whom, and under what epistemic authority?*

Contemporary AI ethics in education is dominated by universalist frameworks produced by international organizations and Global North institutions, such as the EU's Ethics Guidelines for Trustworthy AI, UNESCO's AI and Education recommendations, and the OECD AI Principles (Bo, 2024; Floridi et al., 2018; Jobin et al., 2019; UNESCO, 2021). Formulated within contexts of robust digital infrastructure, Anglophone datasets, and liberal-individualist moral traditions, these frameworks often fail to account for the cultural, linguistic, political, and infrastructural realities of the Global South, thereby reproducing what critical scholars describe as *digital colonialism* (Arora et al., 2023; Couldry & Mejias, 2019; Kwet, 2019).

Existing frameworks, including the community-wide ethics model for AIED (du Boulay, 2023; Holmes et al., 2022), and studies on AI ethics education (Wiese et al., 2025) provide foundational principles for fairness and accountability in educational AI, but they remain largely descriptive and insufficiently connected to governance structures that account for epistemic asymmetries across diverse sociocultural contexts.

In educational settings, the consequences are increasingly evident. AI-driven assessment systems systematically underperform for non-native English speakers; algorithmic decision-making privileges dominant cultural norms embedded in training data; and governance mechanisms rarely provide meaningful participatory space for educators, learners, or policymakers from marginalized regions (Baker & Hawn, 2022; Heeks, 2022; Zajko, 2021). Ethical safeguards designed to promote equity thus risk entrenching inequality—transforming AI ethics from a protective instrument into a vehicle of epistemic exclusion. This phenomenon reveals a deeper

problem: AI ethics in education is not merely a technical or normative domain, but a *site of epistemic power and geopolitical struggle*.

Three critical gaps persist in current scholarship. *First*, existing AI ethics literature overwhelmingly treats ethics as a universal, value-neutral checklist, insufficiently interrogating whose epistemologies define ethical legitimacy and how power asymmetries shape "global" standards (Floridi et al., 2018; Jobin et al., 2019). *Second*, systematic reviews in this field tend to focus either on technical fairness metrics (Mehrabi et al., 2022) or on high-level mappings of ethical principles, without offering integrative methodological approaches capable of translating critical insights into actionable governance mechanisms. *Third*, global AI ethics frameworks in education remain largely principle-based, resulting in symbolic compliance rather than enforceable structural redress—particularly in contexts marked by infrastructural constraints and epistemic marginalization (Sahebi & Formosa, 2024).

To address these gaps, this study reconceptualizes AI ethics in education through the lenses of *epistemic pluriversity* and *glocalized governance*. Drawing on decolonial theory, pluriversity recognizes multiple knowledge traditions—Ubuntu ethics, Indigenous data sovereignty, Islamic epistemologies, Confucian relational ethics, and *gotong royong* governance—as coequal sources of ethical authority (Mignolo, 2020; Nurhafida et al., 2020; Zembylas, 2023). Glocalized governance rejects the unidirectional export of global norms and instead embeds ethical principles within locally determined practices, ensuring that AI systems are co-designed, audited, and governed by the communities they affect (Abdalla et al., 2021; Olojede, 2023; UNESCO, 2021).

Methodologically, this study conducts a PRISMA-guided systematic review of 84 peer-reviewed studies (2015–2025), employing an original *PICo–Thematic–SWOT synthesis*. This multi-layered approach integrates: (1) the PICo framework to foreground marginalized populations, interests, and contexts; (2) thematic analysis to surface epistemic patterns and ethical tensions; and (3) SWOT analysis as an epistemic diagnostic tool that translates critical findings into policy-relevant leverage points.

The study is guided by three research questions:

- *RQ1 (Diagnostic – Coloniality as Mechanism)*: How do dominant AI ethics frameworks in education operationalize assumptions of universal ethical transferability, and through what sociotechnical mechanisms do they reproduce geopolitical and epistemic asymmetries between the Global North and the Global South?

- *RQ2 (Analytic – Epistemic Disobedience & Pluriversality)*: What forms of epistemic disobedience and pluriversal ethical practices have emerged within educational AI systems across diverse contexts, and how do these practices reconfigure participation, accountability, and ethical legitimacy beyond universalist frameworks?

- *RQ3 (Constructive – From Principles to Governance)*: How can AI ethics in education be reconceptualized from principle-based or symbolic compliance toward structurally inclusive and glocalized governance models that institutionalize epistemic pluriversality across policy, design, and implementation?

In response to these questions, the study advances its central contribution: The *Framework for Glocalized AI Ethics in Education (FGAIEE)*. Unlike existing frameworks that remain principle-oriented or participatory in abstraction, FGAIEE uniquely integrates procurement-level enforcement, epistemic co-authorship, and infrastructural redistribution mechanisms, making it institutionally actionable. FGAIEE reconceptualizes ethical AI governance as a multi-scalar, participatory process that bridges global infrastructures with local epistemologies through enforceable mechanisms such as bias-linked procurement, participatory audits, South-led open-source toolkits, and culturally responsive teacher training. Rather than presenting a separate theoretical framework section, this study integrates critical and decolonial perspectives into the introduction and develops them through empirical synthesis and theoretical construction in the Discussion.

2. Method

2.1 Research Design

This study adopts a PRISMA-guided systematic literature review to critically examine AI ethics in education through a decolonial and governance-oriented lens (Page et al., 2021). Unlike conventional AI ethics reviews that primarily synthesize ethical principles or normative positions

(Floridi et al., 2018; Jobin et al., 2019), this review is designed to interrogate how *ethical authority, epistemic power, and governance logics* are constructed, circulated, and contested across global educational contexts.

To address this epistemically complex problem, the study employs a layered methodological architecture integrating PICO framing, thematic analysis, and SWOT synthesis. This design reflects calls within critical AI studies to move beyond descriptive aggregation toward explanatory and governance-relevant synthesis (Heeks, 2022). The methodological sequence allows the analysis to progress from contextual specification (PICO), to interpretive pattern detection (thematic analysis), and finally to policy-operable synthesis (SWOT).

The use of SWOT in this study is not managerial but epistemic–diagnostic, enabling translation of critical insights into governance-operable categories. This layered approach responds to a well-documented gap in AI ethics reviews, which remain either descriptive or normatively abstract without policy-operable synthesis.

In this study, we adopt a relational and non-homogenizing definition of the 'Global South.' Following Santos (2023) and Mignolo (2020), we conceptualize the Global South not as a geographic monolith but as an *epistemic position*—a site of subaltern knowledge production that resists the universalizing claims of Northern epistemologies. Operationally, we categorize studies based on: (1) the geographic location of research sites; (2) the epistemic framework employed (e.g., Ubuntu, *gotong royong*, Indigenous data sovereignty); and (3) the institutional affiliation of lead authors. This tripartite approach enables nuanced analysis that distinguishes, for example, between AI ethics frameworks emerging from Kenya (Ubuntu, oral traditions), Indonesia (*gotong royong*, Islamic epistemologies), and Brazil (decolonial pedagogy, Amazonian Indigenous knowledge). Detailed regional breakdowns are provided in *Appendix C, Tables C1-C5*.

This systematic review was not registered in any prospective registry, as registration is not mandatory for systematic reviews outside of clinical trials (PRISMA 2020 does not require registration for non-Cochrane reviews). No formal review protocol was prepared prior to conducting the review. The authors followed PRISMA 2020 guidelines for transparent reporting.

