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From global technologies to local realities: Conceptualizing human-centered AI integration in Caribbean language education

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Abstract

The rapid advancement of Generative Artificial Intelligence (GenAI) is reshaping educational systems worldwide, yet discussions on Artificial Intelligence in Education (AIED) have largely overlooked the unique realities of Caribbean language education. The region's multilingual ecologies, Creolophone identities, uneven digital infrastructures, and postcolonial educational contexts necessitate a more context-sensitive approach to AI integration. This conceptual article examines the current state of AI in Caribbean language education and argues that meaningful adoption requires moving beyond technology-centered perspectives toward a human-focused and culturally responsive framework. Drawing on contemporary AIED scholarship and regional educational realities, the article proposes the Caribbean Human-Centered Artificial Intelligence in Language Education (CHAILE) Framework as an extension of the Carib-AIM framework. The framework conceptualizes AI integration as a dynamic interaction among teacher capacity and professional agency, institutional support and infrastructure, pedagogical affordances of AI, learner engagement and critical AI literacy, and contextually relevant language learning outcomes. In doing so, it positions AI as a cognitive and pedagogical partner that augments rather than replaces human thinking, professional judgment, and authentic language learning. The article further outlines strategic priorities for effective AI adoption in Caribbean language education, including strengthening teacher preparation and professional development, promoting critical AI literacy, redesigning pedagogical and assessment practices, fostering interdisciplinary collaboration, and developing Caribbean-centered AI systems that reflect the region's linguistic and cultural diversity. It also identifies key directions for future research concerning multilingual AI systems, culturally responsive pedagogies, educational equity, and the long-term implications of human-AI partnerships in language learning. By advancing a

regionally-informed conceptualization of AI integration, this article contributes to the emerging AIED literature by foregrounding issues of cultural authenticity, linguistic inclusion, and human agency. Ultimately, it argues that the transformative potential of AI in Caribbean language education will depend less on technological sophistication and more on the region's capacity to develop equitable, culturally-situated, and pedagogically meaningful AI ecosystems.

Keywords: Artificial Intelligence in Education, Caribbean language education, Generative Artificial Intelligence, human-centered AI, critical AI literacy, pedagogical innovation

Introduction

The rapid advancement of Artificial Intelligence (AI), particularly Generative Artificial Intelligence (GenAI), is reshaping educational systems worldwide by creating new opportunities for instructional innovation, personalized learning, and knowledge production (Ikram et al., 2026; Khalifeh et al., 2026). Within language education, GenAI technologies such as ChatGPT, Gemini, and machine translation systems have attracted considerable scholarly attention due to their capacity to support language production, provide adaptive feedback, facilitate conversational practice, and generate instructional resources (Lee et al., 2026). These developments have prompted growing discussions concerning the future of language teaching, learning and assessment practices, and the extent to which AI may fundamentally transform pedagogical practices and educational experiences (Madden et al., 2026).

Despite this global momentum, discussions surrounding Artificial Intelligence in Education (AIED) have largely been dominated by scholarship originating from North America, Europe, and East Asia, often overlooking the realities of small island developing states (SIDS) and post-colonial educational systems. Major AIED reviews and position papers identify several inter-related priorities for future research, including AI-supported personalized learning, intelligent tutoring systems, learning analytics, teacher roles and professional development, assessment redesign, ethical governance, and human–AI collaboration (Hwang et al., 2020; Tu & Lu, 2025). More recently, scholars have argued that AIED research should move beyond evaluating learners' performance outcomes to examine how learners and teachers are guided to interact with AI systems and how AI-supported pedagogies are designed and implemented (Hwang et al., 2026). This perspective underscores the importance of transparency, ethics, and pedagogy as interconnected dimensions for ensuring the validity, accountability, and educational relevance of AI-enhanced learning environments.

