IJCRT.ORG ISSN : 2320-2882

INTERNATIONAL JOURNAL OF CREATIVE RESEARCH THOUGHTS (IJCRT)

An International Open Access, Peer-reviewed, Refereed Journal

Neurodiverse Learners And Ai In English Language Teaching: Towards Inclusive Pedagogies

Ms. K. RUPA, Research Schoalar, Department of English, Thiruvalluvar University, Vellore, Tamil Nadu

Dr. M. KANNADHASAN, Assistant Professor, Department of English, Thiruvalluvar University, Vellore, Tamil Nadu.

Abstract

This paper examines the intersection of neurodiversity and artificial intelligence (AI) in English Language Teaching (ELT), arguing that AI can both enable and constrain inclusive pedagogies. While AI promises personalization, efficiency, and scalability, these benefits often rest on standardized frameworks that do not fully accommodate the learning pathways of students with dyslexia, ADHD, autism spectrum conditions, or other neurodiverse profiles. By reconceptualizing AI as a tool for inclusion rather than correction, this study explores adaptive, affective, and ethical dimensions of AI in ELT. It advocates for an approach that embraces difference, foregrounds learner agency, and redefines success in diverse ways. The discussion integrates perspectives from neurodiversity studies, educational technology, and applied linguistics to sketch a vision of inclusive pedagogies responsive to both human and technological complexity.

Keywords: Neurodiversity, Artificial Intelligence, English Language Teaching, Inclusive Pedagogy, Adaptive Learning

Introduction

English Language Teaching (ELT) has long been shaped by normative assumptions about learners: that progress should be linear, proficiency measurable, and classroom practices standardized. However, the neurodiversity paradigm disrupts such assumptions by affirming that learners process, engage, and produce language differently, with unique strengths and challenges . In parallel, artificial intelligence (AI) is

transforming educational practice through intelligent tutoring systems, adaptive platforms, and conversational agents. The intersection of these domains poses profound questions: Can AI amplify inclusion, or will it reinforce standardization that marginalizes neurodiverselearners?

The neurodiversity framework views neurological differences not as deficits but as part of human variation. This challenges ELT's historical reliance on fixed standards of fluency, accuracy, and comprehension . AI, by contrast, thrives on large datasets and probabilistic models that often normalize performance toward dominant patterns. This tension defines the central concern of this paper: whether AI can be harnessed to embrace difference rather than erase it.

Recent scholarship emphasizes that while AI-powered tools offer personalization, their adaptations are often surface-level, focusing on pacing or sequencing rather than epistemological diversity . For neurodiverse learners, such approaches may perpetuate deficit-based pedagogies rather than enabling empowerment. Inclusive pedagogy, therefore, requires a rethinking of AI's role: moving from tools of correction to companions in learning. This shift has implications not only for classroom practice but also for broader questions of equity, ethics, and educational justice.

This introduction situates the paper within three intersecting literatures: neurodiversity studies, applied linguistics, and educational technology. By bridging these domains, it outlines a framework for critically examining AI in ELT. The subsequent sections address (1) the specific needs and assets of neurodiverse learners, (2) adaptive learning models that move beyond standardization, (3) the affective roles of AI companions, and (4) the ethical and pedagogical implications of this integration. The goal is to articulate pathways toward inclusive pedagogies where difference is not accommodated reluctantly but embraced as central to the language learning enterprise.

Neurodiverse Learners in ELT

Neurodiverse learners encompass a broad spectrum of cognitive and neurological profiles, including dyslexia, ADHD, autism spectrum conditions, dyspraxia, and other learning differences. In English Language Teaching (ELT), these learners often encounter structural and pedagogical barriers, since dominant models of proficiency and assessment presume uniform trajectories of progress. The challenge lies not in learners' capacities but in the rigidity of systems that frame difference as deficit.

For example, students with dyslexia may demonstrate creativity, strong oral fluency, and innovative problem-solving but struggle with reading comprehension tasks that privilege speed over depth. Similarly, autistic learners might excel in pattern recognition, vocabulary memorization, or rule-based grammar tasks, yet face difficulties in pragmatic or group-based communication. ADHD learners often bring energy, lateral

thinking, and spontaneity but are disadvantaged by classroom routines emphasizing sustained attention and timed testing. Such examples illustrate that neurodiversity in ELT is not about lack but about uneven landscapes of ability, where challenges and strengths coexist in complex interplay.