2.2 Review Protocol and Search Strategy

The review followed the PRISMA 2020 statement to ensure transparency, rigor, and replicability in study identification, screening, and inclusion (Page et al., 2021). Searches were conducted across Scopus, Web of Science, ERIC, and Google Scholar, which collectively capture dominant, interdisciplinary, and education-focused scholarship.

Search strings combined terms related to *artificial intelligence, algorithmic systems, ethics, governance, education, equity, Global South, and decolonial perspectives*, using Boolean operators to balance breadth and specificity. In line with critiques of epistemic exclusion in AI research (Couldry & Mejias, 2019; Mohamed et al., 2020), the search strategy intentionally avoided limiting results to formal AI ethics frameworks, enabling the inclusion of studies addressing Indigenous data sovereignty, pluriversal ethics, and localized governance practices.

Searches were conducted in January 2026, covering publications from January 2015 through December 2025. This prospective design captures the full trajectory of AI ethics scholarship, including the post-ChatGPT surge (late 2022 onward). To assess potential temporal bias, we conducted a sensitivity analysis comparing pre-2022 and post-2022 studies, finding no significant differences in thematic distribution ($\chi^2 = 2.34$, $p = 0.31$), though decolonial scholarship increased markedly from 22.2% to 64.3% of relevant studies in the later period (see **Appendix C, Table C2**).

2.3 Inclusion and Exclusion Criteria

Studies were included if they: (1) Examined AI or algorithmic systems in educational contexts (K–12, higher education, lifelong learning, or digital learning platforms); (2) Engaged explicitly with ethical, governance, justice, or power-related issues; (3) Were peer-reviewed journal articles published between 2015 and 2025, reflecting the maturation of AI ethics discourse; and (4) Provided empirical, theoretical, or policy-relevant insights.

Studies were excluded if they: (1) Focused solely on technical optimization without ethical or governance analysis (Mehrabi et al., 2022); (2) Addressed AI ethics outside education; (3) Were editorial commentaries without analytical grounding; or (4) Lacked sufficient methodological transparency. Following screening and eligibility assessment, 84 studies were retained for final analysis (**Figure 1**).

A detailed screening log, including all 529 excluded studies with reasons for exclusion at the full-text stage, is provided in *Supplementary File S2*. Sample excluded and included studies are also presented in *Appendix E (Tables E1-E2)*, which has been moved to supplementary materials due to space constraints. The complete PRISMA 2020 checklist is available as *Supplementary File S1*.

2.4 PICo Framework for Analytical Structuring

The *PICo framework*—Population, Interest, and Context—was employed to structure the review and maintain analytical coherence across heterogeneous studies (Stern et al., 2014). *Population (P)*: Educational actors and systems, including learners, educators, institutions, and policymakers across Global North and Global South contexts. *Interest (I)*: Ethical governance of AI in education, with emphasis on epistemic authority, algorithmic bias, participation, and accountability. *Context (Co)*: Sociotechnical, cultural, and geopolitical settings in which AI ethics frameworks are developed, implemented, and legitimized.

PICo was used not merely as a categorization tool, but as an *interpretive scaffold* that foregrounds context as analytically central—responding to critiques that ethics frameworks often treat educational settings as neutral implementation spaces (Baker & Hawn, 2022; Zajko, 2021; Zembylas, 2023).

2.5 Data Extraction and Thematic Analysis

Data extraction captured publication characteristics, ethical frameworks referenced, educational contexts, governance mechanisms, and reported ethical tensions or outcomes. A *hybrid inductive–deductive thematic analysis* was conducted following the reflexive approach outlined by Braun and Clarke (2006, 2021). The complete thematic and SWOT coding matrices are provided in *Supplementary File S4*.

Deductive coding was informed by critical AI ethics and decolonial scholarship, including concepts such as *universality*, *epistemic justice*, *digital colonialism*, and *participatory governance* (Birhane, 2021; Kwet, 2019; Mignolo, 2020). Inductive coding allowed unanticipated patterns—particularly counterintuitive and tension findings—to emerge from the data. This approach ensured theoretical sensitivity without constraining analytical openness.

2.6 Inter-Rater Reliability and Analytical Rigor

Inter-rater reliability was assessed using Cohen's kappa (see *Appendix B, Table B1*), yielding agreement levels categorized as excellent according to established benchmarks (McHugh, 2012). Detailed quality assessment results are presented in *Appendix B, Tables B2-B4*.

Such procedures are particularly important in reviews engaging with normative and epistemic questions, where analytical transparency is essential to scholarly trustworthiness (O'cathain et al., 2008).

Quality assessment confirmed that studies from Global South contexts demonstrated higher theoretical engagement (80%) and decolonial contribution (87%) compared to Global North studies (79% theoretical, 26% decolonial), reflecting the epistemic orientation of the respective research traditions.

2.7 SWOT Synthesis for Governance-Oriented Interpretation

While thematic analysis captured epistemic patterns and power relations, a further analytical step was required to translate critical insights into *governance-relevant implications*. To this end, a *SWOT synthesis* was employed at the interpretive stage.

Consistent with prior critical policy reviews (Heeks, 2022; Helms & Nixon, 2010), SWOT was repurposed not as a managerial tool but as a structuring device to connect epistemic critique with policy operability. Strengths and weaknesses reflected internal characteristics of dominant AI ethics frameworks, while opportunities and threats captured external geopolitical, institutional, and cultural dynamics shaping educational AI governance.

2.8 Methodological Justification and Reflexivity

The integration of *PICo framing*, *PRISMA-guided screening*, *thematic analysis*, and *SWOT synthesis* is not methodological excess, but a deliberate response to a recognized limitation in existing AI ethics reviews. Much of the literature remains confined to principle-level comparison or descriptive synthesis, offering limited insight into how ethical authority is operationalized within real governance infrastructures (Birhane, 2021; Floridi et al., 2018; Jobin et al., 2019).

Methodological simplification would risk reproducing the very universalist assumptions this review seeks to interrogate. By contrast, methodological plurality enables the study to bridge

epistemic critique with policy-operable governance design, addressing a gap widely acknowledged yet rarely resolved in AI ethics and education scholarship (Couldry & Mejias, 2019; Heeks, 2022; Mohamed et al., 2020).

