

Redefining Accessibility in English Language Teaching through Artificial Intelligence

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Abstract

The integration of Artificial Intelligence (AI) into English Language Teaching (ELT) marks a paradigmatic shift from one-size-fits-all pedagogy to dynamically responsive learning environments. This theoretical paper explores the affordances and limitations of AI in fostering inclusive and accessible ELT for heterogeneous classrooms characterized by diverse linguistic, cultural, and educational backgrounds. Drawing on sociocultural theory and universal design for learning (UDL), the paper argues that AI tools—including text-to-speech (TTS), speech-to-text (STT), adaptive learning algorithms, and intelligent tutoring systems can personalize instruction, bridge communication gaps, and support learners with disabilities. But, authentic social interaction, cultural nuance, and emotional encouragement essential for language acquisition are risks of over-reliance on AI being diminished. A complementary model is proposed by the paper wherein teacher agency is augmented rather than replaced by AI. Key theoretical gaps are identified, including insufficient attention being given to AI's role in preserving cultural context and the lack of frameworks for collaboration between teachers and AI. The research questions are examined to see how inclusion can be promoted by AI without compromising communicative authenticity. Expected outcomes include a theoretical taxonomy of AI applications for accessibility and a set of pedagogical principles for balanced integration. It is concluded by the paper that inclusive ELT with AI is most effective when individualization and feedback are managed by technology, while mentorship, cultural mediation, and affective support are retained by teachers.

Keywords: Artificial Intelligence, heterogeneous classroom, cultural context, TTS, STT, inclusive ELT, adaptive learning, teacher agency, universal design for learning, human-AI collaboration.

The contemporary English language classroom is increasingly heterogeneous, encompassing learners with varying proficiency levels, learning styles, sensory or cognitive disabilities, and distinct cultural-linguistic backgrounds. This diversity is often struggled with by traditional pedagogies, leading to the marginalisation of slower learners, advanced learners left unchallenged, and barriers to participation faced by students with disabilities. As a transformative force in education, Artificial Intelligence (AI) has emerged, offering unprecedented opportunities for English Language Teaching (ELT) to be redesigned as an inclusive and accessible practice. Unlike earlier computer-assisted language learning (CALL) systems that were followed by rigid, linear pathways, AI-driven tools can be adapted in real time to individual learner performance, preferences, and needs. Personalised scaffolding that was previously impossible in large classrooms is enabled by speech recognition, automated translation, intelligent tutoring, and learning analytics. For learners with visual impairments, written text is converted into audible output by Text-to-Speech (TTS); for hearing-impaired students, spoken language is transcribed into written form by Speech-to-Text (STT). Lesson difficulty is modified by adaptive learning algorithms based on ongoing assessment, ensuring that each student operates within their zone of proximal development.

Yet, legitimate concerns are accompanied by this technological promise. Language learning is fundamentally viewed as a social, communicative, and culturally embedded process. The affective dimensions of human interaction empathy, humour, shared cultural references, or the spontaneous negotiation of meaning cannot be replicated by AI, despite its computational power. A risk is posed that learners who are technically accurate but communicatively impoverished may be produced by the over-integration of AI, lacking the pragmatic competence and cultural sensitivity required for real-world language use. This theoretical paper addresses a central tension: how can ELT practitioners harness AI's capabilities for inclusion and accessibility without sacrificing the authentic, relational core of language learning? The paper rejects both techno-determinism and techno-scepticism in favour of a complementary model. It argues that AI and teachers possess distinct, non-overlapping strengths: AI excels at personalisation, accessibility, and instantaneous feedback; teachers excel at fostering communication, providing emotional support, and mediating cultural context. Their integration, rather than substitution, defines inclusive and accessible ELT for the digital age.

Universal Design for Learning (UDL) provides a robust framework for inclusive education, advocating multiple means of engagement, representation, and action/expression

(CAST, 2018). AI aligns closely with UDL: TTS and STT offer alternative representations of content; adaptive algorithms provide varied action pathways; and intelligent tutoring systems sustain engagement through personalised challenge levels. However, UDL has been critiqued for insufficient attention to cultural diversity, a gap that becomes critical in multilingual ELT contexts. Sociocultural theory (Vygotsky, 1978) emphasises that language learning occurs through social interaction, mediated by more capable peers or teachers. AI can serve as a mediating tool but cannot replace the intersubjective space where cultural meanings are co-constructed. This theoretical tension remains underexplored: can AI-mediated personalisation coexist with socially situated learning, or do they operate in opposing paradigms?