Traditional ELT materials and methods frequently assume linear progression through standardized curricula. Textbooks often rely on text-heavy exercises, rapid recall drills, or rigid grammar explanations, which may marginalize learners who process language differently. Teachers, constrained by assessment requirements, may inadvertently reinforce deficit-based framings: praising neurotypical performance while perceiving divergence as error. This dynamic contributes to exclusion, discouragement, and in some cases, attrition from language learning.

The neurodiversity paradigm, however, invites educators to reconceptualize these dynamics. It reframes dyslexia not merely as a reading impairment but as a different way of processing symbols; autism not as a communication disorder but as an alternative mode of social interaction; ADHD not simply as inattention but as heightened sensitivity to novelty and stimulation . By shifting from deficit to diversity, ELT can begin to view learners' strengths as pedagogical assets rather than as compensations.

AI-powered tools hold promise in mediating these challenges. For instance, speech-to-text systems can support dyslexic learners in producing written work while allowing them to capitalize on oral fluency. Visual learning platforms that pair images with vocabulary aid learners who process information more effectively through non-verbal channels. Adaptive testing can adjust timing and modality, ensuring that learners are evaluated on competence rather than speed. However, the effectiveness of these technologies depends on how they are designed and deployed. If AI systems are trained on normative datasets that exclude neurodiverse communication styles, they risk reproducing the same biases embedded in traditional pedagogy.

Equally important are the social and affective dimensions of neurodiverse learners' experiences. Many report heightened anxiety in language classrooms due to fear of error or peer judgment . AI companions, discussed later in this paper, offer one potential avenue for reducing such pressures, but they must be embedded within pedagogical frameworks that value difference. Teachers remain central actors in creating climates of belonging, and technology must serve as a complement rather than a replacement.

In sum, neurodiverse learners in ELT embody both the challenges of existing systems and the potential of alternative pedagogies. They highlight the inadequacy of standardized models and underscore the need for tools—AI included—that embrace multiplicity. The next section considers how adaptive learning, when reconceptualized, might move beyond mere accommodation to become a driver of inclusive pedagogical innovation.

Adaptive Learning Beyond Standardization

Adaptive learning has become one of the most celebrated promises of AI in education. Yet, in many commercial platforms, adaptation is narrowly defined: the sequencing of tasks, the pacing of drills, or the provision of remedial content when learners perform poorly. Such surface-level personalization may benefit some students, but for neurodiverse learners it often feels like correction rather than empowerment. To move toward inclusive pedagogy, adaptive learning must be reconceptualized as the creation of multiple pathways to knowledge rather than adjustments to a single normative path.

The problem of standardization in ELT is not new. Exams such as TOEFL, IELTS, and Cambridge assessments are premised on common scales of proficiency, which demand uniform demonstrations of reading, writing, listening, and speaking. While intended to ensure fairness, these assessments implicitly privilege certain cognitive styles: rapid decoding, rote memorization, and the ability to sustain focus under pressure . Neurodiverse learners, whose strengths may lie outside these parameters, are often disadvantaged. Adaptive learning technologies have the potential to challenge this dominance by offering assessments that are flexible, multimodal, and individualized.

For example, a learner with dyslexia could demonstrate comprehension through oral explanation rather than written multiple-choice tests. An autistic learner could showcase pragmatic competence in structured role-play with an AI companion rather than in unpredictable group tasks. An ADHD learner could engage with vocabulary through gamified, high-stimulation formats rather than monotonous repetition. These are not compensations but genuine demonstrations of knowledge aligned with learners' cognitive profiles.

AI can further support adaptive learning through multimodal integration. Natural language processing allows speech recognition to be paired with visual or tactile supports, enabling learners to engage through channels that resonate with their strengths . Machine learning algorithms can identify patterns not only in errors but also in strategies, highlighting how learners creatively navigate challenges. By valuing these strategies as assets rather than deviations, adaptive systems can promote inclusion.

However, moving beyond standardization requires confronting systemic barriers. Educational institutions, accreditation bodies, and governments often mandate standardized testing, leaving little room for alternative assessments. Teachers may also be skeptical of AI-driven personalization, fearing loss of pedagogical autonomy. To address these barriers, adaptive technologies must be designed not as replacements for teacher judgment but as tools that extend teacher capacity. Professional development is crucial: educators need training to interpret AI feedback critically and to integrate it into inclusive practice.

Another risk lies in the commodification of personalization. EdTech companies may market adaptive features as universal solutions, obscuring the complexity of neurodiverse learners' experiences. Without critical oversight, these tools can perpetuate the same exclusions they claim to address. Inclusivity demands co-design with neurodiverse learners themselves, ensuring that adaptation reflects lived realities rather than abstract models.