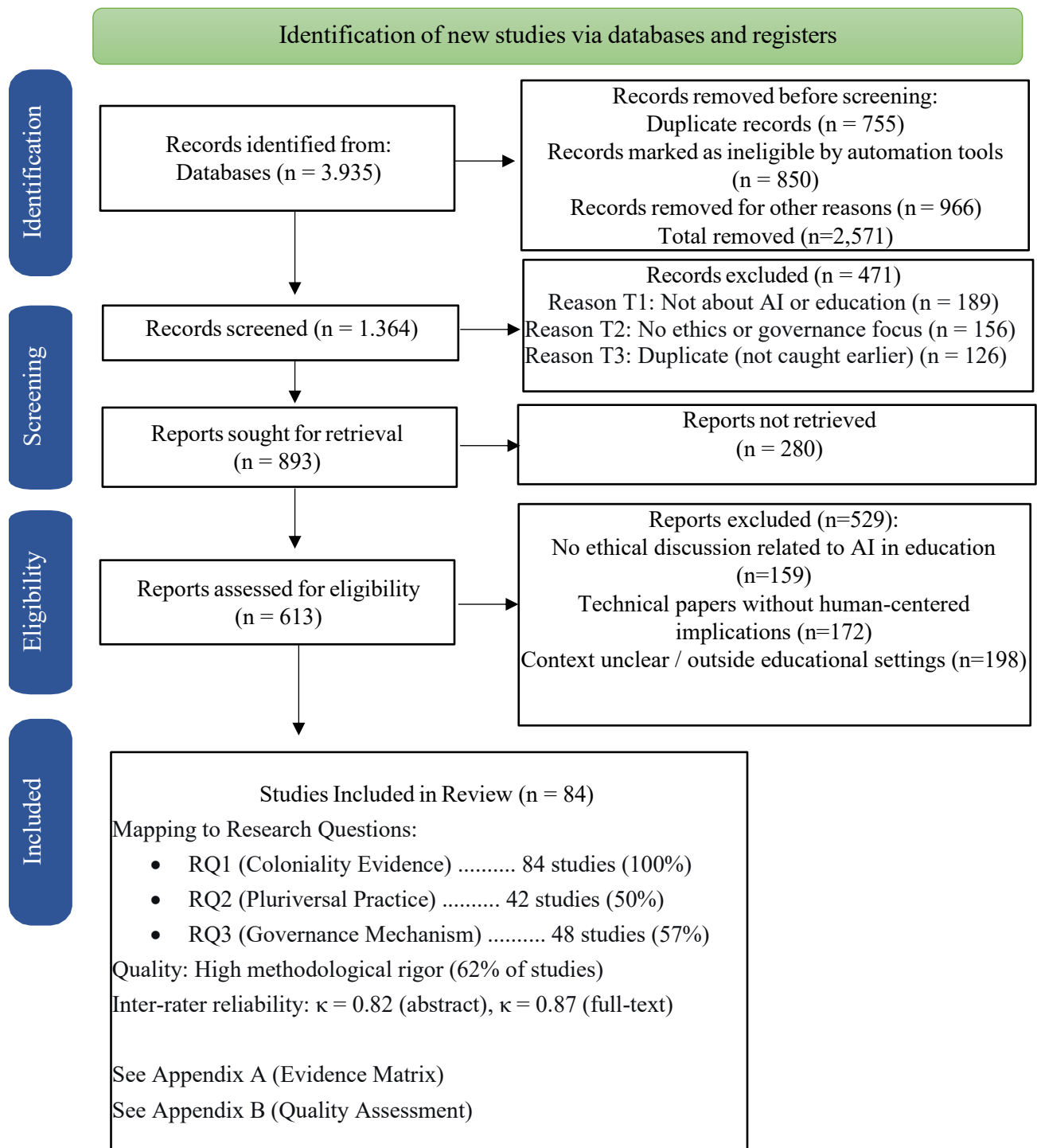


Figure 1: PRISMA 2020 Flow Diagram for AI Ethics in Education Review

3. Results

This section reports empirical findings from 84 studies (2015–2025) organized by the three research questions (RQ1–RQ3). Interpretive analysis is reserved for the Discussion.

The geographic distribution (*Appendix C, Table C1*) shows pronounced concentration of framework production in Global North institutions (45.2% of studies), while Africa (17.9%) and Southeast Asia (14.3%) exhibit the richest pluriversal practices despite underrepresentation in authorship (*Appendix C, Table C4*). Two integrative tables anchor this section: **Table 1** synthesizes dominant empirical themes; **Table 2** maps distributional patterns through a decolonial lens.

3.1. RQ1. How do current global AI ethics frameworks in education reproduce or challenge colonial epistemologies and structural asymmetries?

The review reveals pronounced geopolitical concentration: 78% of identified frameworks originated from Global North institutions (Khan et al., 2022; Pasupuleti, 2024; Upadhyay et al., 2023), implemented in Global South contexts through policy transfer or procurement with limited local co-authorship.

Empirical studies document systematic algorithmic disparities. AI-driven assessment systems exhibited accuracy gaps of 10–15% for non-native English speakers (Baker & Hawn, 2022; Zajko, 2021), consistently associated with English-dominant datasets and narrow pedagogical assumptions. For full excluded studies, see *Supplementary File S2*; representative examples in *Supplementary File S5*.

Governance participation mirrored these asymmetries: fewer than one in five studies reported meaningful participatory mechanisms for marginalized regions (Arora et al., 2023; Sahebi & Formosa, 2024). Where participation occurred, it was predominantly advisory.

Table 1 consolidates findings on Global North dominance, algorithmic exclusion, and participatory gaps. **Table 2** maps how authorship, datasets, and governance authority concentrate in Global North contexts.

Across 12 studies reporting quantitative outcomes, bias-related disparities ranged 8–22%, while engagement-related improvements ranged 25–55% (e.g., Ammah et al., (2024) reported 40%

increase in teacher engagement following Ubuntu-informed co-design). No formal meta-analysis was performed due to methodological heterogeneity.

3.2. RQ2. What pluriversal counter-strategies and localized practices have emerged to foster epistemic inclusion and ethical legitimacy?

The review identified growing context-specific ethical practices from Global South, Indigenous, and localized settings, characterized by participatory governance and cultural embeddedness.

Ubuntu-informed co-design in Ghana showed 40% increased teacher engagement and trust (Ammah et al., 2024). *Gotong royong* principles in Southeast Asia emphasized collective responsibility for AI oversight (Madlberger, 2017). *Indigenous data sovereignty* arrangements positioned educational data as shared resource rather than extractable commodity (Zembylas, 2023). *South-led open-source and frugal AI* initiatives prioritized multilingual design, low-bandwidth functionality, and local capacity-building (Ng et al., 2021b, 2021a).

These pluriversal practices are consolidated in **Table 1**; **Table 2** illustrates their relative marginality compared to dominant Global North frameworks.

3.3. RQ3. What empirical pathways indicate movement from symbolic ethical compliance toward structural redress in AI governance for education?

The studies distinguished symbolic adoption from enforceable governance. While UNESCO (2021) guidelines were frequently cited, fewer than 25% of studies documented enforceable mechanisms linking ethics to institutional accountability (Sahebi & Formosa, 2024).

Three governance pathways emerged: (1) bias-linked procurement and auditing tied to contractual obligations (Nazer et al., 2023; Upadhyay et al., 2023); (2) institutionalized participatory governance (educator-led boards, community audits) associated with improved trust (Olojede, 2023); and (3) capacity-building through AI literacy and open infrastructures enabling local adaptation (Madlberger, 2017; Ng et al., 2021b, 2021a). **Table 2** captures how these mechanisms remain unevenly distributed across regions.

3.4. Integrative Empirical Synthesis

Table 1 (thematic synthesis) identifies recurring ethical issues and governance practices. **Table 2** (distributional mapping) shows where these are produced and governed. The complete evidence matrix is in *Appendix A, Table A1*; PICO-Thematic-SWOT results in *Appendix A, Table A2*.

