Exploring Cross-Cultural Perspectives on AI Education: Insights from Teachers in Nigeria and the USA

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Abstract

With artificial intelligence (AI) becoming more present in education globally, it is essential to consider how cultural contexts shape teachers' perspectives, an understanding that supports more inclusive and sustainable learning systems. This study draws on the African philosophy of Ubuntu to frame our cross-cultural investigation of how children conceptualize AI through the lens of their teachers. We conducted semi-structured interviews with twelve middle school teachers in Nigeria and the United States, asking them to interpret AI-themed essays written by students. These teacher reflections revealed differing educational priorities, cultural values, and infrastructural realities: U.S. educators' interpretations centered on personal development and future careers, while Nigerian teachers highlighted students' focus on family, community well-being, and practical societal challenges. Nigerian participants also pointed to the need for improved infrastructure (e.g., electricity, internet), broader AI literacy, and education policies that reflect local needs. Our findings illustrate how culturally grounded worldviews, such as Ubuntu, shape interpretations of AI and its role in society, and suggest that AI education is never culturally neutral. We argue that AI literacy initiatives must be designed not only to teach technical skills but also to support educational sustainability, defined here as inclusive, resilient, and culturally responsive learning systems capable of evolving within diverse contexts. We offer actionable recommendations for the HCI community to co-design AI education tools that foreground collective well-being, foster global digital citizenship, and reduce epistemic exclusion in the development of future technologies.

Introduction

"I Am Because We Are": The African Philosophy of Ubuntu

Artificial intelligence (AI) is rapidly transforming educational systems worldwide. From algorithmic tutors (Frankford et al. 2024) to automated assessment tools (Wang and Fitri bin Haris 2025) and curriculum planning platforms (Sanusi et al. 2024), AI is redefining how learning is designed, delivered, and experienced (Deng and Joshi 2024). This evolution has led to growing calls for AI literacy among children (Long and Magerko 2020a), which is defined as the capacity to understand, engage with, and critically assess AI technologies and their societal implications (Amugongo, Bidwell, and Corrigan 2023). Increasingly, AI literacy is being positioned as essential for preparing students to navigate an automated, data-driven future (Nithithanatchinnapat et al. 2024). However, current approaches to AI education often reflect Western-centric norms and assumptions (Adejoro et al. 2023). These approaches tend to minimize or overlook the diverse cultural contexts, infrastructural limitations, and educational values that shape learning experiences in the Global South. As a result, global efforts to promote AI literacy risk reproducing existing inequities, privileging already well-resourced regions while marginalizing voices from communities where digital access, pedagogical goals, and cultural perspectives may differ significantly.

To address these imbalances, we argue that AI education must be reframed not only as a technical or cognitive endeavor but also as a sociocultural and sustainability-oriented challenge. In other words, AI education must support educational sustainability, which we refer to as the development of resilient, inclusive, and contextually grounded learning systems that equip all students, not just those in high-resource contexts, to meaningfully shape and critique the technologies that increasingly govern their lives (Bosch et al. 2025). This perspective urges educators and researchers to recognize that AI literacy is deeply entangled with questions of power, access, cultural meaning, and long-term societal well-being. We grounded this vision in part in the African philosophy of Ubuntu, which centers relational, mutual care, and community-based knowledge making, reminding us that sustainability is inseparable from collective well-being. Commonly summarized as '*I am because we are,*' Ubuntu provides an alternative worldview that challenges the individualistic assumptions embedded in many educational systems, particularly those designed for Western learners (Amugongo, Bidwell, and Corrigan 2023; Farao, Mthoko, and Densmore 2024). From an Ubuntu perspective, knowledge is co-constructed, ethics are grounded in shared flourishing, and learning is inseparable from social responsibility. Using this lens, we examine how teachers in Nigeria and the United States interpret children's conceptualizations of AI, and how their insights can guide the development of AI literacy curricula that are culturally responsive, socially embedded and sustainable. Our study was guided by the fol-

lowing research questions:

- **RQ1:** How do children from underserved contexts interpret AI?
- **RQ2:** What perspectives do teachers have about how children perceive AI?
- **RQ3:** What opportunities and challenges do teachers anticipate when incorporating children's perspectives into the development of AI education?

Using thematic analysis (Braun and Clarke 2006), we found Nigerian teachers emphasized collective priorities, such as agriculture, public health, and access to education, while U.S. teachers focused on personal development, career readiness, and individual creativity. Both valued children's insights, but distinct pedagogical and infrastructural needs emerged from this work. These differences reflect cultural worldviews, educational priorities, and policy constraints-not merely geography or economics. Accordingly, globally relevant AI education demands rethinking what counts as AI knowledge, who defines it, and how it is taught, alongside enabling conditions (teacher training, community involvement, policy alignment, and infrastructure).

Our contributions are threefold:

- **Empirical**: A cross-cultural account of how teachers interpret children's conceptualizations of AI across Nigeria and the U.S., identifying shared themes and context-specific insights.
- **Theoretical**: Ubuntu as a culturally grounded framework for AI education design that challenges individualistic models and centers community-driven, relational approaches.
- **Practical**: Design and policy implications for sustainable, inclusive AI literacy that honor local values, address infrastructural challenges, and empower educators.

In doing so, we call for a reimagining of AI education that moves beyond uniform standards and embraces the diversity of global learners, educators, and communities. This reimagining is critical not only for ethical and equitable technology use, but for building sustainable educational ecosystems that can adapt and thrive in an AI-mediated future.

