

From human-centered to posthumanist AI-driven cross-cultural education: Practical and ethical dilemmas

Hana Al-Bannay ^{a*} 

^a Diryah Training and Development, Saudi Arabia.

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Highlights

- AI has transformed cross-cultural education from a human-centered paradigm into a posthumanist ecology of knowledge co-creation, introducing significant practical and ethical dilemmas.
- AI-driven education systematically automates, amplifies, and scales the inherent epistemic shortcomings of traditional cross-cultural education—including biased curricula, research limitations, and Eurocentric misrepresentations.
- This paradigmatic shift leads to practical problems—automated bias, undefined non-human agency, the exclusion of human values, and culturally misaligned content—that collectively undermine AI ethical principles of fairness, accountability, transparency, and reliability.
- Left unaddressed, this ecology risks turning AI-driven cross-cultural education into an engine of Eurocentric digital colonialism, privileging Western epistemology and further marginalizing alternative knowledge systems.

Abstract

The advent of artificial intelligence (AI) has transformed cross-cultural education from a human-centered paradigm into a posthumanist ecology, distributing cognitive agency across networks of human and non-human actors. While theoretically promising, this shift is fraught with practical and ethical dilemmas that threaten the goals of cross-cultural education. Employing critical discourse analysis, this paper introduces a novel analysis that first examines the epistemic shortcomings of human-centered cross-cultural education—including curricular bias and ineffective pedagogy, research limitations, and Eurocentric biases and misrepresentations. It then demonstrates how these shortcomings are systematically automated, amplified, and reinforced by posthumanist AI systems with opaque algorithms trained on biased datasets. The resulting practical problems—automation of biased data, undefined non-human agency, exclusion of human values, and culturally misaligned generated content—undermine AI ethical principles of fairness, accountability, transparency, and reliability. The synthesized analysis concludes that ignoring these considerations privileges dominant Western epistemology, with its inherent biases, and further marginalizes alternative knowledge systems, thereby turning AI-driven cross-cultural education into an engine of Eurocentric digital colonialism. To counter this, the article proposes a new model that addresses the identified problems and integrates essential human values—such as empathy, cooperation, and communication—for culturally competent AI-driven education.

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1. Introduction

For decades, the human-centered paradigm of cross-cultural education has emphasized direct human interaction as the essential pathway for developing cultural competency, fostering effective communication, mutual understanding, and respect across diverse cultural backgrounds (Holliday, 2021). This paradigm

* Corresponding author. Diryah Training and Development, Saudi Arabia.
e-mail address: hana.albannay@gmail.com

emerged in response to the recognized importance of cross-cultural knowledge exchange as a key driver for expanding the breadth and depth of scientific inquiry in academia (Mahboob et al., 2024). It has drawn upon universal human attributes—such as empathy, cooperation, and communication—supported by research demonstrating that these values connect individuals to society and foster a sense of global unity (Kostina et al., 2015). Accordingly, communication has served as the central mechanism, with technology functioning primarily as a tool to facilitate human-to-human interactions in cross-cultural exchanges.

However, the advent of sophisticated generative artificial intelligence (AI) has radically challenged this tradition (Nath & Manna, 2023). AI technologies now act as active mediating agents in cross-cultural communication. They are capable of translating languages, simulating cultural perspectives, generating content, and increasing access to vast amounts of cross-cultural knowledge (Mahboob et al., 2024). Consequently, situated within a posthumanist theoretical framework, AI-driven education has transformed the human-centered paradigm into an ecology in which agency is distributed across a network of human and non-human actors (Nath & Manna, 2023; Firdaus, 2025).

This transformation poses critical challenges for cross-cultural education. Large language models (LLMs) powering AI systems are culturally biased (Liu, 2024; Tao et al., 2024). This bias is embedded in AI-driven education and simultaneously automates and amplifies the epistemic shortcomings of traditional cross-cultural learning, thereby hindering the development of cultural competency—a core goal of cross-cultural education.

This paper argues that posthumanist AI-driven education, by decentering human agency, creates serious practical and ethical dilemmas that threaten the goals of cross-cultural education. In response, it proposes a new model that addresses these challenges.