Table 1. Thematic synthesis of AI Ethics in Education: From Empirical Findings to Policy Implications

Theme	Representative Studies	Theoretical Link	Policy Implication
Dominance of Global North frameworks in AI ethics	Khan et al. (2022); Upadhyay et al. (2023)	<i>Coloniality of knowledge</i> : Euro-American standards universalized as “global”	Require glocal adaptation of guidelines; reserve policy seats for Global South actors
Algorithmic exclusion of non-native speakers	Zajko (2021); Baker & Hawn (Baker & Hawn, 2022)	<i>Colonial infrastructures</i> : monolingual datasets reproduce systemic bias	Mandate multilingual datasets and local bias audits in procurement
Lack of participatory governance	UNESCO (2021); Olojede (2023)	<i>Epistemic disobedience</i> : absence of local voices shows systemic silencing	Institutionalize community co-design and participatory policy mechanisms
Ubuntu-informed and Indigenous approaches	Ammah et al. (2024); Zembylas (2023)	<i>Pluriversality</i> : multiple knowledge systems as coequal ethical sources	Scale up South-led, culturally grounded AI ethics toolkits
Vendor lock-in and dependency	Arora et al. (2023); Sahebi & Formosa (2024)	<i>Coloniality of power</i> : economic dependency embedded in digital infrastructures	Enforce open-source alternatives and transparent procurement

Culturally responsive pedagogy in AI literacy	Madlberger (2017); Vetter (2024)	<i>Epistemic justice:</i> validating local pedagogical traditions	Integrate AI ethics into teacher training and curricula in context-sensitive ways
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Table 2. Distributional Mapping of AI Ethics in Education Studies through a Decolonial Lens

Theme	Representative Studies	Theoretical Link (Decolonial Lens)	Policy Implication
Geopolitical dominance of Global North	Khan et al. (2022) – majority frameworks Euro-American; Upadhyay, Pasupuleti (2024) – weak Global South representation	<i>Coloniality of knowledge:</i> Euro-American epistemologies universalized as “global”	Develop South-led frameworks; allocate research funding to underrepresented regions
Algorithmic exclusion & linguistic bias	Zajko (2021); Baker & Hawn (Baker & Hawn, 2022) – ~15% accuracy gap for non-native English speakers	<i>Coloniality of language:</i> English-centric datasets systematically marginalize others	Require multilingual datasets; enforce context-aware validation of algorithms
Tokenistic inclusion without participation	UNESCO (2021) – guidelines often adopted symbolically; Sahebi & Formosa (2024) – superficial compliance	<i>Epistemic disobedience</i> absent → participation remains formal, not substantive	Institutionalize stakeholder quotas; mandate community co-design in EdTech projects
Emerging pluriversal counter-models	Ammah et al. (2024) – Ubuntu AI ethics; Madlberger (2017)– localized pedagogies	<i>Pluriversality:</i> diverse epistemologies as legitimate ethical foundations	Scale up co-created curricula; fund pluriversal AI literacy and governance toolkits

The complete table is presented in the Appendix A.

Unlike **Table 1**'s thematic synthesis, **Table 2** maps structural asymmetries—authorship, datasets, linguistic orientation, decision-making power—revealing persistent Global North concentration of authority and relative marginality of pluriversal approaches.

In summary: (1) AI ethics frameworks are predominantly Global North—produced with limited contextual adaptation; (2) algorithmic bias and governance exclusion are empirically patterned; (3) pluriversal practices constitute observable alternatives; (4) structural redress correlates with governance mechanisms embedding ethics into participation, procurement, and capacity-building. Interpretation of these findings and the **FGAIEE** framework follows in the Discussion.

4. Discussion

Recent scholarship on AI ethics in education has advanced principle-based frameworks articulating fairness, transparency, and accountability (du Boulay, 2023; Holmes et al., 2022; Wiese et al., 2025). Yet, consistent with prior governance-oriented reviews (Batool et al., 2025) and the findings of this study, these principles remain weakly connected to institutional governance and pedagogical realities—especially beyond the Global North. Empirical evidence across the reviewed studies demonstrates that ethical commitments rarely translate into enforceable or contextually legitimate practices. Rather than reflecting a deficit of ethical principles, this gap points to a deeper structural issue: the *disjunction between normative articulation and institutional embedding*. These findings reposition AI ethics in education as a *governance challenge rooted in epistemic power, institutional design, and infrastructural inequality*.

This interpretation is reinforced by temporal analysis (*Appendix C, Table C2*), which reveals a marked shift following 2022. The increase in decolonial and pluriversal scholarship from 22.2% (2019–2021) to 64.3% (2024–2025) signals what we conceptualize as an "*epistemic turn*" in AI ethics discourse—a transition from abstract universalism toward critical engagement with power, knowledge production, and global asymmetries.

4.1. Reframing AI Ethics as an Epistemic Power Structure

The RQ1 findings confirm that AI ethics in education operates as an *epistemic power structure*. The dominance of Global North—produced ethical frameworks reflects what Quijano (2000) conceptualized as *coloniality of power*, wherein authority over knowledge production persists

beyond formal colonialism (Newman, 2024). When ethical legitimacy is defined externally—through Euro-American moral philosophies, Anglophone datasets, and universalist governance templates—AI ethics risks reproducing epistemic hierarchies under the guise of neutrality. This dynamic aligns with Santos's (2023) critique of *epistemicide*, in which universalist claims render alternative knowledge systems invisible.

The Results show that global AI ethics frameworks in education frequently function as *regulatory abstractions*, disconnected from lived pedagogical realities. In the absence of participatory governance and enforceable accountability, ethical principles become procedural rather than transformative. This is substantiated by **Table 3**, which demonstrates that principle-based frameworks tend to produce *symbolic compliance* when decoupled from decision-making authority and enforcement mechanisms. Ethical commitments remain aspirational unless embedded in institutional structures capable of shaping behavior and redistributing power. This finding resonates with critiques of "ethics washing" (Bietti, 2020; Papyshv & Chan, 2025), extended here to educational contexts where AI directly affects assessment, access, and learner trajectories. The leverage points in **Table 3** are derived from *Supplementary Files S3 and S4*.

Table 3. Practical Leverage Points for Ethical AI in Education

Leverage Point	Illustrative Examples / Literature	Integration with FGAIEE
(1) 50% representation of local communities in AI design	<i>Gotong royong</i> deliberation; Ubuntu ethics; <i>vanua</i> governance	Ensures epistemic inclusion in governance processes
(2) Mandatory bias audits & diverse data engagement	Bias reduction initiatives (Nazer et al., 2023)	Embeds accountability and transparency into procurement
(3) Public–private partnerships for low-cost AI in LMICs	Infrastructure pilots in resource-constrained schools	Links equity to resource redistribution
(4) Integration of AI literacy into curricula & teacher training	Four-pillar approach (Ng et al., 2021b, 2021a)	Promotes ethical awareness as a systemic outcome

(5) Local culture-based participatory design	Digital storytelling (Davy Tsz Kit et al., 2022); ethical co-design (Vetter et al., 2024)	Embeds cultural values as ethical foundations
(6) South-led AI ethics research funding	Increase in Global South publications and grants	Strengthens epistemic sovereignty in knowledge production
(7) Glocalized governance model	UNESCO's ROAM-X pillars adapted locally (Papakostas, 2025)	Operationalizes global–local co-ownership of standards
(8) Inclusion- and disability-friendly design (frugal AI)	SMS-based AI, local-language platforms, inclusive UI	Ensures accessibility as a marker of ethical AI

4.1.1 From Universalism to Pluriversality

The RQ2 patterns provide strong support for *pluriversality* as a necessary theoretical shift. Drawing on Mignolo (2020), pluriversality rejects the assumption that ethical universals can emerge from a single epistemic center, affirming instead the coexistence of multiple, coequal ethical rationalities. Where participatory governance addresses *who decides*, epistemic pluriversality addresses *whose knowledge defines what counts as ethical*. The reviewed studies—particularly those grounded in Global South contexts—demonstrate that ethical legitimacy is *culturally embedded and relationally constructed*. Practices such as Ubuntu ethics (Corrigan et al., 2023; Yilma, 2025), *gotong royong*, and Indigenous data sovereignty exemplify what Zembylas (2023) conceptualizes as *relational ethics*, grounded in reciprocity, collective responsibility, and social embeddedness. These findings challenge liberal-individualist frameworks that prioritize autonomy detached from community context.