Related Works

In this section, we contextualize our research within the broader field by reviewing relevant studies from the HCI and learning sciences.

Culturally Responsive Education and Relational Theories of Learning

Culturally responsive education (CRE) affirms students' cultures and integrates their experiences and knowledge into teaching, countering deficit models and linking achievement to identity and context (Ladson-Billings 1995; Gay 2018). Culturally sustaining pedagogy extends this by supporting the ongoing evolution of students' cultural and linguistic practices (Paris 2012). In HCI and CS education, CRE is not mere content tailoring; it embeds learning within students' cultural ecosystems, epistemologies, and community values. Mhasakar et al. argue that Indigenous implementations must honor place-based knowledge, local languages, and relational learning, especially with AI (Mhasakar et al. 2025). Likewise, Bodon and colleagues lay emphasis to "practice-linked identities," making CS meaningful when aligned with learners' cultural identities and social practices (e.g., sports, music) (Bodon, Kumar, and Worsley 2025).

Our study extends this conversation by introducing the African philosophy of *Ubuntu*, a relational worldview summarized as "I am because we are." While not traditionally framed within CRE, Ubuntu complements it by offering a non-Western ontological foundation that centers interdependence, mutual care, and the co-construction of knowledge (Letseka et al. 2013; Eze 2016). In this view, education is not solely about individual achievement, but about fostering relationships and collective well-being. These values resonate deeply with the goals of inclusive AI literacy, particularly in under-resourced or postcolonial contexts where Western models of computing may not fully capture local realities.

In this paper, we use Ubuntu as an interpretive framework to analyze how teachers in Nigeria and the U.S. understand and respond to children's conceptions of AI. This lens allows us to identify how relational ethics, community priorities, and culturally situated epistemologies shape perceptions of technology and education. By situating our work within both CRE and Ubuntu, we contribute to emerging research in HCI and computing education that calls for decolonial, identity-supportive, and contextually meaningful approaches to AI literacy.

The Role of Teachers in AI Literacy Education for Children

As AI technologies become more embedded in society, equipping children with AI literacy is essential to prepare them for engagement with these systems. While many AI education initiatives focus on technical skills such as programming and model training, research increasingly highlights the role of teachers in fostering AI literacy through pedagogical strategies, contextual framing, and value-driven discussions (Chau 1990; Pokrivčáková 2019). Teachers act as facilitators who translate complex AI concepts into accessible learning experiences, making AI education more inclusive and relevant (Dahal 2024; Zhang, Lee, and Moore 2024). However, challenges such as limited professional development, unequal access to AI-integrated curricula, and varying levels of AI literacy among educators hinder effective instruction (Han et al. 2024; Candon et al. 2025). Existing research demonstrates the need for teacher training programs that equip educators with the knowledge and resources to teach AI critically, balancing technical concepts with discussions on ethics, fairness, and societal impact (Gibellini, Fabretti, and Schiavo 2023; Long and Magerko 2020b; Han et al. 2024). Additionally, studies highlight the importance of tailored AI education, advocating for approaches that integrate children's perspectives and address socio-economic barriers (Arawjo and Mogos 2021; Hwang et al. 2023; Rajapakse, Ariyarathna, and Selvakan 2024). While prior work

has explored AI literacy from teachers' perspectives, there is limited research on how teachers interpret children's views on AI and whether these perspectives shape classroom instruction. Our study addresses this gap by examining how teachers in Nigeria and the U.S. engage with students' perspectives on AI and exploring how these insights can inform AI literacy education across diverse socio-cultural contexts.

Designing AI Literacy for Children

Designing AI literacy for children requires pedagogically sound, age-appropriate, and culturally grounded methods. Hands-on activities, storytelling, and interactive toolkits help demystify AI and build curiosity and critical thinking (Constantin et al. 2019; Göbl et al. 2023; Schepers, Dreessen, and Zaman 2018). These approaches integrate AI into familiar learning while growing conceptual understanding (Adejoro et al. 2023; Temitayo Sanusi 2021). Beyond skills, current frameworks foreground ethics, fairness, and social impact: Solyst et al. and Nwogu et al. call for culturally and linguistically inclusive designs (Solyst et al. 2023) (Nwogu et al. 2023); similarly, (Iversen, Smith, and Dindler 2017) highlight empowering children to interrogate contemporary issues (Iivari et al. 2024). Existing studies explore cocreation with robots for culturally responsive computing (Li et al. 2023), and shows real-world scenarios deepen learning (Uchidiuno et al. 2019). Accessibility across diverse contexts remains a core challenge. Curricula must address infrastructural gaps and cultural perceptions, especially outside the West (Septiandri et al. 2023; Wood and Moss 2024). Brummelen et al. and Garg et al. critique Western-centric tools that overlook local knowledge and communal learning (Van Brummelen et al. 2023) (Garg and Sengupta 2020). Septiandri et al. and Wood and Scott further note biases in datasets and materials that normalize Western norms (Septiandri et al. 2023) (Wood and Moss 2024). Equitable progress in AI requires methods that elevate non-Western perspectives and diversify resources (Anuyah et al. 2023; Srinivasan and Chander 2021). While many frameworks exist, few center children's voices. Our study addresses this gap by examining how teachers interpret students' views on AI to inform more contextually relevant AI literacy initiatives.

Method

Guided by an interpretive approach and the Ubuntu principle that knowledge is built in connection with others, we worked with teachers as interpretive partners to explore how children's voices shape ideas about AI education. The study was approved by the Institutional Review Board (IRB) of the first author's institution.