The Caribbean represents a particularly important yet underexplored context for understanding these issues. Although the region shares certain educational aspirations with other parts of the world, it is distinguished by multilingualism, linguistic hybridity, widespread Creolophone identities, persistent digital inequalities, and educational systems shaped by colonial legacies and resource constraints (Arias Ortiz et al., 2024; Milson-Whyte, 2018; Sappleton & Adams, 2022). These realities profoundly influence how educational technologies are adopted, interpreted, and implemented across Caribbean societies. They also expose important gaps in mainstream AIED scholarship, which has paid comparatively limited attention to how AI can support culturally and linguistically responsive pedagogies, how teachers exercise agency within resource-constrained environments, and how equitable and

meaningful human–AI partnerships can be cultivated without reproducing existing educational and sociolinguistic inequalities.

The potential of GenAI in Caribbean language education is especially significant. Language learning occupies a central position within Caribbean educational systems, where English often coexists with various creoles and other languages in complex sociolinguistic ecologies (Duarte & Ezzedinne, 2026; Myrick et al., 2019). AI technologies possess considerable potential to support language instruction through personalized learning pathways, intelligent tutoring systems, automated feedback, translation assistance, and adaptive resource generation (Bai, 2025). In contexts where educational resources and specialist language support may be unevenly distributed, such affordances offer opportunities to enhance access, improve instructional efficiency, and facilitate more individualized language learning experiences.

However, the integration of GenAI into Caribbean language education is not without challenges. Existing AI systems are predominantly trained on standardized global language varieties and frequently fail to adequately represent the linguistic diversity and culturally embedded communicative practices characteristic of Caribbean societies (Lewis, 2025). Consequently, AI-generated outputs may privilege dominant linguistic norms while marginalizing local varieties, dialects, and creole-mediated forms of communication. Such limitations raise important concerns regarding linguistic authenticity, cultural representation, and equity in technology-mediated learning environments. Moreover, questions surrounding academic integrity, learner overreliance on AI, diminished critical engagement, and the future of authentic language production have become increasingly prominent within language education globally (Madden et al., 2025; Zhai et al., 2024) and are likely to have particularly profound implications within multilingual and Creolophone contexts.

Institutionally, the Caribbean appears to occupy a transitional stage of AI readiness. Although educators across the region are increasingly experimenting with GenAI tools for lesson planning, content creation, assessment support, and language learning activities, many educational institutions continue to grapple with limited technological infrastructure, insufficient professional development opportunities, inadequate policy frameworks, and unresolved ethical questions concerning responsible AI use (Arias Ortiz et al., 2025; Madden et al., 2024). Consequently, AI integration frequently depends upon individual educators' initiative and technological confidence rather than systematic institutional preparedness. This unevenness suggests that the Caribbean has progressed beyond initial awareness and experimentation but has yet to achieve coherent, equitable, and educationally grounded AI implementation.

These realities highlight the need for context-sensitive conceptualizations of AI integration that move beyond technologically deterministic perspectives and universalistic assumptions of AI adoptions and account for the unique sociocultural, linguistic, and institutional conditions of Caribbean education. Recent multidisciplinary scholarship has similarly emphasized the importance of addressing issues of equity and inclusion, ethical and social sustainability, pedagogical design, and interactions between humans and educational technologies in shaping the future of AI-enhanced learning environments (Allison et al., 2025). Yet, these concerns have received relatively limited attention within Caribbean language education research.

Responding to this gap, this article proposes a human-centered conceptual framework that identifies the micro-level components necessary for operationalizing AI integration in Caribbean language education. The framework acknowledges the region's shared educational, sociolinguistic, and technological challenges while recognizing that individual countries and institutions navigate distinct contextual realities. Building on this foundation, the article outlines practical strategies for fostering responsible and contextually responsive AI integration and offers recommendations to guide future research and practice in the region. In doing so, it

extends contemporary AIED debates by demonstrating that issues of personalization, human–AI collaboration, ethical implementation, and pedagogical transformation must be reinterpreted within multilingual, postcolonial, and resource-constrained educational contexts.