2. Methodology

This paper employs critical discourse analysis (Holland & Novak, 2017) to examine the historical and socio-political dimensions of the posthumanist paradigm and its implications for AI-driven cross-cultural education. By revealing how these contextual dimensions enforce social inequalities and hierarchies, the analysis exposes the practical and ethical risks of the shift toward AI-driven cross-cultural education.

To develop the argument, the paper first analyzes three bodies of literature: traditional human-centered cross-cultural education to identify epistemic shortcomings, posthumanist theory to deconstruct its reflections of agency structures, and AI ethics to illustrate conflicts with posthumanist AI-driven cross-cultural education. It then synthesizes the identified systemic problems—the inherent epistemic shortcomings, the reproduced power structures in agency, and the compromised ethical principles—by mapping them onto the emerging model of posthumanist AI-driven cross-cultural education. The resulting synthesis illuminates the practical and ethical dilemmas within this new ecosystem, which threaten the goals of cross-cultural education.

3. Traditional Human-centered Cross-cultural Education

The pedagogical philosophy of cross-cultural education is grounded in developing cultural competency. Its key goals are to enable ethical and effective communication across cultures by fostering understanding and respect (Mite & Binawan, 2025; Mahboob et al., 2024; Holliday, 2021). The full achievement of these goals, however, is impeded by several factors, discussed below.

3.1. *Biased curricula and ineffective pedagogy*

Multiple factors obstruct the effectiveness of cross-cultural education. A primary issue is the lack of authentic representation of global cultures. Students' access to cultural perspectives is often limited to materials curated through the lens of Western publishers, which risks perpetuating overgeneralizations and

biases, while framing Western epistemic views as the default (Andreotti, 2011). As a result, educational curricula fail to delve into the complex interplay of values, beliefs, and historical contexts necessary for a nuanced understanding of cultures (Basnet, 2024). This lack of deep understanding is exacerbated when culture is reduced to a superficial, tourist-like focus on food and festivals (Holliday, 2021), or when educators lack the specialized intercultural training needed to facilitate effective discussions on cultural sensitivity. The limited validity of cross-cultural competency assessment tools, often based on self-report, makes it difficult to accurately evaluate educators' pedagogical skills or students' learning outcomes (Basnet, 2024). These issues render cross-cultural education reductive and ineffective, hampering the development of cultural competency.

3.2. Limitations within the traditions of scientific inquiry

Bias in Western-centered educational materials can be attributed to epistemological limitations within dominant research paradigms. The knowledge presented in these materials often stems from cross-cultural research, which is traditionally divided into two methodological approaches: quantitative and qualitative. Within a positivist framework, quantitative research—originally developed within the natural sciences—is often privileged as the most reliable and objective form of inquiry. Accordingly, proponents argue that the laws of human behavior and social life can be discerned through systematic, objective, experimental, and deductive modes of inquiry. This approach explains social phenomena by collecting numerical data that are analyzed using mathematical techniques, thereby investigating cause-and-effect relationships and providing a basis for accepting or rejecting theories (Mohajan, 2020). However, without the researcher's direct observation of human interactions, significant intervening social and cultural factors are excluded from the interpretation of human behavior (Putri et al., 2024).

To address these limitations, qualitative approaches rooted in constructivism were developed. Constructivism posits that knowledge is generated through individuals' understanding and interpretations of phenomena within historical and social contexts. This perspective originated with Western colonial ethnographers' attempts to understand other societies and was later formalized by modern scholars into standard qualitative methods. In this paradigm, reality is constructed through individuals interacting and creating meaning from their social world. However, this constructive approach is criticized for being less evidence-based and biased by researchers' subjective views. Subsequently, a mixed-methods paradigm gained prominence to integrate the strengths of both approaches (Pant, 2023). This integration allows interpretive methodologies to be used jointly with statistical approaches. Scholars of scientific methodology increasingly advocate for collaborative and interdisciplinary research to better understand the complexities of our social world, acknowledging the inherent limitations of any single scientific approach (Putri et al., 2024). However, practical issues such as time constraints, institutional processes, and funding make the integration of both approaches difficult to implement.