Participants and Recruitment

We conducted semi-structured interviews with 12 middle school teachers, with six from Nigeria and six from the United States. We used purposive sampling to prioritize teachers who (1) taught middle school-aged children and (2) specialized in culturally or socially grounded subjects (e.g., languages, social studies, civic education) and/or STEM-aligned subjects (e.g., mathematics, computer science). We then expanded via snowball sampling, especially effective in Nigeria where centralized recruitment directories are limited. Teachers from both countries were recruited across public and private schools. This mix reflects variation in policy contexts, resources, and community expectations that can influence views on AI in the classroom.

ID	Sex	Ethnicity	Base	Years	Subjects Taught
T1	F	Black/African	Nigeria	17	Hausa, Social Studies, Agriculture
T2	F	Black/African American	USA	4	Science, Social Studies, English
T3	M	Black/African	Nigeria	15	English, Civics, Social Studies
T4	M	White/Caucasian	USA	15	Art, Vocational Studies
T5	F	Black/African American	USA	6	Mathematics (Algebra)
T6	M	Black/African	Nigeria	10	English Language
T7	F	Black/African	Nigeria	12	Igbo Language
T8	F	White/Caucasian	USA	11	Math, Computer Science
T9	F	Black/African American	USA	20	Math, Computer Science
T10	F	Black/African	Nigeria	15	Marketing
T11	M	Black/African	Nigeria	10	Mathematics
T12	F	White/Caucasian	USA	16	Spanish

Table 1: Participant Demographics and Teaching Backgrounds

Participants in Nigeria were drawn from urban, relatively well-resourced schools across Lagos, Abuja, Kano, Enugu, and Port Harcourt. Given infrastructural barriers (e.g., inconsistent electricity, limited internet), we prioritized teachers with sufficient digital literacy and connectivity for remote interviews. In the U.S., participants were recruited from schools with established digital infrastructure and experience with educational technology, including introductory AI tools. All participants completed a digital screening form (via email or messenger application) covering years of teaching, subject areas, and familiarity with technologies. (see Table 1).

Study Procedure

Each teacher was asked to review two student essays from a prior study (Adejoro et al. 2023), in which Nigerian and U.S. middle schoolers were invited to imagine the future of AI. These essays emerged from classroom activities facilitated by the research team, where students discussed real-world AI applications in healthcare, agriculture, education, and transportation. The essay-writing prompt was intentionally open-ended to encourage free expression and avoid constraints imposed by competitive or technical formats. All essays were anonymized and stripped of geographic or linguistic markers before being presented to teachers.

During 60-minute semi-structured interviews, we explored how teachers made sense of children's essays and how these reflections connected to their cultural and pedagogical contexts. We asked questions such as: *"What do these children expect from AI?" "What are their concerns about AI?" "How do you interpret their level of understanding and imagination?" "How might these essays inform your own teaching or curriculum design?"*

While we followed a core set of prompts, we allowed interviews to remain open-ended, inviting teachers to reflect freely. All interviews were conducted remotely via Zoom or WhatsApp, recorded with consent, and transcribed for analysis. After each session, the two interviewers held debriefs to capture immediate impressions and emergent themes.

Data Analysis

We analyzed the essays written by children in a prior study (Adejoro et al. 2023) and interview transcripts using thematic analysis (Braun and Clarke 2006). Two researchers independently coded an initial subset of interviews and used that work to draft a shared codebook with clear definitions and examples. After discussing and resolving differences, we iteratively applied and refined the codebook across the full dataset, merging overlapping codes and adding new ones where needed. The remaining transcripts were then coded with regular calibration meetings to check consistency. For the interview transcripts, we paid attention to both convergence and divergence across the two cultural settings, particularly around themes like AI as a societal tool vs. a personal assistant, the role of local values in shaping AI perceptions, and the infrastructural constraints that educators must navigate.

Positionality and Reflexivity

Our research team consists of scholars from computer science, human-computer interaction (HCI), and learning sciences, bringing diverse academic and geographical perspectives to this work. Two authors are Nigerian; the first author's prior teaching in Nigeria informed our questions and interpretations. Although now U.S.-based, we acknowledge how affiliations, training, and cultural lenses shaped inquiry. Throughout, we sought Ubuntu-inspired reciprocity, respect, and relational knowledge-making, treating teachers and students as co-constructors of knowledge.

Findings

We now present our findings for **RQ1**, **RQ2**, and **RQ3**. Our discussion begins with the views of Nigerian children on AI, as expressed in their essays. Subsequently, we delve into the insights gained by our teacher participants from reviewing these essays. Lastly, we outline the barriers teachers identified that could impede the incorporation of these essays into their AI teaching lessons.

Perspectives of AI from Nigerian Children (RQ1)

The essays written by children provided a comprehensive perspective on the future of AI. They discussed the possible influence of AI in multiple areas, examined different types of problems that AI may potentially answer, analyzed its broader societal implications, and voiced a range of emotional reactions toward the technology.

Conceptualizations of AI The children's essays revealed a diverse range of AI conceptualizations. Robots or automated machines were frequently mentioned in their essays (N=9), reflecting a tangible and practical view of AI. Gadgets or drones were another conceptualization (N=1), as they viewed AI as tools to augment daily life. Sensors and warning systems were also conceptualized as AI applications (N=1), with children recognizing the potential for AI to provide critical alerts. Computer programs were recognized as another form of AI (N=1).