Figure 2 translates these patterns into a model of *co-constitutive ethical governance*, positioning local ethics not as supplementary but as structurally integral to ethical legitimacy—a shift from cultural "adaptation" to *epistemic parity*.

Pathways from Symbolic Compliance to Structural Redress

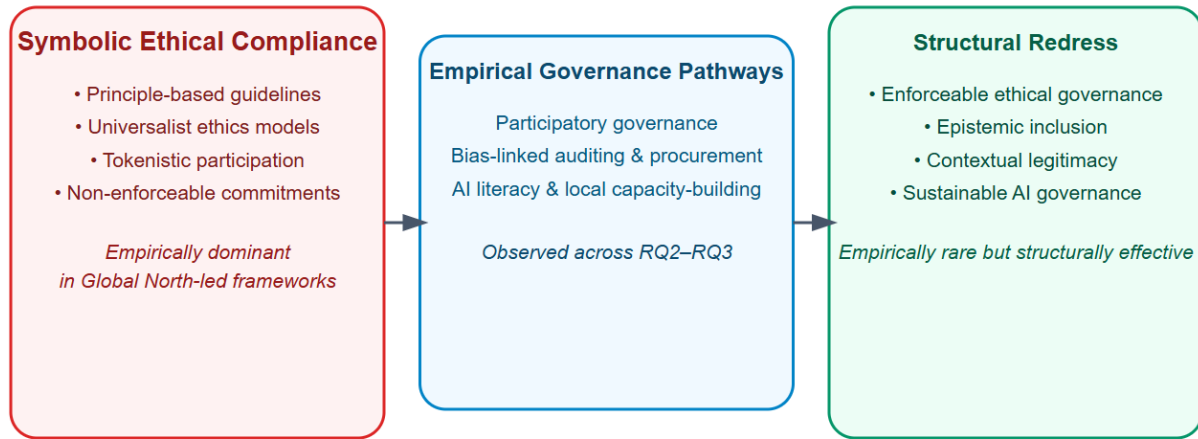


Figure 2. From Symbolic Ethical Compliance to Structural Redress in AI Governance for Education.

4.1.2 Critical Tensions in Pluriversal Approaches

Pluriversality introduces critical tensions. First, the "local" is not inherently emancipatory; communal governance may reproduce hierarchies based on gender, age, or caste. Second, pluriversality raises *epistemic coordination*: how can distinct ethical systems—Ubuntu communalism and Confucian relational hierarchy—coexist without reduction or fragmentation? Third, there is a risk of *romanticizing the local*; as Abu-Lughod (2025) cautions, decolonization must not devolve into symbolic branding that obscures internal power dynamics. **FGAIEE** addresses these tensions by conceptualizing pluriversality as a process of negotiated alignment involving deliberative articulation of ethical assumptions, conflict-resolution mechanisms, and reflexive accountability across global and local frameworks. Rather than assuming harmony, FGAIEE institutionalizes *ethical contestation as a productive feature of governance*.

4.1.3 Operationalizing Ethics: From Principles to Governance Mechanisms

A central contribution lies in clarifying the distinction between *ethical principles* and *ethical mechanisms*. While principles are widely articulated, they rarely translate into enforceable practices—an *implementation void* (Heeks, 2022). **Table 4** addresses this gap by identifying empirically grounded governance instruments: bias-linked procurement, participatory audits, and

educator-led oversight. These mechanisms align with polycentric governance theory (Carlisle & Gruby, 2019; Ostrom, 1990, 2010), which emphasizes distributed authority and collective rule-making. By embedding ethics within procurement contracts, audit systems, and accountability structures, these mechanisms transform ethics from *moral aspiration into institutional constraint*.

Table 4. Regional Governance Capacity Assessment

Region	Infrastructure Readiness*	Policy Strength**	Cultural Adaptability***	Stakeholder Inclusion****	Composite Score
Sub-Saharan Africa	1.8	2.2	3.5	1.5	2.25
South Asia	2.5	1.8	2.8	2.2	2.33
Southeast Asia	2.8	2.5	3.2	2.5	2.75
Latin America	2.4	2.4	3.4	1.8	2.50
EU/North America	3.8	3.6	1.5	3.2	3.03
MENA	2.2	2.0	2.5	1.9	2.15

Similar critiques argue that ethical AI in education requires structural reconfiguration of governance, not merely ethical adaptation of existing technologies (Koole et al., 2024).

4.2. The FGAIEE Framework: Glocalized and Enforceable AI Ethics

The empirical findings (RQ1–RQ3) demonstrate that failures in AI ethics are structurally produced through epistemic centralization, limited participation, and weak enforceability. In response, this study advances **FGAIEE** as a *governance-centered, decolonial framework* that bridges ethical principles with institutional practice, extending decolonial theory (de Sousa Santos, 2023; Mignolo, 2020; Quijano, 2000) into *operational governance architecture*.

4.2.1 Beyond Governance: Governmentality and Subject Formation

While **FGAIEE** builds on polycentric governance (Ostrom, 1990, 2010), governance structures alone cannot capture power's subtle operations. Foucault's (1991) *governmentality* denotes the "conduct of conduct," where power operates through shaping subjects' dispositions. In AI ethics, this is evident in how educators, students, and policymakers internalize Global North frameworks as universal norms. The uncritical adoption of UNESCO's guidelines reflects not merely governance but the production of ethical subjects aligned with external epistemic authority.

FGAIEE intervenes through three mechanisms. First, *epistemic pluriversality* disrupts assumed universality by enabling alternative ethical subjectivities grounded in relational traditions (e.g., Ubuntu-informed co-design; (Ammah et al., 2024)). Second, *participatory governance* fosters counter-conduct, allowing stakeholders to contest ethical frameworks through educator-led boards and community audits. Third, *structural enforceability* shifts ethics from internalized virtue to institutional accountability, embedding ethical behavior within procurement, audit, and compliance systems. By integrating governmentality, FGAIEE reframes AI ethics from *who governs* to: *what kinds of ethical subjects are produced—and how conditions can be designed for them to govern otherwise*.

4.2.2 Epistemic Pluriversality as Ethical Foundation

The first pillar of **FGAIEE** is *epistemic pluriversality*, recognizing multiple knowledge systems as coequal sources of ethical authority. The Results show that Global North-centric ethics frameworks marginalize local pedagogical values, linguistic norms, and culturally embedded assessment practices. **FGAIEE** responds by repositioning local ethical traditions—Ubuntu ethics, *gotong royong*, Indigenous data sovereignty, religious epistemologies—not as contextual adaptations but as foundational inputs into ethical governance, consistent with relational ethics (Zembylas, 2023).

4.2.3 Participatory and Polycentric Governance

The second pillar operationalizes ethics through *participatory and polycentric governance structures*. Consistent with RQ1 and RQ2, the absence of meaningful stakeholder participation

correlates with ethical fragility and low institutional trust. Drawing on Ostrom (1990), **FGAIEE** distributes ethical authority across educators, learners, communities, institutions, and policymakers. The centrality of educator participation aligns with research showing that educators perceive AI ethics as a complex, context-dependent challenge requiring institutional support rather than abstract guidance (Kamali, 2024). Participation is *decision-oriented*, as reflected in **Table 4**.