Conceptual Framework

The Caribbean Human-Centered Artificial Intelligence in Language Education (CHAILE) Framework (see Figure 1) is conceptualized as a pedagogical extension and domain-specific operationalization of the Caribbean Contextualized Artificial Intelligence-Mediated (Carib-AIM) Framework proposed by Madden et al. (2026). While Carib-AIM offers a macro-level, context-sensitive model for understanding AI integration in Caribbean education by emphasizing the dynamic interactions among technological affordances, human pedagogical mediation, ethical and epistemic tensions, sociolinguistic and cultural contextualization, and transformative pedagogical adaptation, CHAILE translates these broad theoretical principles into the specific context of language education. In doing so, it extends Carib-AIM by explicating the mechanisms through which these macro-level forces shape teaching practices, learner experiences, and language learning outcomes in AI-mediated environments.

The extension begins with Carib-AIM's principle of transformative pedagogical adaptation, which recognizes that effective AI adoption requires supportive educational ecosystems capable of responding to technological change. CHAILE operationalizes this proposition through the dimension of Institutional Conditions, encompassing AI governance frameworks, technological infrastructure, leadership support, ethical guidelines, and professional development opportunities. This dimension acknowledges that pedagogical innovation is contingent upon institutional readiness and that sustainable AI integration in language education cannot rely solely on individual teacher initiative.

CHAILE further extends Carib-AIM's emphasis on human pedagogical mediation by positioning Teacher Capacity and Professional Agency as the principal mediating mechanisms through which AI becomes educationally meaningful. Consistent with Carib-AIM's rejection of technological determinism, CHAILE conceptualizes teachers as active interpreters and orchestrators of AI integration rather than passive consumers of technological outputs. However, it advances the discussion by identifying the competencies that enable such mediation, including AI literacy, evaluative judgment, pedagogical decision-making, and critical digital competence. Consequently, the framework provides a more granular explanation of how human mediation is enacted within language teaching and learning processes.

Similarly, CHAILE elaborates Carib-AIM's notion of technological affordances through the dimension of Pedagogical Affordances of AI. Whereas Carib-AIM identifies the transformative potential of AI for supporting personalized learning, adaptive feedback, multilingual communication, and instructional efficiency, CHAILE demonstrates how these affordances are operationalized in language education through intelligent feedback, translation support, conversational practice, content generation, resource development, assessment redesign, pedagogical co-support, and cognitive amplification. These constructs position AI as a mediating and augmentative technology that extends educational possibilities while preserving human intellectual ownership and pedagogical authority.

The framework also extends Carib-AIM's concern with ethical and epistemic tensions by foregrounding Student Learning Processes. Carib-AIM highlights the tensions between efficiency and deep learning, innovation and authenticity, and AI assistance and originality. CHAILE translates these concerns into learner-centered processes by emphasizing self-regulated learning, critical thinking, metacognitive reflection, creativity, and responsible AI use. In doing so, the framework recognizes that the educational value of AI is ultimately dependent upon

sustained cognitive engagement and the extent to which learners exercise agency over their learning processes rather than delegating intellectual work to automated systems.

Finally, CHAILE directly builds upon Carib-AIM’s dimension of sociolinguistic and cultural contextualization by situating all aspects of AI integration within the broader Caribbean Sociocultural Context. Both frameworks recognize that Caribbean education is shaped by multilingualism, creolophone identities, cultural hybridity, unequal technological access, and enduring colonial legacies that influence educational practice and language ideologies. However, CHAILE extends this perspective by positioning cultural responsiveness and linguistic authenticity as explicit educational imperatives. The framework therefore acknowledges that AI systems frequently privilege standardized global language norms and consequently require critical adaptation to ensure that local linguistic varieties and culturally situated ways of knowing are appropriately represented within language learning environments.