Prevalent Problem Characterizations The children's essays covered various issues they hoped AI could solve, mainly focusing on social (N=10), ethical (N=1), and socioeconomic factors (N=1). Many highlighted the potential of AI to reduce physical labor and improve community well-being. For example, one child mentioned the labor-intensive work of bricklaying, while another pointed out the lack of basic amenities in their community. On ethical matters, Nigerian children saw AI as a tool for fairness, aiding in education and preventing intellectual property theft. Economic considerations were also noted, with one essay justifying the high cost of durable automobiles as a long-term benefit.

Domains of Anticipated Transformation Children portrayed AI as transformative across sectors. Environment/agriculture (N=8) led, with AI-powered machines for planting and harvesting. Education (N=4) featured AI for screening student files and strengthening exam integrity. One child highlighted security, proposing AI against financial crimes. Healthcare ideas included emergency response and outbreak detection. Transportation visions included AI-enhanced, indestructible vehicles for safer public infrastructure.

Perspectives of Teachers About Children's Interpretation (RQ2)

Our analysis shows teachers' takeaways were multifaceted and shaped by: 1) technological exposure and engagement, 2) socio-cultural contexts, and 3) students' individual backgrounds. We discuss these findings section.

Differences in Technological Exposure and Engagement Across contexts, teachers were impressed by the intuition of the children that AI can accelerate routine tasks and support complex problem solving. For example, one teacher discussed the problem in the essay she read by explaining how a child recognized and mentioned multiple problems. At the same time, they worried about a "magic-box" misconception-a tendency to treat AI as a shortcut rather than a tool. As one Nigerian teacher put it, students "more or less expect AI to do everything.

> *"They already know about AI.... From what I see, they more or less expect AI to do everything for them. They seem to think AI should take care of all tasks, even basic ones. In their minds, AI is like a shortcut for*

achieving many things they are meant to do themselves...." (T6, M, Nigeria)

This sentiment was echoed by T8 who similarly explained that children expect AI to operate like a magic box that could solve all of their problems and the way they thought about AI operating. T8 shared:

"Children expect AI to streamline manual work, especially in agriculture and to automate tasks like speech-to-text... Yet many views were under-informed, leaning toward a "magic-bullet" view of..." (T8, F, USA)

Participants highlighted regional gaps in classroom AI use: all U.S. teachers (N=6) used AI/tech tools, whereas only two in Nigeria (N=2) did. Non-use was tied to not teaching tech-related subjects (e.g., computer science/IT, mathematics) or school policy restrictions, underscoring disparities in resources and curriculum integration.

Impacts of Socio-cultural Contexts Across interviews, teachers linked the essays to students' lived contexts. A Nigerian teacher noted the friction when generic online content overlooks local realities and cultural ethics, making relevant, trustworthy information harder to find:

"For example, just three students in the smart room, we give them the opportunity to use the tablets. [...] Many of them want to dash quickly to Google to find information and solve their assignments. [...] It would often take a longer or specific querying of the search engine to narrow it down to the locality and what they can identify with. [...] and complain that these materials do not take cognizance of their locality and unique cultural ethics." (T3, M, Nigeria).

Others emphasized how local heritage - especially agriculture-anchors children's aspirations:

"Their thought is to see how they can get a better way of carrying out the farm practices... a human being has to give directive to all the machines" (T11).

The essays thus worked as a cultural mirror by affirming for Nigerian teachers the primacy of local problems and family well-being, and broadening U.S. teachers' sense of "good problems" and where technology matters most.

Enthusiasm and Creativity Toward AI-With a Pedagogical Catch Finally, a prominent theme that emerged from the interviews with teachers was the enthusiasm and creativity Nigerian children exhibit towards AI and technology (N=5), as observed in their essays. Teachers spoke highly of the children's ability to think critically and creatively about practical problems, showcasing an essential aspect of creativity. This blend of imaginative thinking and practical application was further emphasized by a teacher from the USA, who highlighted the expansive and brilliant imagination of the children:

"I think their imagination is brilliant and huge and like Yeah, let's solve these problems. I think their understanding of what AI is capable of right now and what is being used for is limited. [...] But it shows that they have big imaginations and there's a lot of possibilities to what they think AI can solve." (T8, F, USA).

This sentiment resonates with both USA and Nigerian teachers we interviewed, as they observe how the introduction of technology in the classroom influences children's thinking processes.

Opportunities and Challenges Teachers Anticipate (RQ3)

Teachers across Nigeria and the USA expressed strong interest in using insights from Nigerian children's essays to enrich AI-related instruction, particularly to support cultural comparison, critical thinking, and global awareness. For example, T12 (USA) planned to integrate these insights into her Spanish classroom, emphasizing cultural comparison and student curiosity: *"In my classroom, aside from the language, we do talk about how other cultures live... The discussions around AI, or technology in general, could be an eye-opener for them, such as understanding what a typical house in Nigeria looks like."* Similarly, T3 (Nigeria) highlighted opportunities for debates and group projects: *"Using this essay or the issues raised in this, in English for example... we can use it in the form of debate... that was a probing question that took a lot of brainstorming sessions for them to find out why."* Teachers also proposed videos (N=2), group discussions (N=4), cultural activities (N=1), and extracurricular AI clubs (N=1) as integration strategies.

However, teachers noted several barriers to incorporating these insights and to teaching AI more broadly, which we discuss in this section.