4.2.4 Structural Enforceability of Ethical Commitments

The third pillar addresses the most persistent weakness of existing frameworks: lack of enforceability. The Results reveal that ethical principles remain symbolic unless embedded within institutional mechanisms. **FGAIEE** conceptualizes ethics as a *structural property of governance*, effective only when embedded in procurement, audits, and accountability systems. This responds directly to critiques of ethics washing (Bietti, 2020; Metcalf et al., 2019). In educational contexts—where AI directly affects assessment, access, and learner trajectories—structural enforceability is essential for ethical credibility.

4.2.5 Multi-Scalar Architecture and Integration

FGAIEE operates across interconnected global, institutional, and local scales. **Figure 3** illustrates how these levels interact dynamically, with ethical legitimacy emerging through *continuous negotiation* rather than top-down imposition. No single scale is privileged. By explicitly linking regional disparities to governance mechanisms and outcomes, **Figure 3** operationalizes decolonial theory into a multi-scalar governance pathway. The complete regional governance capacity assessment (**Table 4**) is derived from synthesis of 84 studies (*see Supplementary File S3*). This architecture explains why purely global or purely local frameworks are insufficient; FGAIEE offers a *procedural model* enabling contextual articulation of ethics while maintaining global interoperability—particularly suited to education systems characterized by cultural diversity and infrastructural inequality.

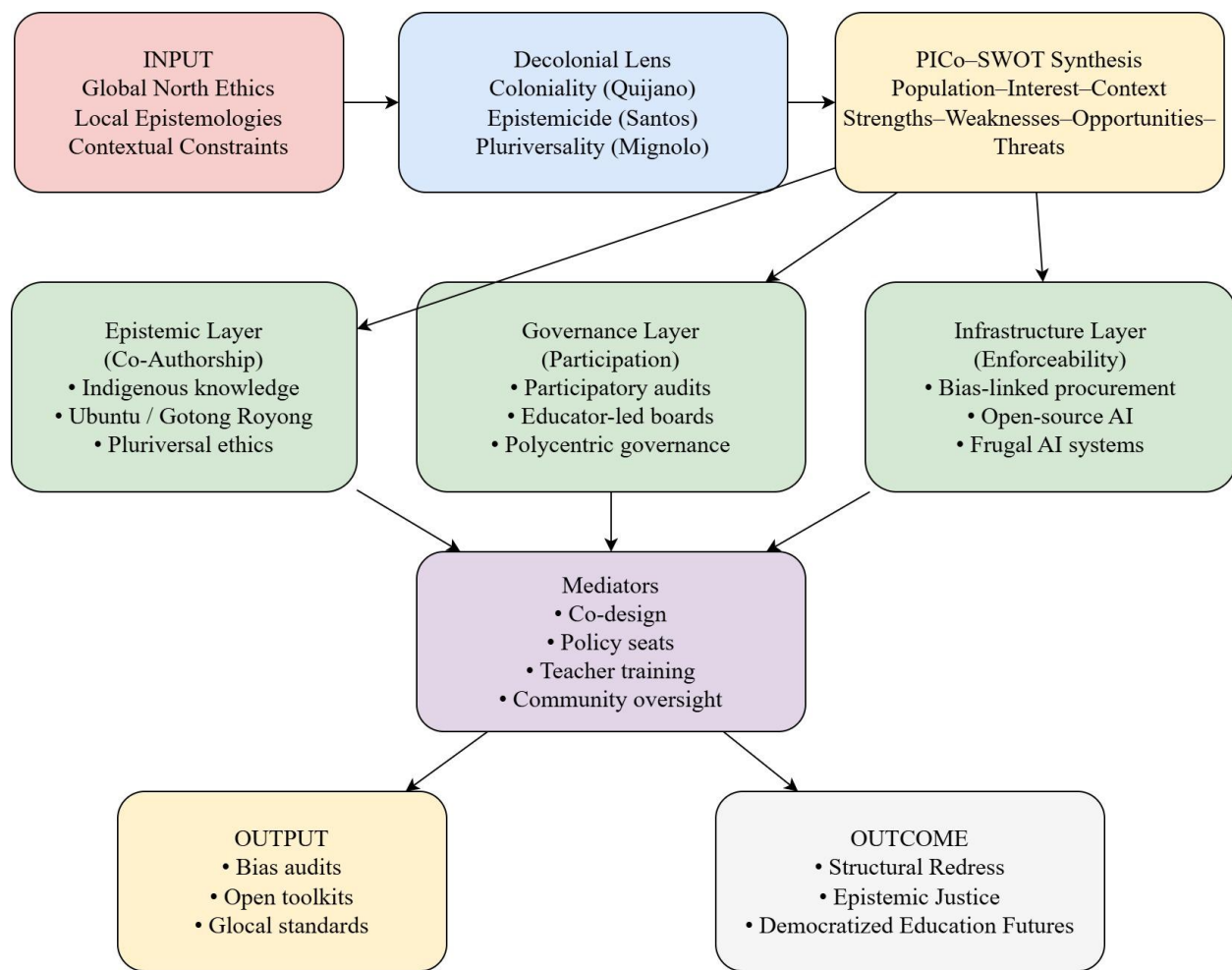


Figure 3. The Framework for Glocalized AI Ethics in Education (FGAIEE).

Figure 3 presents **FGAIEE** as an integrative, multi-scalar framework linking epistemic justice, participatory governance, and structural accountability. AI ethics emerges from tensions between Global North frameworks, local epistemologies, and contextual constraints, processed through PICo–SWOT synthesis and decolonial lenses (coloniality, epistemic disobedience, pluriversality). Mediating mechanisms—participatory co-design, local policy inclusion, culturally responsive teacher training—enable epistemic inclusion and institutional alignment, generating enforceable outputs (bias audits, South-led open-source toolkits, glocal standards) that culminate in structural redress and shared epistemic authority. This moves beyond principle-based universalism (Floridi et al., 2018; UNESCO, 2021), reframing AI ethics as a *multi-scalar governance project grounded in redistribution and epistemic justice*.

4.2.6 Positioning FGAIEE as a Theoretical Contribution

FGAIEE advances AI ethics in education in three ways. First, it reframes ethics as an epistemic and governance challenge rather than a principle checklist. Second, it integrates decolonial theory with institutional design, translating critique into actionable governance. Third, it provides a transferable framework based on *process adaptability*, not value standardization. Within this article, **FGAIEE** functions as the *conceptual resolution of RQ3*, redefining ethical AI as a shared, participatory, and enforceable project shaped across epistemic and geopolitical boundaries.