3.3. Eurocentric Biases and misrepresentations

The inherent heterogeneity and incomparability of sociocultural settings constitute a foundational challenge in cross-cultural education. This problem has led to the uncritical export and application of Western-centered conceptions to entirely different contexts—a phenomenon scholars label as Eurocentrism (Connell, 2020; Rifai, 2022). For instance, Western political terms like conservatism and liberalism are often applied as analytical frameworks in divergent socio-cultural settings, despite their lack of conceptual equivalence (Chakrabarty, 2009).

Examining the application of both terms in non-Western contexts illustrates the critical impact of Eurocentric biases on cross-cultural epistemology. In Western cultures, liberals typically believe that social change is essential for progress and reform. They prioritize individual freedom and rights, focusing on improving society through the pursuit of social justice, equity, and equality. As a result, liberals tend to be less religious, often adopting secularism. In contrast, conservatives generally adhere to social traditions and the existing social order. They often view religion and traditional family systems as aligned with a “natural”

hierarchy of social roles. They tend to question social change and are commonly characterized as “old-fashioned” (Heywood, 2021).

In other cultures, social and historical contexts are distinct from those of the West. In the Arab and Muslim world, for example, societies are rooted in ancient civilizations that were shaped by the emergence of some of the world's largest religions, including Christianity. Historically, people in these regions spoke different languages within diverse cultural contexts but were later unified by the expansion of Islam (Rifai, 2022). The epistemology and application of universal ethical values, which constitute integral religious principles, such as social justice and equity, vary across the diversity of the Islamic schools of thought and local contexts (Karimullah, 2023; Rifai, 2022).

Unlike in Western sociology, social change in Islamic thought is conceptually understood as *ijtihad*, a process where scholars use foundational religious sources to derive ethical principles and make reasoned judgment. Furthermore, different from Western conservatism, patriarchy and hierarchy were embedded in Arab and Muslim contexts long before the advent of Islam, a period in which women were often treated as the property of men. With the emergence of Islam, women's status was reformed (Karimullah, 2023); however, this system of reform exists in constant tension with ancient patriarchal norms, a tension mirrored in the diverse interpretations across the Islamic schools of thought and local cultural contexts. Islamic views, therefore, can be presented as a complex middle ground, and the lifestyles within Arab and Muslim communities are shaped by the interplay of divergent historical, socio-cultural, and religious layers (Karimullah, 2023; Rifai, 2022). As a result, the socio-political landscape of the Arab and Muslim world does not conform to the binary descriptions of Western categories. Nonetheless, scholarly analyses of Islam and modernity continue to operate within such a Eurocentric framework (Jubba et al., 2022; Qodir & Singh, 2023; Jung, 2023).

Eurocentric lenses have become dominant and are often uncritically applied to analyze diverse cultural contexts—including Muslim, Asian, and African cultures, as well as Indigenous knowledge systems—leading to ethnocentrism. Scholarly critiques demonstrate that applying Western conceptions across cultures translates into a critical methodological problem (Gwaravanda & Ndofirepi, 2020; Johnston & Mason, 2021; Miike, 2023).

Eurocentrism constitutes another form of bias in cross-cultural education materials: the misrepresentation of world cultures by hegemonic Western narratives. Critics contend that Western discourse employs Orientalist and stereotypical lenses, rooted in historical colonization, to maintain imperialist supremacy (Said, 1978). For instance, Arabs are frequently portrayed as outdated, primitive nomads—uncivilized and inferior—thereby necessitating Western supervision (Alshokhada, 2025). Muslim women are predominantly depicted as helpless victims: oppressed, uneducated, passive or subservient figures in need of salvation, reinforcing a “White savior” complex (Akabli & Chahdi, 2022). This phenomenon of Western misrepresentation is systemic, extending beyond the Arab context to several cultures. For instance, the Chinese culture is often presented as either a primitive ancient civilization or a monolithic modern threat, obscuring its complex socio-cultural realities (Chow, 2023; Peters et al., 2022). These cultural stereotypes have become embedded in the Western mindset and are perpetuated in cross-cultural educational materials.