Viewed collectively, CHAILE functions as the pedagogical enactment of Carib-AIM within language education. Carib-AIM provides the overarching theoretical architecture that explains the contextual, ethical, and sociocultural conditions shaping AI integration across Caribbean education systems, whereas CHAILE specifies the pathways through which these conditions influence instructional practice and learning outcomes in language classrooms. Consequently, the relationship between the two frameworks is both hierarchical and

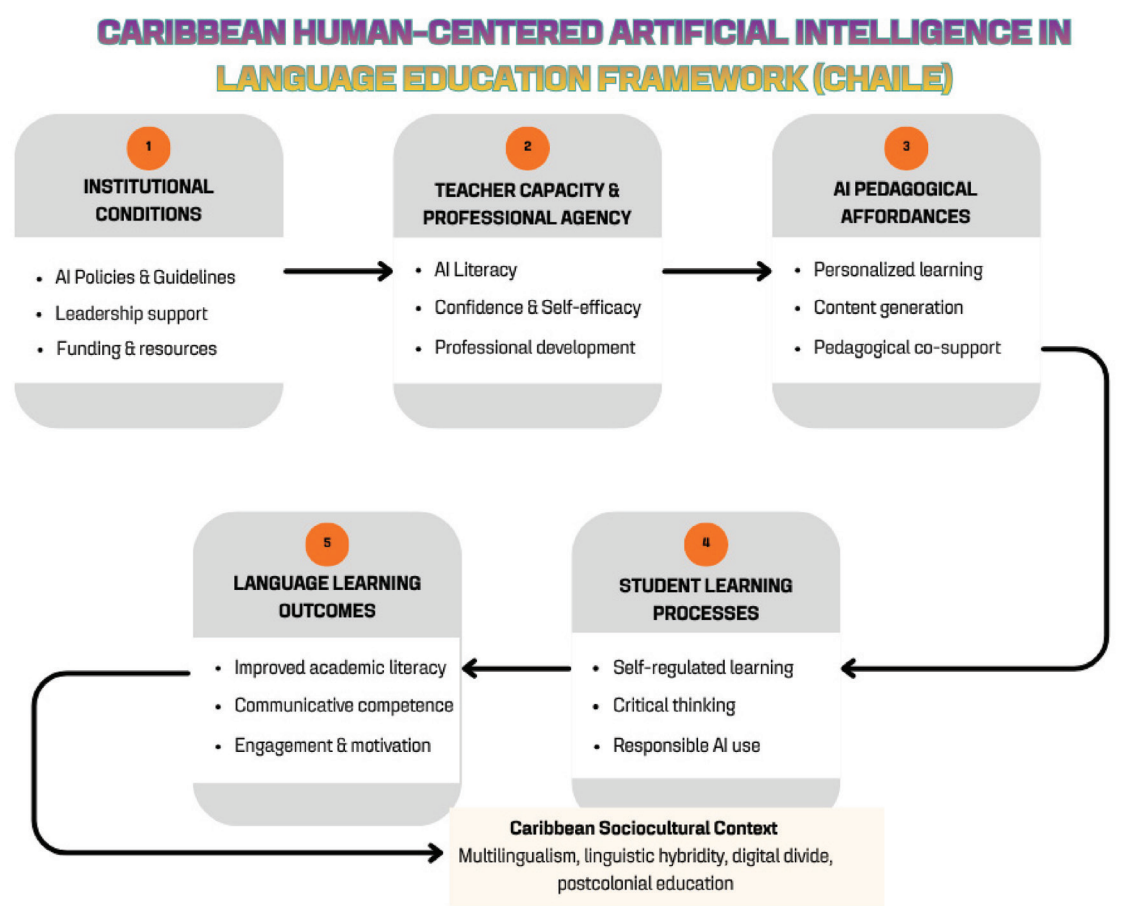


Figure 1. Caribbean human-centered artificial intelligence in language education

complementary: Carib-AIM establishes the macro-level conditions necessary for responsible and contextually relevant AI adoption, and CHAILE explicates the micro-level pedagogical processes through which these conditions foster equitable, human-oriented, and culturally responsive language learning in the age of GenAI.