Empirical studies have demonstrated the utility of specific AI tools. Reading comprehension for dyslexic learners and those with visual impairments is improved by TTS (Wood et al., 2018). A verbal response is enabled for learners with motor difficulties through STT rather than through typing, resulting in a reduction of extraneous cognitive load. Immediate, granular corrections on phonemes, stress, and intonation are provided by speech recognition for pronunciation feedback, as seen in tools like ELSA Speak (Liakin et al., 2017). Content difficulty is adjusted by adaptive learning platforms (e.g., Duolingo, Carnegie Speech) based on learner accuracy and response times, ensuring that challenges are encountered by advanced learners while repetition and scaffolding are received by struggling learners. Initial comprehension gaps can be bridged by AI-powered real-time translation (e.g., Microsoft Translator) in multilingual classrooms, allowing participation by learners before full proficiency in English is achieved.

A growing body of literature emphasises that AI should augment, not replace, teachers. Luckin et al. (2016) argue that AI's strength lies in handling data-intensive tasks—tracking progress, diagnosing errors, generating practice items—thereby freeing teachers to focus on relational pedagogy. In inclusive settings, teachers use AI-generated analytics to identify learning difficulties early and design targeted interventions. However, most existing models remain teacher-centred, with AI as a passive reporting tool rather than an active collaborative partner.

Despite growing interest, four significant theoretical gaps persist:

1. **Cultural context and AI:** Most AI tools are developed in Anglophone, Western contexts, embedding assumptions about communication styles, discourse norms, and

politeness strategies. How AI can be adapted to diverse cultural contexts in ELT remains undertheorised.

2. **Authentic communication versus AI mediation:** While AI can simulate conversation (e.g., chatbots), simulation is not authentic interaction. The literature lacks a theoretical distinction between communicative competence developed through human versus AI interlocutors.
3. **Teacher-AI role differentiation:** Existing frameworks describe what teachers and AI *do* but not *why* certain tasks belong to one rather than the other based on pedagogical principles. A principled model of task allocation is missing.
4. **Emotional and motivational dimensions:** AI provides corrective feedback but cannot offer encouragement, empathy, or shared joy in language discovery. How to design AI systems that support affective needs without artificial emotional mimicry is unresolved.
5. This paper addresses gaps (1), (3), and partially (2) by proposing a theoretical model based on complementary strengths.

Objectives

The primary objectives of this theoretical research are:

1. To conceptualise a complementary model of AI and teacher collaboration for inclusive and accessible ELT, specifying the distinct roles of each based on pedagogical and ethical principles.
2. To theorise how AI tools (TTS, STT, adaptive algorithms, speech recognition) can address learner diversity in heterogeneous classrooms without erasing cultural and communicative authenticity.
3. To identify the conditions under which AI-mediated instruction supports versus hinders the development of pragmatic and sociolinguistic competence.
4. To propose a set of design principles for culturally responsive AI applications in multilingual ELT contexts.
5. To articulate the limits of AI in providing emotional encouragement and authentic social interaction, thereby justifying the irreplaceable role of the human teacher.

Research Questions

Given the theoretical nature of this paper, research questions (RQs) are formulated rather than hypotheses, as hypotheses typically require empirical testing.

1. **RQ1:** How can AI tools be theoretically positioned to personalise learning pathways, provide accessibility (via TTS/STT), and deliver instant corrective feedback while preserving the teacher's role as primary mediator of communication, cultural context, and emotional support?

2. **RQ2:** What are the theoretical mechanisms through which AI might inadvertently reduce authentic communication experiences, and how can instructional design mitigate this risk?
3. **RQ3:** Under what conditions does AI-supported ELT promote independent language development, and when does it create dependency that limits learner agency?
4. **RQ4:** How can the concepts of TTS and STT be extended beyond sensory accessibility to support diverse learning styles and proficiency levels in heterogeneous classrooms?
5. **RQ5:** What pedagogical principles should govern the allocation of tasks between AI and teachers to maximise inclusivity without compromising the social foundations of language acquisition?

The central theoretical contribution of this paper is the Complementary Capacities Model (CCM) for inclusive ELT with AI. The model posits that AI and teachers possess fundamentally different but complementary capacities. Inclusion and accessibility are maximised when each operates within its domain of strength.

The model rejects either-or thinking. For a struggling learner with weak pronunciation, AI provides immediate, repeatable, non-judgmental practice. The teacher then integrates corrected pronunciation into communicative pair work, embedding technical accuracy within authentic use. For a visually impaired learner, TTS enables independent reading; the teacher provides verbal descriptions of visual cultural materials (e.g., images, gestures) that TTS cannot interpret.

Heterogeneous classrooms, mixing slow and advanced learners, different first languages, varied disabilities, present a classic dilemma: whole-class instruction fails to address individual needs, while complete individualisation is logistically impossible. AI resolves this through parallel personalised pathways. Advanced learners receive compressed reviews and challenging extensions (e.g., analysing authentic texts). Struggling learners receive additional scaffolding, reduced pace, and repeated practice. Both work simultaneously within the same classroom, with AI managing the differentiation. The teacher circulates, providing targeted human support where AI cannot—for example, explaining a culturally specific idiom that the translation tool rendered literally and nonsensically.