Cultural and Community Engagement Challenges Across the interviews, the difficulty of addressing highly diverse cultural and linguistic contexts was consistently brought up. T4 (USA) noted the challenge of inclusivity given the varied concerns raised in children's essays: *"The biggest challenge that I see is that the social problems they're bringing up are so diverse that it's hard to really address this wide set of things... do you try to make it inclusive of more people or do you choose a sort of a problem that you think, oh, I could actually do something about that?"* Nigerian teachers similarly stressed embedding local languages and cultural norms into AI instruction. As T1 explained: *"If we want to teach AI here, we should be able to consider Yoruba, Igbo... It helps the child to understand better, faster."* Taken together, these concerns point to the need for AI curricula that meaningfully reflect students' cultural contexts while remaining manageable for classroom implementation.

Limited Technological Skills and AI Literacy Teachers frequently cited the need for training (N=5) to build foundational AI literacy. T1 reflected on this need directly: *"Before any of this can come, even when the AI resources are introduced, we need trainings."* U.S. teachers echoed a desire for deeper conceptual grounding. T5 explained: *"Honestly, I would need to get myself more well versed in AI and AI community so that I can think about these problems beyond*

just a mathematical standpoint." These perspectives indicate that teachers recognize AI education's potential but feel underprepared without targeted professional development.

Resource and Technology Integration Constraints Many teachers, especially in Nigeria, described insufficient access to basic technological tools. T1 highlighted the need for foundational materials: "We need audio-visuals materials. The right gadgets can make teaching both faster and easier." Access to computers was often restricted to technology-related subjects, limiting broader AI integration. As T7 put it: *"Teachers that only come to class with computers are computer teachers... For me, I'm not coming to the class. I'm just using my table, my lesson plan and my chalk, or my marker."* Even in better-resourced U.S. classrooms, teachers like T2 described ongoing infrastructural needs: *"Materials about it, videos about it... laptops for the students."* Altogether, these accounts highlight how uneven access to equipment and materials shapes the feasibility of AI teaching across contexts.

Bringing Key Stakeholders Onboard Teachers noted that meaningful AI integration depends on policy environments and parental acceptance. Nigerian teachers argued for inclusion in policy development to ensure that classroom realities are considered. As T1 stated: *"The teachers should be involved... we are the ones in the class. So we know those things that are peculiar."* Policy constraints, such as bans of using certain technology in the classroom, also shape what is possible. T3 noted: *"There are schools in Nigeria where the use of cell phones are restricted... but if AI is now seen as a means of instruction... policy could change."* Parents were seen as central to adoption as well. T1 highlighted the need to secure their support: *"Parents will not accept that... the policy makers and then the parents are there."*

Together, these perspectives underscore that AI education requires alignment between teachers, policymakers, and families to become sustainable.

Discussion

We begin this section by framing our insights through Ubuntu, the African philosophy of relationality and collective well-being (see Table 1). We then conclude by discussing the pedagogical implications of these findings for diverse and resource-constrained settings.

Framing Findings through Ubuntu: Implications for Culturally Grounded AI Education

U – Universal: Global, intercultural/brotherhood/sisterhood,
B – Behaviour: Human (humane), caring, sharing, respect, compassion (love, appreciation)
U – United: Solidarity, community, bond, family
N – Negotiation: Consensus, democracy
T – Tolerance: Patience, diplomacy
U – Understanding: Empathy (forgiveness, kindness)

Figure 1: Ubuntu Meaning (Mukwedeya 2022), Page 229

These findings align with and extend existing scholarship on culturally responsive education and relational theories of learning. CRE foregrounds the integration of students' cultural knowledge and community values into classroom practice (Ladson-Billings 1995; Gay 2018), while culturally sustaining pedagogy emphasizes the ongoing support and evolution of learners' cultural identities (Paris 2012). In computing education, scholars highlight the need to embed learning within cultural ecosystems, honoring place-based knowledge, community epistemologies, and relational forms of meaning-making (Mhasakar et al. 2025; Bodon, Kumar, and Worsley 2025; Adejoro et al. 2023). Ubuntu complements these perspectives by offering a non-Western ontological grounding for relationality; one in which learning is constituted through interdependence, mutual care, and the co-construction of knowledge (Letseka et al. 2013; Eze 2016). Prior work in HCI and global computing education similarly argues that technology learning must attend to local values and community priorities rather than reproducing Western individualist assumptions (Anuyah et al. 2023; Srinivasan and Chander 2021; Garg and Sengupta 2020).

By showing how Nigerian teachers frame AI in terms of collective well-being and how U.S. teachers emphasize individual creativity and opportunity, our results empirically illustrate these theoretical distinctions. Table 2 summarizes how these orientations map onto Ubuntu values, highlighting patterns such as teachers' emphasis on global and intercultural understanding, compassionate engagement with students' ideas, community-centered learning goals, participatory decision-making, multilingual flexibility, and empathetic guidance in addressing children's AI misconceptions. Ubuntu thus provides a lens that reconciles these orientations by reframing AI literacy as a relational practice, consistent with calls for culturally situated, ethically grounded, and socially responsive AI education (Solyst et al. 2023; Nwogu et al. 2023; Iivari et al. 2024). In this way, our notion of relational AI literacy extends existing frameworks by foregrounding the communal, ethical, and contextual dimensions through which children encounter and understand AI.