To enhance its practical utility, the following examples illustrate how the CHAILE framework can guide the transparent design, implementation, and reporting of AI-supported language-learning activities. Consistent with the TEP-AIED model (Hwang et al., 2026), educators and researchers should explicitly document the GenAI applications employed, the pedagogical purposes they serve, the nature of learner interactions with the technology, the forms of teacher mediation provided, and the procedures used to evaluate both learning processes and outcomes.

For example, in an English for Academic Purposes (EAP) writing lesson, students may use ChatGPT or Gemini to generate multiple thesis statements for an essay on climate resilience in SIDS. Rather than accepting the outputs uncritically, learners could be required to compare AI-generated responses with their own ideas, identify inaccuracies or oversimplifications, and justify which thesis statement best aligns with the assignment objectives. In a foreign language classroom, learners might engage in AI-mediated conversational simulations in French or Spanish by prompting the system to act as a hotel receptionist or travel agent. Students would then analyze the authenticity of the linguistic expressions produced, adapt culturally inappropriate responses, and reflect on how the interaction supported their communicative competence.

Within CHAILE, teacher scaffolding is indispensable. Teachers are responsible for modelling effective prompt design, such as demonstrating the difference between asking an AI system to “write an essay about tourism” and prompting it to “generate three argumentative thesis statements on sustainable tourism in Jamaica, each using a different rhetorical approach.” Similarly, teachers might provide guiding questions, such as: *What assumptions does the AI make? Which ideas are missing? Does the response reflect Caribbean realities? How would you improve it?* Such scaffolding shifts learners from passive consumers of AI outputs to critical evaluators and co-constructors of knowledge.

The framework further advocates explicit procedures for evaluating AI-generated outputs. Responses should be assessed not only for grammatical accuracy but also for their depth of reasoning, cultural authenticity, linguistic appropriateness, and alignment with learning outcomes. For instance, if an AI-generated explanation of Jamaican Creole presents the language as merely “broken English,” teachers should guide learners in critiquing this representation and introducing contemporary sociolinguistic perspectives that recognize Jamaican Creole as a legitimate linguistic system. Similarly, if AI-generated examples of Caribbean culture rely on stereotypical representations, students should be encouraged to identify omissions and reconstruct more nuanced and culturally-grounded responses.

CHAILE also foregrounds strategies for mitigating potential risks associated with AI integration. Hallucinations can be addressed by requiring learners to verify AI-generated information against academic sources and justify the credibility of the evidence they use. Algorithmic bias can be interrogated by comparing AI responses concerning Caribbean languages and cultures with local scholarly perspectives and lived experiences. Privacy concerns may be reduced through institutional guidelines that discourage the input of personally identifiable information and encourage the use of institutionally approved AI platforms. Finally, the framework addresses cognitive offloading by incorporating reflective activities, such as learning journals and AI-use declarations, in which students explicitly explain what intellectual work was completed independently, what assistance was obtained from AI, and how they evaluated and adapted the outputs, as noted by Duc (2026).

By specifying the tools employed, the tasks undertaken, the nature of teacher mediation, the evaluation criteria, and the management of ethical risks, CHAILE operationalizes the principles of transparency, ethics, and pedagogy advocated by the TEP-AIED model. In doing so, it provides teachers, researchers, and policymakers with a concrete and context-sensitive framework for designing, implementing, and reporting human-driven AI-mediated language learning in Caribbean educational settings.

Strategies for Effective AI Adoption in Caribbean Language Education

Although AI presents significant opportunities for transforming language education in the Caribbean, its benefits will not be realized through technological access alone. Meaningful integration requires deliberate investments in teacher preparation, institutional capacity, culturally responsive innovation, and critical AI literacy. In light of the region's shared challenges and diverse educational realities, the following strategies are proposed to guide the development of a sustainable and people-centered AI ecosystem for language education in the Caribbean.