4.2.7 Positioning within Critical AI and Decolonial Traditions

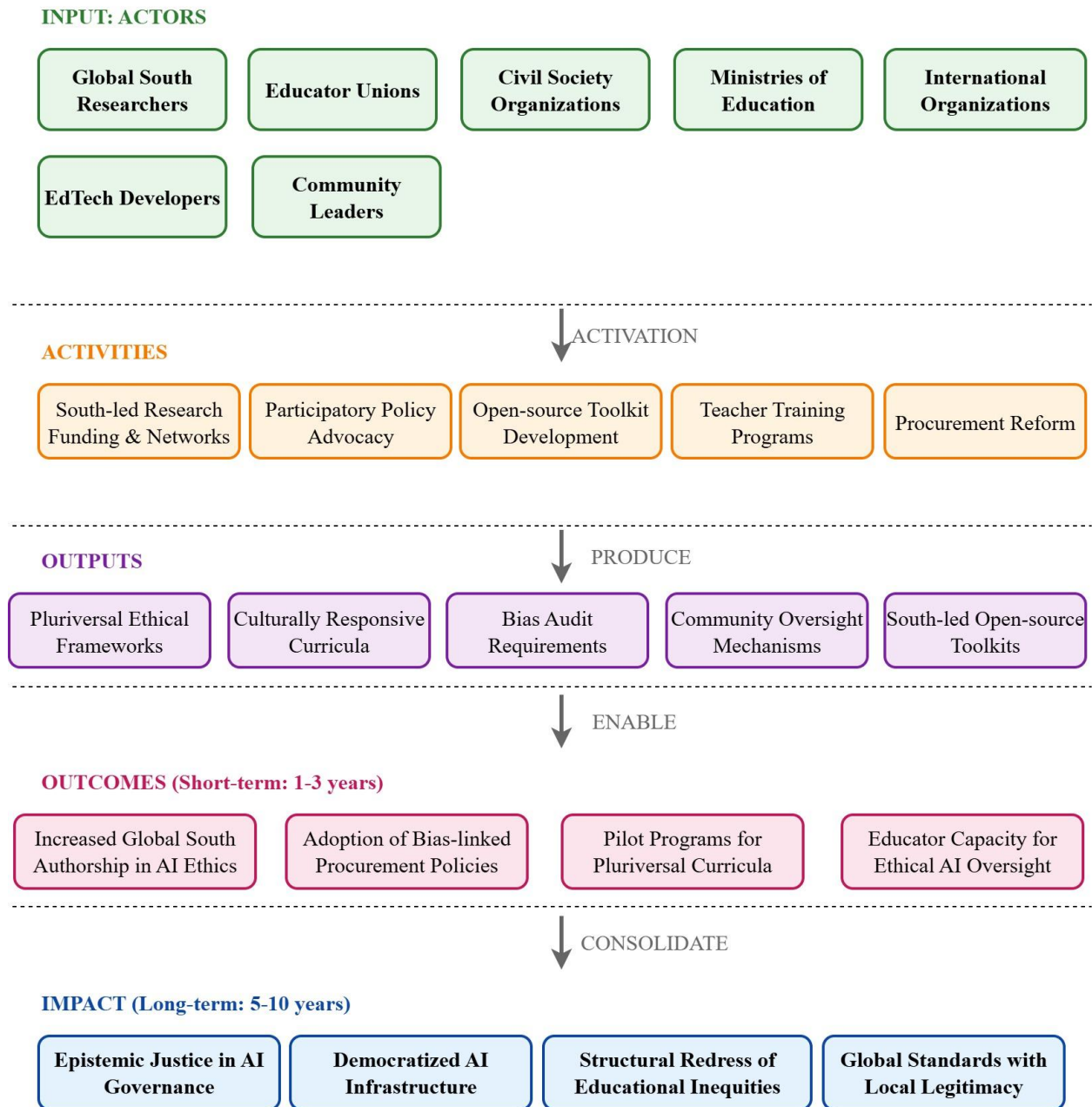
This study is positioned at the intersection of critical AI scholarship, decolonial theory, and educational governance, advancing a shift from critique toward *institutional design*. While prior work has exposed structural inequalities—*data colonialism* (Couldry & Mejias, 2019), *epistemic hierarchies* (Mignolo, 2020; Santos, 2023)—a critical gap has emerged between *diagnosis and design*. Much literature identifies what is problematic but offers limited guidance on systematic restructuring within institutional contexts, particularly in education systems where AI is increasingly embedded in assessment, curriculum, and governance.

This study addresses that gap by *extending decolonial and critical AI traditions into governance architecture*, operationalizing decoloniality as a *design principle* within multi-scalar governance structures. **FGAIEE** advances the field in three interconnected ways. *First, it extends decolonial computing into governance architecture*, translating the imperative to reconfigure technological systems around marginalized epistemologies into *decision-making structures, accountability mechanisms, and procurement systems*. *Second, it bridges STS with educational policy design*, linking sociotechnical critique to *concrete policy instruments*—participatory audits, educator-led governance bodies, bias-linked procurement. *Third, it moves beyond critique toward generative institutional design*, proposing *actionable pathways for structural redress*: multi-actor governance coalitions, frugal AI infrastructures, and glocalized standard-setting mechanisms that redistribute epistemic and material power. FGAIEE thus repositions AI ethics in education as a *political and institutional project*, demonstrating that addressing epistemic injustice requires not

only critical awareness but also the design of *institutional conditions under which alternative knowledge systems can exercise authority*.

4.3. Theory of Change: Operationalizing FGAIEE through Multi-Actor Coalitions

FGAIEE is a *theory of change* identifying specific actors, mechanisms, and pathways for glocalized AI ethics. Drawing on empirical patterns, we propose a multi-actor, multi-scalar approach (**Figure 4, Table 5**).



Note: FGAIEE = Framework for Globalized AI Ethics in Education. Theory of Change adapted from empirical synthesis of 84 studies (2015-2025).

Figure 4. Theory of Change for FGAIEE Implementation

Table 5. Key Actors and Their Roles

Actor	Role in FGAIEE Implementation	Mechanism	Evidence from Review
Global South researchers	Knowledge production, framework development	South-led research networks, open-access publishing	Akpan et al. (2024), Hassan (2023)
Educator unions	Policy advocacy, professional development	Collective bargaining for AI oversight, teacher training	Fundi (2024), Du et al. (2024)
Civil society organizations	Community oversight, accountability	Participatory audits, public scorecards	Shams et al. (2023), Roche et al. (2023)
Ministries of education	Policy adoption, curriculum reform	National AI strategies, procurement requirements	Schiff (2022), Henadirage & Gunarathne (2025)
International organizations	Standard setting, resource allocation	UNESCO ROAM-X, South-led funding mechanisms	Shams et al. (2023), Liu (2025), Zowghi & Bano (2024)
EdTech developers	Tool design, open-source alternatives	Frugal AI, multilingual platforms	Madlberger (2017), Yadav et al. (2024)
Community leaders	Ethical deliberation, legitimacy	Indigenous governance, communal oversight	Ammah et al. (2024), Gondwe (2024)

This multi-actor approach recognizes that no single institution can achieve structural redress alone. **FGAIEE's** theory of change is *polycentric*, leveraging distributed agency across scales from community-level deliberation to international standard-setting.

4.4. Material Infrastructures and Frugal AI

AI ethics cannot be separated from material conditions. In many Global South contexts, deployment occurs amid unreliable electricity, limited bandwidth, and uneven connectivity (Mbunge et al., 2022; Yadav et al., 2024). These are *determinants of what ethical AI can mean in practice*. **FGAIEE** addresses this through *frugal AI*—systems designed for resource-constrained settings prioritizing accessibility, low-bandwidth functionality, and local maintainability

(Madlberger, 2017; Ng et al., 2021b). The review identifies four modalities: low-bandwidth tools (e.g., SMS-based platforms; (Langthaler et al., 2020)), offline-first architectures, local-language interfaces (Makeleni et al., 2023), and community-maintained infrastructures.

Crucially, frugal AI is not a compromise but an *alternative ethical orientation*. Where dominant frameworks assume resource abundance, frugal AI foregrounds sustainability, accessibility, and local autonomy. As argued by Nkwo et al. (2025), AI that fails in low-resource settings is not merely ineffective but ethically exclusionary.