Pedagogical Implications for Diverse and Resource-Constrained Settings

Across contexts, teachers described both the promise and difficulty of implementing AI education in resource-variable environments. Nigerian teachers emphasized infrastructural limitations, such as unreliable electricity, insufficient devices, and limited training, as barriers to equitable participation. Yet they also demonstrated adaptability through creative pedagogies, using storytelling, local examples, and low-tech simulations to explain AI concepts. These findings suggest that AI literacy can progress even without high-end technologies when supported by culturally relevant and participatory teaching methods. For EAAI audiences, several pedagogical implications emerge:

- **Ground AI in local relevance.** Teachers found that students engaged more deeply when AI lessons connected to local priorities such as agriculture, public health, or environmental challenges. Culturally anchored examples

help students see AI as a tool for solving meaningful community problems rather than as an abstract or foreign innovation.

- **Integrate critical reflection with creativity.** Both Nigerian and U.S. teachers noted "magic-box" misconceptions, students viewing AI as omnipotent or effortless. Educators can use reflection activities to help students question AI's limits, biases, and impacts while nurturing creativity.
- **Invest in teacher capacity.** Teachers called for professional development that blends theory with practical tools. Local communities of practice—sharing lessons, data, and reflections can ease AI adoption and foster experimentation in low-resource settings.
- **Leverage multilingual and community participation.** Teachers in multilingual classrooms advocated local-language AI materials and parent involvement to root learning in community networks.

These strategies demonstrate that AI education can be inclusive and sustainable when designed around human relationships, local knowledge, and context-aware pedagogy rather than technological uniformity.

Ubuntu Attribute	Mapped Finding and Implication
Universal (Global, intercultural brotherhood)	U.S. teachers appreciated the global perspectives in Nigerian students' essays, noting their potential to foster cross-cultural understanding. *Implication: Design AI curricula that include children's narratives from multiple cultural contexts to foster global digital citizenship.*
Behaviour (Caring, compassion, appreciation)	Teachers responded with empathy and care to children's social concerns, recognizing their imaginative ideas as grounded in lived struggles. *Implication: Treat children as knowledge holders and ensure AI education invites emotional, ethical, and social reflection, not just technical learning.*
United (Solidarity, community, bond)	Nigerian children's essays prioritized family and community well-being over individual goals. U.S. teachers noticed this collectivist orientation. *Implication: Design AI learning tools that center community-relevant problems and collaborative projects.*
Negotiation (Consensus, democracy)	Teachers emphasized the need to include educators, parents, and communities in shaping AI policies and curricula. *Implication: Develop participatory frameworks where stakeholders co-design AI education strategies, ensuring policies reflect local contexts.*
Tolerance (Patience, diplomacy)	Teachers noted the complexity of navigating diverse cultures and expectations in multilingual and multi-ethnic classrooms. *Implication: Incorporate flexibility in AI teaching resources to accommodate multiple languages, values, and traditions with sensitivity.*
Understanding (Empathy, kindness)	Teachers were patient and encouraging even when children's AI conceptualizations were flawed, emphasizing their creativity and intent. *Implication: Build pedagogical tools that nurture curiosity and imagination while gently correcting misconceptions about AI.*

Table 2: Mapping Findings to Ubuntu Values

Limitation

Although our study advances AI education by including African Sub-Saharan children and comparing teacher perspectives in Nigeria and the US, it has limitations. Our sample of students and teachers from specific schools provides rich but non-representative views; nonetheless, the cross-regional comparison highlights different technological and pedagogical contexts. Using student essays may have disadvantaged lower-proficiency writers; future work should add multimodal methods to capture wider expression, though essays yielded deep qualitative insight. Teacher exposure to AI also varied, especially in Nigeria, which may have shaped interpretations; yet including both resource-rich and resource-constrained settings clarifies how AI education can be approached across contexts. Overall, these constraints do not diminish the study's contributions; they situate its cross-cultural insights and point to promising directions spanning African and Western perspectives.

Conclusion

This research provides insights into the diverse perspectives of students and teachers from Nigeria and the United States, representing diverse cultural background. They provided different viewpoints regarding the integration of AI in educational contexts. It examined educators' perspectives to highlight both shared and differing views, emphasizing the need for AI education strategies that respect cultural values and adapt to diverse teaching contexts. Although the study shows a growing awareness and willingness among educators and learners to embrace AI technologies, this openness is not uniform. Instead, it reflects varying levels of enthusiasm and concern, highlighting diverse attitudes toward technological advancement in education. Though small, the teacher sample allows deep cross-cultural insights into AI in education, highlighting nuances larger surveys may miss and guiding inclusive, culturally adapted AI teaching worldwide.

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References

Adejoro, C. O.; Arn, L.; Schwartz, L.; and Yeh, T. 2023. Empower Children in Nigeria to Design the Future of Artificial Intelligence (AI) through Writing. In *Proceedings of the 22nd Annual ACM Interaction Design and Children Conference*, 677–680.

Amugongo, L. M.; Bidwell, N. J.; and Corrigan, C. C. 2023. Invigorating Ubuntu Ethics in AI for healthcare: Enabling equitable care. In *Proceedings of the 2023 ACM conference on fairness, accountability, and transparency*, 583–592.

Anuyah, O.; Wan, R.; Adejoro, C.; Yeh, T.; Metoyer, R.; and Badillo-Urquiola, K. 2023. Cultural Considerations in AI Systems for the Global South: A Systematic Review. In *Proceedings of the 4th African Human Computer Interaction Conference*, 125–134.