Integrate AI Education into Teacher Preparation Programs

The effective integration of AI in language education begins with teacher preparation. Teacher-education programs across the Caribbean should move beyond treating AI as an emerging trend and instead incorporate dedicated courses on AIED. Such courses should introduce pre-service teachers to the pedagogical, ethical, and sociocultural dimensions of AI integration, including AI literacy, responsible and ethical use, assessment redesign, academic integrity, bias detection, and culturally responsive applications of AI. Future language teachers should graduate with both the technical competence and critical dispositions necessary to evaluate and use AI as a pedagogical partner rather than as a replacement for professional judgment. Embedding AI education within teacher preparation programs would also reduce the current reliance on self-directed learning and better position educators to navigate rapidly evolving technological landscapes.

Provide Continuous Professional Development for In-Service Teachers

Given the pace at which AI technologies are evolving, one-off training initiatives are unlikely to be sufficient. Ministries of education, universities, teacher-training institutions, and professional language teacher associations should therefore establish sustained and iterative professional development programs that enable in-service teachers to continually update their AI-related competencies. Training should extend beyond basic tool familiarization to include practical applications such as prompt engineering, evaluating AI-generated outputs, identifying inaccuracies and biases, designing AI-enhanced assessments, and integrating AI into communicative and task-based language instruction. Importantly, professional development initiatives should foster communities of practice where teachers collaboratively experiment with AI tools, share experiences, and collectively develop locally-appropriate pedagogical strategies.

Move Beyond Tool Exploration to Meaningful Pedagogical Integration

Much of the current discourse on AIED remains focused on introducing and exploring available technologies. However, effective adoption requires a shift from technological curiosity to pedagogical implementation. Language classrooms should become sites of critical experimentation where GenAI tools are intentionally integrated into teaching and learning activities, and their outputs are systematically compared with human evaluation and judgment. For example, students might compare AI-generated essays with human-written texts, critique AI-produced translations, or evaluate the quality of automated feedback against teacher

feedback. Such activities encourage learners to recognize both the strengths and limitations of AI while simultaneously preserving the centrality of human reasoning, critical analysis, and disciplinary expertise. In this way, AI becomes an object of inquiry as well as a learning support tool.

Develop Interdisciplinary Programs in Computational Linguistics and Educational AI

The emergence of AI-mediated language education necessitates new forms of interdisciplinary expertise. At present, many linguists and computer scientists in the Caribbean frequently operate within separate disciplinary silos despite their increasing interdependence in AI development and language technologies. Caribbean universities should therefore establish programs and research centers in computational linguistics, educational technology, and language technologies that facilitate collaboration among linguists, educators, computer scientists, and data scientists. Such programs would contribute to the development of regional expertise in natural language processing, machine translation, speech technologies, corpus linguistics, and educational AI applications. Equally important, they would create opportunities for Caribbean scholars to actively shape AI innovations rather than remaining primarily consumers of technologies developed elsewhere.

Develop AI Systems That Reflect Caribbean Linguistic and Cultural Realities

Most commercially available AI systems are trained predominantly on global datasets that inadequately represent Caribbean languages, dialects, and sociocultural realities. Consequently, AI outputs often privilege standardized language forms and overlook local varieties, cultural references, and communicative norms. Governments, universities, and technology stakeholders should therefore invest in the development of Caribbean-centered AI systems trained on local corpora, including Caribbean Englishes, creoles, folklore, oral traditions, and culturally embedded communicative practices. Such systems could support culturally responsive language teaching while simultaneously preserving and promoting linguistic diversity. Moreover, these technologies could facilitate innovative pedagogical practices through culturally relevant simulations, conversational agents, storytelling applications, and gamified language learning experiences that resonate more meaningfully with Caribbean learners.

Promote Critical AI Literacy to Prevent Overreliance and Cognitive Dependency

Perhaps the most important strategy is the deliberate cultivation of critical AI literacy among learners. As AI tools become increasingly sophisticated and accessible, there is a growing risk that learners may rely excessively on automated systems for thinking, writing, and problem-solving, thereby diminishing opportunities for cognitive engagement and independent learning. Language education should therefore explicitly teach students how AI systems function, their limitations, biases, and ethical implications, and when and how AI should be used appropriately. Learners should be encouraged to interrogate AI-generated outputs, verify information, identify inaccuracies, and critically evaluate the appropriateness of AI responses within particular linguistic and cultural contexts. Such instruction promotes metacognitive awareness, self-regulated learning, and epistemic responsibility while reducing the likelihood of cognitive laziness and uncritical acceptance of AI-generated content. Ultimately, critical AI literacy shifts learners from being passive consumers of AI outputs to becoming reflective and discerning users who retain intellectual ownership of their learning processes.