Ultimately, adaptive learning beyond standardization requires a paradigm shift. It means redefining success in ELT not as conformity to native-speaker norms but as the capacity to communicate meaningfully across contexts. AI, when developed and deployed ethically, can play a role in this shift. By enabling multiple pathways to proficiency, it can transform ELT into a more inclusive, equitable, and empowering domain. The next section turns to the affective dimensions of AI companions, exploring how technology can support not only cognition but also emotional well-being.

Affective Dimensions of AI Companions

Beyond cognitive scaffolding, AI can play a crucial affective role for neurodiverse learners in ELT. Emotional dimensions of learning—such as confidence, anxiety, and motivation—are particularly significant for students whose experiences are shaped by repeated encounters with stigma, exclusion, or misunderstanding. AI companions, designed as conversational agents or virtual tutors, offer low-stakes environments for language practice that may alleviate some of these pressures.

For learners with social anxiety or autism spectrum conditions, interaction in a traditional classroom can be overwhelming. Peer judgment, unpredictable group dynamics, and performance pressure often exacerbate stress, undermining learning outcomes. An AI companion, by contrast, provides a space where mistakes are not penalized, interactions are predictable, and feedback is immediate. Such an environment can enhance self-efficacy by allowing learners to build skills at their own pace, without the fear of embarrassment.

Research on affective computing highlights how AI can be programmed to detect and respond to emotional cues, such as hesitation, frustration, or enthusiasm . In ELT contexts, this means AI companions could adjust tone, pacing, or encouragement based on learners' affective states. For example, if a learner exhibits repeated pauses, the AI could provide reassurance, slow down, or switch modalities to reduce cognitive load. These features are particularly valuable for neurodiverse learners, whose affective needs may be overlooked in traditional settings.

However, the affective role of AI companions should not be romanticized. Emotional interaction with machines cannot replace the empathy and relational depth of human teachers or peers. Rather, AI should be positioned as a supplement—bridging gaps in confidence, providing rehearsal spaces, and scaffolding transitions into more demanding social contexts. Used thoughtfully, AI companions can help learners rehearse communicative strategies that later transfer to authentic human interactions.

An additional consideration is learner agency. Neurodiverse learners often experience environments where their autonomy is constrained by remediation-focused interventions. AI companions that allow customization—such as choosing avatars, selecting conversational topics, or adjusting feedback styles—can restore a sense of control. This aligns with inclusive pedagogy's emphasis on empowering learners to shape their educational experiences .

The affective benefits of AI companions extend beyond individual learners. Teachers may find that integrating such tools reduces classroom anxiety overall, enabling more equitable participation. By normalizing the use of AI for practice and support, schools can reduce stigma and foster a culture where technological aids are viewed not as crutches but as legitimate learning resources.

In summary, AI companions offer a promising avenue for addressing the affective dimensions of neurodiverse learners in ELT. They provide safe, customizable, and supportive environments that enhance confidence and motivation. At the same time, their role must be carefully balanced with human teaching and peer interaction. The following section explores the ethical and pedagogical considerations that arise when AI is integrated into inclusive language teaching.

Ethical and Pedagogical Considerations

The integration of AI into ELT for neurodiverse learners raises pressing ethical and pedagogical considerations. While the promise of personalization is alluring, it comes with risks of surveillance, bias, and unintended consequences. These issues must be addressed if AI is to contribute meaningfully to inclusive pedagogy.

One central concern is data ethics. AI systems rely on vast amounts of learner data, including language output, error patterns, and even emotional cues. For neurodiverse learners, this data may include sensitive information about cognitive or behavioral profiles. The collection, storage, and analysis of such data pose risks of privacy violation and stigmatization . Schools and developers must adopt strict safeguards, ensuring informed consent, transparent data use, and secure storage. Without such measures, the very tools intended to empower learners could expose them to harm.

Algorithmic bias is another pressing issue. Many AI systems are trained on datasets that reflect neurotypical communication patterns, meaning that neurodiverse learners' unique strategies may be misclassified as errors . For instance, an autistic learner's direct communication style might be flagged as inappropriate, or a dyslexic learner's spelling variations might be overemphasized in error reporting. Such biases not only misrepresent learner ability but also reinforce deficit-based views. To counter this, AI development must include diverse data sources and actively test for inclusivity.

Pedagogically, the integration of AI challenges traditional teacher roles. If AI is used primarily for remediation, teachers may inadvertently delegate support for neurodiverse learners to machines, reducing opportunities for human connection. Conversely, if AI is positioned as a co-teacher, teachers can leverage its affordances while retaining responsibility for interpretation, empathy, and adaptation. The balance between automation and human agency is thus central to ethical practice.