As a result of these epistemic shortcomings—biased curricula and ineffective pedagogy, research limitations, and Eurocentric biases and misrepresentations—cross-cultural education faces the formidable challenge of dismantling deep-seated Western biases, ethnocentrism, and preconceived images. These issues are reinforced in AI-driven education, where opaque algorithms trained on biased datasets automate and amplify these problems at scale (Liu, 2024; Tao et al., 2024).

4. Posthumanism in AI-Driven Cross-Cultural Education

Informed by a posthumanist framework, AI-driven cross-cultural education challenges the foundational goals of the traditional human-centric model. Posthumanism is a philosophical and cultural movement that

critiques and moves beyond traditional anthropocentric (human-centric) views of the world. It challenges the idea that humans are the central actors in the universe, emphasizing instead the deep interconnectedness of humans, technology, animals, and the environment (Nath & Manna, 2023; Thomsen & Wamberg, 2020).

Emerging from postmodernism's rejection of universal truths and rigid structures, posthumanism was first critically employed by Ihab Hassan (1977) and is rooted in earlier philosophical thought, such as Friedrich Nietzsche's concept of the *Übermensch* (Overman)—a being who transcends human limitations. Posthumanism focuses on deconstructing the concept of the human, opposing hierarchical views that place humans above other species and nature. It argues that all forms of life, and even non-living entities and systems, possess intrinsic value and agency (Nath & Manna, 2023; Thomsen & Wamberg, 2020).

Within posthumanism, the concept of humanity is deconstructed through a critical interrogation of what it means to be human, thereby challenging established biological, cultural, and philosophical definitions. Human identity is understood as being shaped by the constant interplay of technology (e.g., digital interfaces), culture (e.g., media, art, and literature), and historical context (e.g., the development of philosophical theories and social movements). Therefore, humans are reconceptualized as cyborgs—hybrid fusions of the organic and the machine (Nath & Manna, 2023; Thomsen & Wamberg, 2020).

It is essential to distinguish posthumanism from transhumanism. While transhumanism seeks to enhance human abilities through technology (e.g., genetic engineering) to overcome biological limits, posthumanism is more critical, questioning the very category of the human and exploring what might exist after human-centric paradigms (Nath & Manna, 2023).

Thus, posthumanism does not seek to erase humanity but rather to expand its definition. It envisions a future where humans coexist with other forms of life and intelligence—biological, artificial, and ecological—on more equitable terms (Nath & Manna, 2023; Thomsen & Wamberg, 2020). Through its radical critique of anthropocentrism, it paves the way for a new landscape of ethical, social, and philosophical inquiry.

Similarly, the posthumanist framework does not simply advocate for adding AI to existing educational models. It reframes AI as an active, agential participant in the educational process and calls for a paradigmatic shift towards understanding education as a complex ecosystem where humans and intelligent machines co-create knowledge (Firdaus, 2025; Nath & Manna, 2023).

Consequently, contrary to the traditional human-centered model where technology is a passive tool for human use, posthumanism fundamentally alters the dynamics of teaching, learning, and knowledge creation. It establishes a collaborative entanglement between learners, educators, and intelligent algorithms, where cognition is distributed across a network of human and non-human actors (Firdaus, 2025; Nath & Manna, 2023). This raises a core dilemma: biased machines, which automate and scale epistemic shortcomings, become co-creators of cross-cultural knowledge in AI-driven education.