Arawjo, I.; and Mogos, A. 2021. Intercultural computing education: Toward justice across difference. *ACM Transactions on Computing Education (TOCE)*, 21(4): 1–33.

Bodon, H.; Kumar, V.; and Worsley, M. 2025. Design Principles for Authentically Embedding Computer Science in Sports. *ACM Trans. Comput. Educ.*, 25(2).

Bosch, C. A.; Gustafson-Quiett, M. C.; Hegly, S. A.; Wharton, S.; Masla, J.; Guterman, L.; Macatantan, C.; Klopfer, E.; Abelson, H.; and Breazeal, C. 2025. Advancing Research on Equitable AI Education Through a Focus on Implementation: Insights from a Middle School Computer Vision Module Beta-Test. In *Proceedings of the AAAI Conference on Artificial Intelligence*, volume 39, 29120–29127.

Braun, V.; and Clarke, V. 2006. Using thematic analysis in psychology. *Qualitative research in psychology*, 3(2): 77–101.

Candon, K.; Georgiou, N. C.; Ramnauth, R.; Cheung, J.; Fincke, E. C.; and Scassellati, B. 2025. Artificial Intelligence for Future Presidents: Teaching AI Literacy to Everyone. In *Proceedings of the AAAI Conference on Artificial Intelligence*, volume 39, 28988–28995.

Chau, K. L. 1990. A model for teaching cross-cultural practice in social work. *Journal of social work education*, 26(2): 124–133.

Constantin, A.; Korte, J.; Fails, J. A.; Good, J.; Alexandru, C. A.; Dragomir, M.; Pain, H.; Hourcade, J. P.; Eriksson, E.; Waller, A.; et al. 2019. Pushing the boundaries of participatory design with children with special needs. In *Proceedings of the 18th ACM International Conference on Interaction Design and Children*, 697–705.

Dahal, C. 2024. Revolutionizing education through AI-powered inclusive learning systems. In *Proceedings of the AAAI Conference on Artificial Intelligence*, volume 38, 23736–23737.

Deng, X.; and Joshi, K. 2024. Promoting Ethical Use of Generative AI in Education. *ACM SIGMIS Database: the DATABASE for Advances in Information Systems*, 55(3): 6–11.

Eze, M. 2016. *Intellectual history in contemporary South Africa*. Springer.

Farao, J.; Mthoko, H.; and Densmore, M. 2024. Transformative Narratives: Fostering Ubuntu-Inspired Participatory Design Practices. In *Proceedings of the Participatory Design Conference 2024: Exploratory Papers and Workshops-Volume 2*, 107–113.

Frankford, E.; Sauerwein, C.; Bassner, P.; Krusche, S.; and Breu, R. 2024. AI-tutoring in software engineering education: Experiences with large language models in programming assessments. 2024 IEEE/ACM 46th International Conference on Software Engineering: Software Engineering Education and Training (ICSE-SEET), 309–319.

Garg, R.; and Sengupta, S. 2020. Conversational technologies for in-home learning: using co-design to understand children's and parents' perspectives. In *Proceedings of the 2020 CHI conference on human factors in computing systems*, 1–13.

Gay, G. 2018. *Culturally responsive teaching: Theory, research, and practice*. teachers college press.

Gibellini, G.; Fabretti, V.; and Schiavo, G. 2023. AI Education from the Educator's Perspective: Best Practices for an Inclusive AI Curriculum for Middle School. In *Extended Abstracts of the 2023 CHI Conference on Human Factors in Computing Systems*, 1–6.

Göbl, B.; Duvivié, M.; Jovicic, S.; and Kayali, F. 2023. Towards Bridging the Gap between Participatory Design and Formal Education. In *Proceedings of the 22nd Annual ACM Interaction Design and Children Conference*, IDC '23, 652–656. New York, NY, USA: Association for Computing Machinery. ISBN 9798400701313.

Han, A.; Zhou, X.; Cai, Z.; Han, S.; Ko, R.; Corrigan, S.; and Peppler, K. A. 2024. Teachers, parents, and students' perspectives on integrating generative AI into elementary literacy education. In *Proceedings of the 2024 CHI Conference on Human Factors in Computing Systems*, 1–17.

Hwang, Y.; Das, A.; Waite, J.; and Sentance, S. 2023. Using a sociological lens to investigate computing teachers' culturally responsive classroom practices. In *Proceedings of the 2023 ACM Conference on International Computing Education Research-Volume 1*, 206–221.

Iivari, N.; Ventä-Olkkonen, L.; Sharma, S.; Hartikainen, H.; Holappa, J.; and Lehto, E. 2024. Fostering children? s critical literacy in computing education. In *Proceedings of the 2024 Symposium on Learning, Design and Technology*, 57–65.

Iversen, O. S.; Smith, R. C.; and Dindler, C. 2017. Child as Protagonist: Expanding the Role of Children in Participatory Design. In *Proceedings of the 2017 Conference on Interaction Design and Children*, IDC '17, 27–37. New York, NY, USA: Association for Computing Machinery. ISBN 9781450349215.

Ladson-Billings, G. 1995. But that's just good teaching! The case for culturally relevant pedagogy. *Theory into practice*, 34(3): 159–165.

Letseka, M.; et al. 2013. Educating for ubuntu/botho: lessons from Basotho indigenous education. *Open Journal of Philosophy*, 3(02): 337.