Speech-to-text benefits not only hearing-impaired students but also learners with auditory processing difficulties or those who organise thoughts better through writing before

speaking. Text-to-speech assists not only visually impaired learners but also beginning readers who benefit from simultaneous audio-text presentation. Thus, accessibility tools designed for specific disabilities often improve learning for all—a core UDL principle.

Merits identified in the literature (extra practice, self-paced progress, immediate corrections) are confirmed theoretically. AI's ability to provide unlimited, low-stakes practice reduces affective barriers—learners can repeat pronunciation attempts without fear of embarrassment. For slow learners, this builds mastery; for advanced learners, it provides challenge without holding them back.

Demerits require more nuanced theoretical treatment. The claim that AI “cannot fully replace natural conversation” is correct but incomplete. The deeper issue is that AI-mediated interaction, no matter how sophisticated, lacks intersubjectivity, the shared intentional awareness that characterises human communication (Tomasello, 1999). Learners may develop transactional competence (ordering food, asking directions) but struggle with interactional competence (turn-taking, humour, politeness, repairing misunderstanding). Therefore, the risk is not merely missing “authentic communication” but developing a distorted model of what language is for.

Furthermore, cultural context is not merely information but enacted values. Politeness in Japanese English, directness in German English, and indirectness in Indian English are not reducible to translation rules. Teachers mediate these differences through guided reflection, role-play, and contrastive analysis—activities currently beyond AI's capacity.

A persistent fear is that AI will deskill teachers. The CCM argues the opposite: AI increases teacher capability by removing routine, data-intensive tasks (tracking errors across 40 students, generating personalised worksheets). This allows teachers to focus on high-leverage activities: facilitating discussion, designing culturally rich tasks, providing emotional encouragement, and making holistic judgments that integrate academic, social, and affective data. The paper proposes the principle of teacher final decision authority: AI suggests learning recommendations, but teachers make final decisions. This preserves professional autonomy while leveraging AI's analytical power. For example, AI may flag a student as “at risk” based on declining accuracy. The teacher investigates further—perhaps the student is facing personal difficulties or cultural adjustment issues and decides on intervention. AI provides data; teachers provide wisdom. This theoretical paper yields the following expected outcomes:

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1. **Complementary Capacities Model (CCM):** A theoretically grounded framework specifying distinct roles for AI and teachers in inclusive ELT, applicable to curriculum design, teacher training, and AI tool development,
 2. **Taxonomy of AI Applications for Accessible ELT:** A classification of AI tools (TTS, STT, adaptive algorithms, speech recognition, real-time translation) mapped to specific learner needs (sensory disabilities, proficiency diversity, learning style variation, multilingual support),
 3. **Set of Design Principles for Culturally Responsive AI:** Principles including: (a) AI must support multiple varieties of English, not only prestige varieties; (b) translation tools should flag culturally ambiguous items for teacher mediation; (c) adaptive algorithms should include cultural background as a variable, not only linguistic accuracy,
 4. **Risk Mitigation Framework for AI-Induced Communication Loss:** Practical strategies to ensure AI-supported practice is followed by authentic human interaction, including paired conversational tasks, classroom discussions, and reflective journals comparing AI and human conversations,
 5. **Teacher Professional Development Guidelines:** Competencies teachers need to work effectively with AI, including interpreting learning analytics, selecting appropriate AI tools for specific disabilities, and maintaining cultural and affective mediation.

This paper has argued that AI offers transformative potential for inclusive and accessible English Language Teaching, but only when integrated within a human-centred, pedagogically principled framework. The Complementary Capacities Model demonstrates that AI and teachers are not competitors but collaborators, each addressing different dimensions of the learning process. AI personalises, adapts, provides accessibility via TTS and STT, and delivers instant corrective feedback. Teachers provide communication practice, emotional encouragement, cultural context, and the irreplaceable intersubjectivity of human interaction. In heterogeneous classrooms marked by diverse proficiencies, learning styles, disabilities, and cultural backgrounds, this collaboration is not optional but essential. AI manages individual differences at scale; teachers ensure that individualisation does not become isolation. The paper has identified critical theoretical gaps, particularly the underexplored relationship between AI and cultural context, and has proposed research questions to guide future inquiry. The most effective model is not AI-led or teacher-led but AI-supported, teacher-mediated. AI makes learning possible for every student; teachers make learning meaningful. Together, they create English language education that is not only

inclusive and accessible but also deeply communicative, culturally rich, and profoundly human.

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