This process of systemic automation is supported by findings on embedded cultural bias within LLMs (Liu, 2024; Tao et al., 2024). Such bias stems from multiple sources. It originates in historically skewed training data that embeds prevailing social hierarchies. For example, textual analysis of job ads for male-dominated fields shows they often employ stereotypically masculine language (e.g., “aggressive” and “competitive”), mirroring historical patterns of Western male dominance (Gaucher et al., 2011). Additionally, opaque algorithmic design—rooted in flawed metrics and models trained on biased historical data—is another key factor. This is illustrated by racial biases in tools like the COMPAS recidivism algorithm, which produced false positives for 45% of Black offenders versus 23% of White offenders (Angwin et al., 2016). The problem of bias is also compounded by the primary reliance of LLMs on English-language corpora, exacerbating cultural stereotypes and reinforcing hegemonic Western views as a default (Liu, 2024). This flaw is confirmed in models like ChatGPT, which default to American culture and fail in non-Anglophone contexts (Ahmad et al., 2024). Finally, this bias is amplified by feedback loops from user interactions (Liu,

2024), evidenced in platforms such as news recommender systems (NRS) where engagement with biased content reinforces cultural stereotypes (Pagan et al., 2023).

These interconnected factors demonstrate how LLMs exacerbate cultural bias, homogenize dominant Western perspectives, and amplify societal prejudices. Such automated biases are then integrated into AI-driven education, an ecosystem that decentralizes human agency while simultaneously automating the epistemic shortcomings of cross-cultural learning. This process not only undermines the development of cultural competency but also creates a fundamental conflict with core AI ethical principles.

5. AI Ethics in Posthumanist AI-driven Cross-cultural Education

Applying a posthumanist standpoint to AI-driven cross-cultural education reveals a critical equity flaw: AI systems trained on biased data automate predominant Western epistemology, presenting its inherent biases as universal. This is not merely a technical oversight, but a form of Eurocentric digital colonialism driven by dominant perspectives (Liu, 2024; Nemorin, 2024). If left unaddressed, this dynamic will continue to override and marginalize other knowledge systems. This systemic fault—expanded by anthropocentric shortcomings of traditional human-centered education—undermines the AI ethic of fairness (Firdaus, 2025).

AI-driven learning systems must, therefore, prioritize dismantling these biases to ensure AI platforms represent a true pluriversity of cultures (Noel et al., 2023). This is essential for challenging the embedded Eurocentric hierarchy within cross-cultural learning resources. However, designing a landscape that creates a fair and just ecosystem for all participants—human and non-human—is inherently complex. The goal of such a design is to ensure that AI-driven education breaks from epistemic shortcomings in cross-cultural learning and also neutralizes algorithmically biased machines, but this is far from straightforward.

By de-centering the human and challenging anthropocentric systems, posthumanism posits that AI functions as an active, agential participant in the learning ecosystem (Firdaus, 2025). Consequently, AI's role and potential interests must be considered, moving beyond exclusively human concerns (Nath & Manna, 2023). This introduces significant new challenges and prompts a profound reshaping of ethical frameworks.

Foremost among these is the problem of accountability for non-human agents (Firdaus, 2025). When AI, trained on biased databases, co-creates cultural interpretation, it becomes intensely challenging to assign responsibility for inaccurate or offensive outputs. Should blame fall to the programmer, the educational institution, or the algorithm itself?

A further critical risk involves the treatment of cultural data. If AI analyzes cultural content through the paradigm of quantitative methods, the requirement of algorithmic objectivity will replicate existing limitations in cross-cultural research. Conversely, if a constructivist approach is integrated with AI perspective—biased and devoid of empathetic human understanding—it will systematize and inflate automated biases. In the second scenario, an essential human value is excluded, and transparency is compromised, as the AI's interpretations—lacking explainability—remain incompletely comprehensible to its human co-participants (Nath & Manna, 2023).

These issues culminate in a significant threat to AI robustness: the perpetuation of cultural misalignment compromises the reliability essential to AI ethics. This issue mirrors Eurocentrism: Western AI platforms feature major gaps in their adjustment to diverse societies, which fundamentally diminishes the reliability of their cultural outputs (Ahmad et al., 2024; Cao et al., 2023).

Altogether, the posthumanist shift in AI-driven education introduces significant practical and ethical risks to cross-cultural learning. Practical problems—arising from algorithmically biased machines automating skewed data, the challenge of defining non-human agency, the exclusion of essential human values, and the generation of culturally misaligned content—collectively obstruct foundational AI ethical principles, including fairness, accountability, transparency, and reliability. The failure to address these issues will threaten the foundational goals of cross-cultural education.