Li, Y.; Nwogu, J.; Buddemeyer, A.; Solyst, J.; Lee, J.; Walker, E.; Ogan, A.; and Stewart, A. E. 2023. "I Want to Be Unique From Other Robots": Positioning Girls as Co-creators of Social Robots in Culturally-Responsive Computing Education. In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems*, 1–14.

Long, D.; and Magerko, B. 2020a. What is AI Literacy? Competencies and Design Considerations. In *Proceedings of the 2020 CHI Conference on Human Factors in Computing Systems*, CHI '20, 1–16. New York, NY, USA: Association for Computing Machinery. ISBN 9781450367080.

Long, D.; and Magerko, B. 2020b. What is AI literacy? Competencies and design considerations. In *Proceedings of the 2020 CHI conference on human factors in computing systems*, 1–16.

Mhasakar, M.; Baker-Ramos, R.; Carter, B.; Helekahi-Kaiwi, E.-B.; and Hester, J. 2025. "I Would Never Trust Anything Western": Kumu (Educator) Perspectives on Use of LLMs for Culturally Revitalizing CS Education in Hawaiian Schools. In *Proceedings of the Extended Abstracts of the CHI Conference on Human Factors in Computing Systems*, CHI EA '25. New York, NY, USA: Association for Computing Machinery. ISBN 9798400713958.

Mukwedeya, J. 2022. Peace and Harmony through uBuntu in a Globalized World. *Comparative education for global citizenship, peace and shared living through uBuntu*, 221–241.

Nithithanatchinnapat, B.; Maurer, J.; Deng, X.; and Joshi, K. 2024. Future business workforce: Crafting a generative AI-centric curriculum today for tomorrow's business education. *ACM SIGMIS Database: The DATABASE for Advances in Information Systems*, 55(1): 6–11.

Nwogu, J.; Buddemeyer, A.; Farzan, R.; Stewart, A. E.; and Walker, E. 2023. Comic-boarding with Children: Understanding the use of Language in Human-Human and Human-Agent Dialogue. In *Proceedings of the 22nd Annual ACM Interaction Design and Children Conference*, IDC '23, 667–671. New York, NY, USA: Association for Computing Machinery. ISBN 9798400701313.

Paris, D. 2012. Culturally sustaining pedagogy: A needed change in stance, terminology, and practice. *Educational researcher*, 41(3): 93–97.

Pokrivčáková, S. 2019. Preparing teachers for the application of AI-powered technologies in foreign language education. *Journal of language and cultural education*.

Rajapakse, C.; Ariyarathna, W.; and Selvakan, S. 2024. A Self-Efficacy Theory-based Study on the Teachers' Readiness to Teach Artificial Intelligence in Public Schools in Sri Lanka. *ACM Transactions on Computing Education*.

Sanusi, I. T.; Martin, F.; Ma, R.; Gonzales, J. E.; Mahipal, V.; Oyelere, S. S.; Suhonen, J.; and Tukiainen, M. 2024. AI MyData: Fostering Middle School Students' Engagement with Machine Learning through an Ethics-Infused AI Curriculum. *ACM Transactions on Computing Education*, 24(4): 1–37.

Schepers, S.; Dreessen, K.; and Zaman, B. 2018. Fun as a user gain in participatory design processes involving children: a case study. In *Proceedings of the 17th acm conference on interaction design and children*, 396–404.

Septiandri, A. A.; Constantinides, M.; Tahaei, M.; and Quercia, D. 2023. WEIRD FAccTs: How Western, Educated, Industrialized, Rich, and Democratic is FAccT? In *Proceedings of the 2023 ACM Conference on Fairness, Accountability, and Transparency*, 160–171.

Solyst, J.; Xie, S.; Yang, E.; Stewart, A. E.; Eslami, M.; Hammer, J.; and Ogan, A. 2023. "I Would Like to Design": Black Girls Analyzing and Ideating Fair and Accountable AI. In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems*, CHI '23. New York, NY, USA: Association for Computing Machinery. ISBN 9781450394215.

Srinivasan, R.; and Chander, A. 2021. Biases in AI systems. *Communications of the ACM*, 64(8): 44–49.

Temitayo Sanusi, I. 2021. Teaching machine learning in K-12 education. In *Proceedings of the 17th ACM conference on international computing education research*, 395–397.

Uchidiuno, J.; Yarzebinski, E.; Keebler, E.; Koedinger, K.; and Ogan, A. 2019. Learning from african classroom pedagogy to increase student engagement in education technologies. In *Proceedings of the 2nd ACM SIGCAS Conference on Computing and Sustainable Societies*, 99–110.

Van Brummelen, J.; Kelleher, M.; Tian, M. C.; and Nguyen, N. 2023. What do children and parents want and perceive in conversational agents? Towards transparent, trustworthy, democratized agents. In *Proceedings of the 22nd annual ACM interaction design and children conference*, 187–197.

Wang, X.; and Fitri bin Haris, M. 2025. AI-Driven Violin Performance Evaluation: A Deep Learning Approach for Automated Assessment and Personalized Feedback in Music Education. In *Proceedings of the 2025 International Conference on Generative Artificial Intelligence and Digital Media*, 126–132.

Wood, D.; and Moss, S. H. 2024. Evaluating the impact of students' generative AI use in educational contexts. *Journal of Research in Innovative Teaching & Learning*.

Zhang, H.; Lee, I.; and Moore, K. 2024. An effectiveness study of teacher-led AI literacy curriculum in K-12 classrooms. In *Proceedings of the AAAI conference on artificial intelligence*, volume 38, 23318–23325.