Collectively, these strategies suggest that effective AI adoption in Caribbean language education requires a holistic and human-focused approach that simultaneously addresses teacher preparation, institutional capacity-building, pedagogical innovation, interdisciplinary collabo-

ration, cultural representation, and learner empowerment. The success of AI integration will therefore depend not simply on access to technological tools but on the region's ability to cultivate the knowledge, structures, and critical dispositions necessary to use AI in ways that are educationally purposeful, ethically responsible, and culturally authentic.

The following are some complementary strategies to address infrastructure, research, and equity concerns.

Invest in Digital Infrastructure and Equitable Access

AI integration cannot occur effectively in environments characterized by digital inequities. Significant disparities persist across the Caribbean regarding internet connectivity, device availability, and access to premium AI technologies. Consequently, governments and educational institutions should invest in reliable technological infrastructure and ensure that both educators and students have equitable access to AI-enabled learning environments. Without addressing these structural barriers, AI risks exacerbating existing educational inequalities and creating new forms of digital exclusion.

Foster Regional Collaboration and Resource Sharing

Given the relatively small size of many Caribbean educational systems, regional collaboration represents an efficient and sustainable strategy. Universities, ministries of education, and professional organizations could collaborate to develop shared AI policies, professional development programs, open educational resources, and Caribbean language corpora. Regional networks would also facilitate knowledge exchange and reduce duplication of effort while promoting contextually relevant solutions tailored to the region's shared educational and sociolinguistic realities.

Promote Research and Evidence-Based AI Integration

The Caribbean remains underrepresented in the global AIED literature. Consequently, universities should establish research agendas that investigate the pedagogical, linguistic, ethical, and sociocultural implications of AI integration within local contexts. Longitudinal, mixed-methods, and comparative studies are particularly needed to examine the long-term effects of AI on language acquisition, teacher agency, academic integrity, and learner outcomes. Evidence-based policymaking will ensure that AI initiatives are informed by regional realities rather than imported assumptions.

Together, these recommendations suggest that effective AI integration in Caribbean language education should be approached as a user-centered and multidimensional endeavor grounded in four interconnected priorities. First, capacity building is essential and requires strengthening both pre-service and in-service teacher preparation through sustained AI education and professional development. Second, infrastructure and equity must be addressed to ensure reliable technological resources and equitable access to AI-enabled learning opportunities across diverse educational contexts. Third, pedagogical transformation calls for moving beyond mere tool exploration toward meaningful classroom integration through assessment redesign, critical AI literacy, and human–AI partnership pedagogies that preserve human judgment and intellectual ownership. Finally, regional innovation and sustainability necessitate the development of Caribbean-centered AI systems, interdisciplinary collaboration, and context-sensitive research that reflect the region's linguistic diversity, cultural realities, and educational needs. Together, these priorities position AI adoption not simply as a technological initiative but as a culturally responsive and pedagogically transformative agenda for Caribbean language education.

Future Research

Consistent with calls in AIED scholarship to move beyond descriptive accounts of technology adoption and toward theory-driven investigations of learning processes, pedagogical design, and human–AI interaction (Hwang et al., 2020), future research in Caribbean language education should be organized around several interrelated research priorities.

First, research is needed on *AI, multilingualism, and culturally responsive pedagogy*. Studies should examine how AI systems process Caribbean Englishes, creoles, and other regional languages, and how AI-mediated instruction can support culturally relevant learning experiences. Theoretically, this agenda could be informed by sociocultural and culturally responsive pedagogical perspectives by investigating how AI mediates language learning in multilingual environments and influences linguistic identities and attitudes. Mixed-methods and design-based research could evaluate outcomes such as linguistic accuracy, cultural representation, learner engagement, and language attitudes.