6. Synthesis and Implications

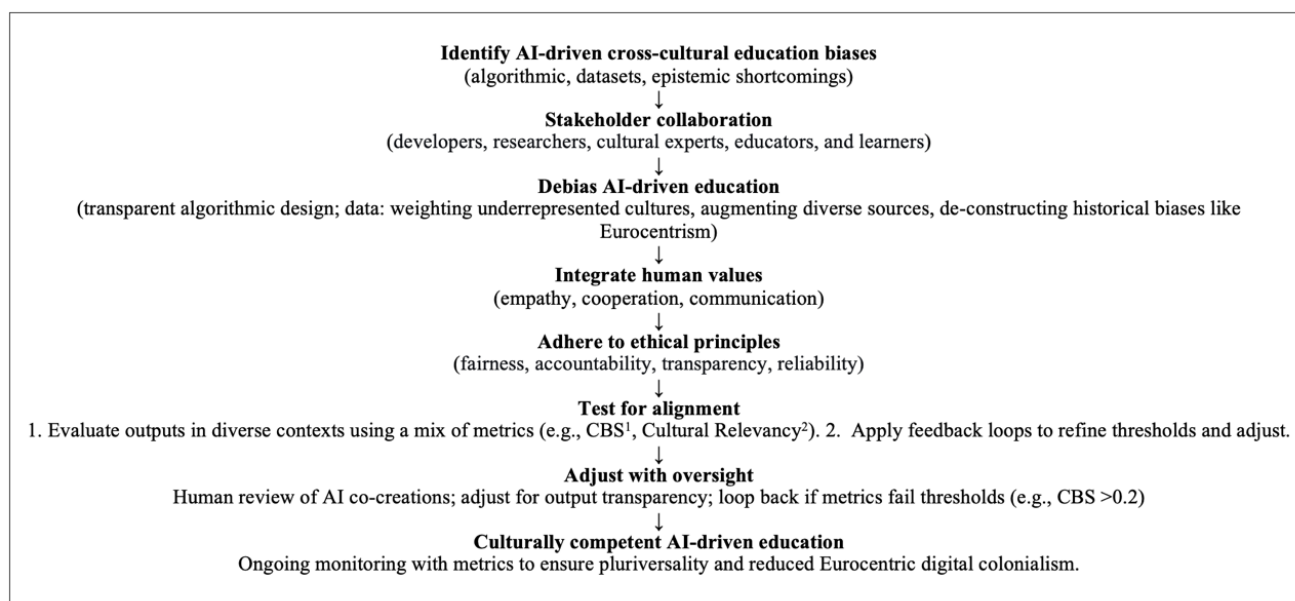
This paper has argued that the shift from human-centered to posthumanist AI-driven cross-cultural education poses practical and ethical dilemmas that threaten the goals of cross-cultural learning. Devoid of human values, critical awareness, and nuanced understanding of cultures, AI automates, inflates, and reinforces inherent cultural biases and stereotypes. Its documented shortfalls—including limited and biased data, a lack of context, absent emotional intelligence, and poor engagement—undermine the essential human role in interpreting the fluidity of human lives within diverse cultural contexts (Gautam et al., 2025; Girju, 2023; Yang, 2025).

The preceding analysis confirms that the theoretical move to decenter the human and embrace a more inclusive ecology of human and non-human actors in AI-driven education impedes the goals of cross-cultural education. While promising in theory, in practice this shift systematizes epistemic shortcomings and enforces the very cultural biases it seeks to overcome.

The practical problems arising from the posthumanist framework within AI-driven cross-cultural education can be summarized as follows: first, AI systems embedding new biases and automating inherent epistemic shortcomings in cross-cultural education; second, the operational challenge of defining non-human agency; third, the exclusion of essential human values from algorithmic processes; and finally, the generation of culturally misaligned content. These issues collectively obstruct fundamental AI ethical principles, including fairness, accountability, transparency, and reliability. Consequently, these intertwined practical and ethical dilemmas pose a systemic threat to the core goals of cross-cultural education.