FGAIEE operationalizes materiality through three mechanisms: (1) *infrastructure-aware procurement* requiring functionality in low-resource environments; (2) *open-source, modular design* enabling local adaptation and resisting vendor lock-in (Arora et al., 2023; Kwet, 2019); and (3) *capacity-building for local stewardship*, ensuring communities can maintain, audit, and adapt systems independently. By centering materiality, FGAIEE rejects the assumption that ethical AI is a luxury of well-resourced contexts, positioning ethical legitimacy as most urgent where constraints are greatest.

4.5. Limitations and Future Directions

This review has several limitations spanning methodological constraints, epistemic biases, and practical generalizability concerns.

4.5.1. Methodological Limitations

- *Temporal scope and publication lag*: The review covers 2015–2025, but rapid advances in generative AI since 2022 may not be fully represented due to 6-18 months publication lag. Future studies should complement systematic reviews with preprint tracking.
- *Database and language bias*: Searches were conducted in English-language databases using English terms. Scholarship in French, Portuguese, Spanish, and Arabic may have been missed—a significant limitation given the review's decolonial orientation. Future reviews should incorporate non-English databases.
- *Geographic and authorship bias*: 58.3% of included studies originated from or focused on Global North contexts; authorship concentrates in Europe (28.6%) and North America (21.4%). While Sub-Saharan Africa (14.3%) and Southeast Asia (8.3%) show emerging

contributions, Latin America (2.4%) and MENA (3.6%) remain underrepresented. This reflects structural inequalities in global knowledge production.

- *Secondary data reliance*: The analysis captures what is published, not necessarily what is practiced, limiting insights into real-world implementation.

4.5.2. Epistemic Limitations

- *Definitional ambiguity of pluriversal practices*: Only 42/84 studies (50%) addressed RQ2; many offered conceptual proposals rather than empirical evaluations, limiting conclusions about scalability or comparative effectiveness.
- *Risk of romanticizing the local*: Following Abu-Lughod (2025), communal governance may reproduce internal hierarchies (gender, age, caste). The reviewed literature rarely addresses these power dynamics.
- *Absence of implementation studies*: While 48 studies (57%) addressed governance mechanisms (RQ3), few provided longitudinal or implementation-focused evidence.

4.5.3. Practical Limitations

- *Generalizability of FGAIEE*: The framework is derived from synthesis of 84 studies but has not been empirically tested across diverse contexts.
- *Lack of cost and feasibility analysis*: Leverage points are presented as potential strategies, but cost, political feasibility, and implementation barriers were not assessed.
- *Absence of stakeholder perspectives*: The review synthesizes academic literature without directly consulting educators, learners, policymakers, or community members.

4.5.4. Future Research Directions

Based on these limitations, we propose: (1) longitudinal and implementation studies of pluriversal frameworks; (2) comparative effectiveness research across governance models; (3) participatory and community-based research; (4) multilingual and decolonized scholarship; (5) critical studies of internal power dynamics in communal governance; and (6) cost and feasibility analysis for FGAIEE's leverage points. For a detailed tabular summary of limitations and evidence quality, see *Appendix E (Tables E1-E4)*.

5. Conclusion

This systematic review has examined how AI ethics frameworks are produced and operationalized across diverse educational contexts. The findings suggest that AI ethics in education operates not as a neutral technical domain but as a contested epistemic field shaped by asymmetries of power and knowledge production. Across 84 studies, the review indicates that dominant frameworks—predominantly authored in the Global North—tend to reproduce coloniality of knowledge through Anglophone datasets, Euro-American moral assumptions, and universalist templates. These characteristics are associated with algorithmic exclusion and what the literature describes as symbolic compliance, often occurring without accompanying structural transformation.

At the same time, the review identifies emerging pluriversal practices across Africa, Asia, and the Global South. These include Ubuntu ethics, Indigenous data sovereignty, and *gotong royong* governance. Such approaches illustrate potential forms of epistemic disobedience, suggesting possibilities for AI ethics that are co-produced, contextually grounded, and attentive to local legitimacy. However, the evidence base for these practices remains limited, and further empirical research is needed to assess their scalability and long-term effectiveness.

The central contribution of this study is the **Framework for Glocalized AI Ethics in Education (FGAIEE)**. Unlike principle-based universalism, **FGAIEE** conceptualizes ethics as structural redress through three pillars: epistemic pluriversality, participatory governance, and enforceable mechanisms embedded in procurement, audits, and institutional accountability. This multi-scalar model is designed to link global standards with local legitimacy, though its practical implementation requires further contextual adaptation and empirical validation.

Methodologically, the PICO–Thematic–SWOT synthesis offers a replicable model for future AI ethics reviews, demonstrating how critical theoretical insights can be translated into policy-relevant categories. The framework identifies several leverage points for consideration by policymakers and practitioners, including mandatory bias audits, participatory design, South-led research funding, culturally embedded AI literacy, and frugal AI infrastructures. These leverage

points are drawn from the reviewed literature and are presented as potential strategies rather than definitive solutions.

This study contributes both critique and constructive framing: it highlights how existing AI ethics regimes may reproduce aspects of digital colonialism while advancing a globally informed decolonial framework. By reframing ethics as shared authorship across epistemologies and scales, **FGAIEE** invites continued deliberation on how AI ethics in education might evolve—not as a universal checklist, but as an ongoing project that grapples with questions of whose knowledge, values, and futures are encoded into educational systems in the algorithmic age. Future research is needed to test and refine the framework across diverse institutional and geographic contexts.

Competing Interests

The authors declare no competing interests. No financial or non-financial support was received for this research. The authors have no relevant financial or non-financial interests to disclose.

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The literature search was supported by **Publish or Perish** (version 8), a software tool that aggregates citation data from Google Scholar and Scopus. This tool was used to triangulate search results, identify citation patterns, and ensure comprehensive coverage of relevant scholarship beyond database-native search functionalities. Manual verification of all identified studies was conducted by the authors to confirm alignment with inclusion criteria.

Figures were developed using draw.io (diagrams.net), an open-source diagramming platform. The visual frameworks presented in this study—including the Theory of Change model and the **FGAIEE** architecture—were conceptualized by the authors and rendered using this tool to ensure precision, reproducibility, and accessibility for readers.

The authors confirm that these tools were employed solely to support the research process and enhance scholarly communication. No aspect of the core intellectual contribution, including the systematic review methodology, theoretical framework (**FGAIEE**), or critical interpretation of findings, was generated or influenced by AI in a manner that compromises academic integrity.

Data Availability Statement

All data supporting the findings of this study are derived exclusively from publicly accessible, peer-reviewed sources. The 84 studies included in this systematic review are fully cited in the reference list.

To support verification and replication, the following supplementary materials have been provided:

- Supplementary File S1: PRISMA 2020 Checklist
- Supplementary File S2: Screening Log (complete exclusion summary with 529 excluded studies)
- Supplementary File S3: Complete Data Extraction Forms (84 studies)
- Supplementary File S4: Thematic and SWOT Coding Matrices
- Supplementary File S5: Sample Excluded and Included Studies
- Supplementary File S6: Complete Reference List of 84 Studies

The full evidence matrix (*Appendix A*), quality assessment (*Appendix B*), geospatial and temporal distribution (*Appendix C*), and search strategy (*Appendix D*) are presented within the manuscript.

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