Second, future studies should focus on *teacher capacity and professional agency in AI-enhanced language education*. Drawing on teacher-agency and technological pedagogical knowledge frameworks, research should examine how educators develop AI literacy, negotiate professional identities, and exercise pedagogical judgment when integrating AI into instruction. Longitudinal and phenomenological designs would be particularly valuable for examining changes in teacher confidence, instructional practices, and perceptions of professional autonomy over time.

Third, there is an urgent need to investigate *learner cognition, critical AI literacy, and academic writing development*. Guided by self-regulated learning theory, metacognitive perspectives, and cognitive load theory, studies should examine how learners evaluate, question, and regulate their use of AI tools and whether AI supports or constrains the development of writing proficiency, critical thinking, and metacognitive awareness. Experimental, quasi-experimental, and longitudinal studies could measure outcomes such as writing quality, critical engagement, self-regulatory behaviors, and cognitive dependence.

Fourth, research should explore *assessment redesign and human–AI partnerships in language learning*. Building on theories of distributed cognition and user-centered AI, future studies should investigate the conditions under which AI functions as a cognitive and pedagogical partner rather than a substitute for human reasoning. Design-based and intervention studies could evaluate alternative assessment models, including process-oriented, reflective, and authentic assessments, and examine their effects on learner agency, epistemic responsibility, and higher-order thinking.

Finally, there is a need to investigate *educational equity and the development of regionally-informed AI ecosystems*. Research should examine how infrastructural disparities influence access to AI technologies and whether AI mitigates or reproduces educational inequalities. Concurrently, interdisciplinary studies involving linguists, educators, and computer scientists should focus on developing Caribbean language corpora, natural language processing systems, and culturally responsive educational applications. Such work would contribute to measurable outcomes related to digital inclusion, contextual relevance, linguistic representation, and sustainable AI adoption.

Collectively, these research prospects would extend contemporary AIED scholarship by examining not only whether AI improves learning outcomes, but also how learners and teachers interact with AI systems, how AI-mediated pedagogies are designed and implemented, and under what sociocultural conditions AI can support equitable, human-driven, and educationally grounded language education in the Caribbean.

Conclusion

Artificial Intelligence has the potential to significantly transform language education in the Caribbean by enhancing instructional innovation, personalizing learning experiences, and expanding access to linguistic resources. However, the region's multilingual ecologies, Creolophone identities, infrastructural disparities, and uneven institutional readiness mean that AI adoption cannot simply replicate models developed elsewhere. Rather, effective integration requires a distinctly Caribbean, user-led approach that places pedagogical purpose, cultural authenticity, and human agency at the center of technological innovation.

Building on the Caribbean Contextualized Artificial Intelligence-Mediated (Carib-AIM) Framework, the proposed Caribbean Human-Centered Artificial Intelligence in Language Education (CHAILE) framework advances this agenda by conceptualizing AI integration as a dynamic interaction among teacher capacity, institutional support, pedagogical affordances, learner engagement, and contextually relevant outcomes. The framework therefore shifts the discourse beyond technological adoption toward the deliberate cultivation of equitable, culturally responsive, and instructionally effective AI ecosystems.

The implications are substantial. For teacher education, there is a need to develop AI-literate educators who can critically and creatively mediate AI use. For institutions and policymakers, investment is required in infrastructure, professional development, and context-sensitive strategies that reduce inequalities and promote responsible AI integration. For researchers, the article identifies an urgent need for Caribbean-centered investigations into multilingual AI systems, culturally responsive pedagogies, critical AI literacy, and the long-term effects of human–AI partnerships on language teaching and learning.

Ultimately, the future of AI in Caribbean language education will depend not on the sophistication of the technologies themselves but on the region's capacity to harness these tools in ways that preserve linguistic diversity, strengthen human cognition, and advance inclusive and transformative educational practices.

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