Translating this critical diagnosis into practice necessitates a collaborative effort from both developers and educators, targeting both the design and pedagogy of inclusive learning. A primary task for developers is to abide by ethical guidelines. For example, when producing models, they must be transparent in disclosing data sources, training methodologies, and potential biases (Liao & Vaughan, 2024). Moreover, they must employ appropriate evaluation metrics that reflect different users within diverse contexts (Turner Lee et al., 2019; Cao et al., 2022). User feedback from individuals and communities, particularly those underrepresented or marginalized, is necessary to understand their concerns, expectations, and preferences, and to subsequently improve the design. Furthermore, exposing AI models to various cultural contexts and languages helps increase cultural diversity. Given that some cultures are underrepresented, augmenting training data with new sources can generate more balanced datasets and increase the weight of diverse cultural representations (Tao et al., 2024; Garimella et al., 2022).

Similarly, educators should be trained to use AI ethically to promote cultural diversity within AI-driven education platforms. This increases educators' awareness of how biases are perpetuated and their harmful impacts, enabling them to make informed decisions accordingly (Bender et al., 2021; Dev et al., 2023). Integrating these ethical principles into the classroom enables both educators and learners to routinely deconstruct AI-generated content to expose bias (Kotek et al., 2023). Transparent educator-learner dialogues empower culturally marginalized students to co-create knowledge that challenges biased AI narratives. This positions educators and learners as essential agents in co-creating culturally appropriate knowledge, actively reshaping the posthumanist ecology to meet the goals of cross-cultural education (Naous et al., 2024; Ramesh et al., 2023). A proposed model to develop culturally competent AI-driven education is illustrated in Figure 1.



¹Cultural Bias Score (CBS): Quantifies overrepresentation of Western narratives vs. underrepresented cultural views (Scale: 0 = Poor alignment, 1 = Strong alignment).

²Cultural Relevancy Scores from User Feedback: Diverse users rate outputs (assessed on a 5-point Likert scale of cultural appropriateness, with a target mean score >4.0).

This model is based on studies on bias in language learning tools (Lewis, 2025) and on mitigating and evaluating cultural bias in AI outputs (Garimella et al., 2022; Tao et al., 2024; Mak & Luo, 2025).

This paper provides a novel critical framework for analyzing the intersection of posthumanism, AI ethics, and cross-cultural education, offering a diagnostic model for understanding cultural bias in AI-driven learning systems, along with a proposed pathway toward culturally competent design. However, the study has several limitations. First, the synthesized evidence is primarily theoretical. It is built on mapping identified problems from existing scholarship onto posthumanist AI-driven cross-cultural education. Second, the analysis adopts a critical stance toward the posthumanist shift. While this focus effectively exposes significant risks, it may overlook potential beneficial applications of AI in cross-cultural education (e.g., increased access to language translation). Finally, while the study is diagnostic in focus, its proposals are preliminary, leaving the development of new models to address these issues as essential future work.

Future research is needed to address the knowledge gap in cultivating cultural competency within AI-driven cross-cultural learning systems. This necessitates empirical investigations focused on designing and testing interventions to overcome the identified practical and ethical risks, thereby building inclusive AI-driven educational platforms. It requires pilot studies where developers, researchers, cultural experts, educators, and learners collaborate to mitigate bias, such as engineering AI systems for epistemological pluralism and debiasing cultural datasets. Experimental studies are recommended to develop models that integrate AI as a co-participant while ensuring critical human oversight; for instance, studies that evaluate the outcomes of using pluriversal datasets in multicultural classrooms or assess the impacts of human-AI cognitive collaboration on cultural competency. Philosophical work is also needed to reconcile the posthumanist decentering of human agency while rigorously adhering to AI ethical principles.

The preceding synthesis concludes that ignoring the identified practical and ethical considerations systematically privileges dominant Western knowledge and further marginalizes alternative epistemologies, threatening to turn AI-driven cross-cultural education into an engine of Eurocentric

digital colonialism. A new model that addresses these problems is therefore essential: one that does not compromise human values—such as empathy, cooperation, communication—necessary for culturally competent AI-driven education.

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