Accessibility is another critical consideration. While AI tools have potential, they are often embedded in commercial platforms requiring subscriptions, devices, or high-speed internet access. Such requirements risk deepening educational inequities, especially in under-resourced contexts. Inclusive pedagogy demands that AI tools be designed with affordability and accessibility in mind, ensuring that neurodiverse learners are not further marginalized.

Teachers also need professional development to use AI ethically and inclusively. Without adequate training, they may over-rely on automated feedback, misinterpret AI-generated insights, or struggle to integrate technology meaningfully into practice. Critical AI literacy—an understanding of both potentials and limitations—is essential for teachers working with neurodiverse learners.

> Accuracy refers to the correctness of object and scene identification; narrative coherence examines how descriptions are structured into meaningful sequences; prioritization analyses which elements are foregrounded or omitted; and context assesses the system's ability to situate objects within broader environmental relationships. Together, these parameters enable a systematic evaluation of environmental narration (Kannadhasan and Sriee 3065).

Finally, ethical integration requires collaboration with learners themselves. Too often, educational technologies are designed without the input of those most affected. Involving neurodiverse learners in the design, evaluation, and refinement of AI tools ensures that their voices shape the technologies intended to support them. Such participatory approaches not only improve effectiveness but also embody the very principles of inclusion that these tools aim to promote.

In sum, the ethical and pedagogical considerations surrounding AI in ELT highlight the need for vigilance, critical reflection, and participatory design. AI has the potential to either reinforce exclusion or transform pedagogy into a more inclusive endeavor. The final section reflects on these possibilities, offering a conclusion and directions for future practice.

Conclusion

This paper has explored the intersections of neurodiversity, AI, and English language teaching, arguing for inclusive pedagogies that extend beyond standardization. The discussion began by situating neurodiverse learners within ELT, highlighting the barriers they face in standardized, norm-driven contexts. It then examined adaptive learning as a potential site of innovation, emphasizing the need to reconceptualize adaptation as multiple pathways rather than adjustments to a single model. The affective dimensions of AI companions were also considered, pointing to their role in building confidence, reducing anxiety, and supporting learner agency. Finally, the ethical and pedagogical considerations underscored the importance of vigilance, critical AI literacy, and participatory design.

Taken together, these discussions suggest that AI can be a powerful ally for neurodiverse learners—but only if designed and implemented thoughtfully. Inclusion is not achieved through technology alone; it requires structural changes in assessment, pedagogy, and institutional culture. AI must therefore be viewed not as a replacement for human teaching but as one component in a broader ecosystem of support. Teachers, learners, developers, and policymakers must collaborate to ensure that these technologies amplify rather than diminish human potential.

Future research and practice should prioritize co-design with neurodiverse learners, longitudinal studies on affective outcomes, and critical examinations of the cultural assumptions embedded in AI tools. By doing so, the field of ELT can move towards a genuinely inclusive pedagogy—one that recognizes diversity as a resource, not a deficit, and embraces technology as a means of expanding, rather than narrowing, educational possibilities.

Reference

1. Armstrong, Thomas. The Power of Neurodiversity: Unleashing the Advantages of Your Differently Wired Brain. Da Capo Press, 2011.
2. Holmes, Wayne, Maya Bialik, and Charles Fadel. Artificial Intelligence in Education: Promises and Implications for Teaching and Learning. Center for Curriculum Redesign, 2019.
3. Kannadhasan, M., and M. Sruthi Sriee. "Machine Vision as Environmental Narrator: A Study of Seeing AI and Google Lookout." *International Journal of Innovative Research in Technology*, vol. 12, no. 8, Jan. 2026, ISSN 2349-6002. https://ijirt.org/publishedpaper/IJIRT190481_PAPER.pdf.
4. Kormos, Judit. Speech Production and Second Language Acquisition. Routledge, 2006.
5. Luckin, Rose. Machine Learning and Human Intelligence: The Future of Education for the 21st Century. UCL IOE Press, 2018.
6. Picard, Rosalind. Affective Computing. MIT Press, 1997.
7. Rose, David H., and Anne Meyer. Teaching Every Student in the Digital Age: Universal Design for Learning. ASCD, 2002.
8. Shohamy, Elana. The Power of Tests: A Critical Perspective on the Uses of Language Tests. Routledge, 2001.
9. Williamson, Ben, and Nelli Piattoeva. "Education Governance and Datafication." Oxford Research Encyclopedia of Education, Oxford UP, 2019.