frontiers | Frontiers in Education

TYPE Editorial
PUBLISHED 12 January 2026
DOI 10.3389/feduc.2025.1765687

OPEN ACCESS

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RECEIVED 11 December 2025
REVISED 11 December 2025
ACCEPTED 16 December 2025
PUBLISHED 12 January 2026

CITATION
Eradze M, Manna M, Sunar A, Dovigo F and Ianes D (2026) Editorial: Harnessing generative AI for inclusive education: opportunities and challenges. *Front. Educ.* 10:1765687. doi: 10.3389/feduc.2025.1765687

Editorial: Harnessing generative AI for inclusive education: opportunities and challenges

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KEYWORDS

Generative Artificial Intelligence (GenAI), inclusive education, language learning, pragmatics, teacher education

Editorial on the Research Topic
Harnessing generative AI for inclusive education: opportunities and challenges

Introduction

As we navigate the rapidly evolving landscape of Generative Artificial Intelligence (GenAI), the integration of GenAI into education has shifted decisively from speculative disruption to operational reality. Yet this integration remains uneven, often deepening the very inequities it promised to address, which is a reality increasingly documented in comparative studies across global contexts. The research in this Research Topic interrogates a central paradox: Can technologies built on statistical normalization and English-centric data truly serve learners who exist, by definition, outside the norm?

The perception gap: a crisis of trust

A striking theme across the contributing research is the persistent perception gap between educators and students; a gap that extends far beyond different adoption rates to reveal a fundamental divergence in how these stakeholders understand AI's ethical and pedagogical implications.

In research conducted at a Peruvian university by Reina Marín et al. stark contrasts emerged: 73.1% of faculty expressed doubt regarding AI's effectiveness in teaching, and 65.9% evaluated its overall learning impact unfavorably. In sharp contrast, 84% of students reported high confidence in the ethical handling of data by these same tools. This gap creates what we might call a "shadow curriculum," in which students engage with AI covertly, often bypassing faculty guidance entirely. This dynamic is particularly problematic in inclusive education, where students with disabilities depend on faculty advocacy and informed guidance. When educators view AI primarily as a threat to academic integrity rather than as a pedagogically grounded assistive tool, they abdicate their responsibility to model the critical literacies that learners need to engage with these technologies safely and effectively.

This disconnect persists strikingly among pre-service teachers, i.e., the very professionals who will shape educational practices in coming years. Research with pre-service teachers at the University of Latvia by Kaliņina et al. revealed a troubling paradox: while 75% recognized that AI could meaningfully support students navigating language barriers, only a minority had translated this theoretical recognition into practice. Fewer than half reported using AI tools in their own studies, and only about a quarter had engaged with ChatGPT. Even more revealing, when pre-service teachers did use AI, roughly half engaged with it primarily "to have a friendly chat," suggesting that for many emerging educators, the perceived value of AI lies as much in social-emotional companionship as in cognitive or pedagogical support. This gap between belief and practice underscores a critical need: professional preparation programmes must bridge theory and lived experience, helping future educators develop not just awareness of AI's potential but genuine literacies and competencies in its pedagogical deployment.

The curious case of pragmatics: algorithmic normalization

Perhaps the most profound challenge to inclusion is the epistemological structure of Large Language Models (LLMs) themselves. In "*How inclusive large language models can be? The curious case of pragmatics*," Manna et al. argue that LLMs, by design, favor "standard" language use. These probabilistic engines predict the next most likely token, effectively flattening linguistic diversity.

For neurodivergent students, particularly those with autism who may employ non-standard pragmatics, irony, or unique socio-linguistic scripts, this normalization is exclusionary. If an AI "corrects" a student's unique voice to match a corporate or academic standard, it performs a type of erasure, reinforcing a "normative" way of thinking and communicating.

True inclusion in an AI-mediated educational landscape requires not tools that enforce homogeneity, but systems designed to recognize, respect, and translate across diverse pragmatic and linguistic repertoires. This is not a minor technical refinement but it is a fundamental ethical imperative for the field.

Redefining pedagogy: process over product

Gogh and Kovari's contribution, "*Homework in the AI era: cheating, challenge, or change?*", dismantles the traditional "product-oriented" assessment model. They argue that if an assignment can be fully automated by a chatbot, the flaw lies in the assignment, not the student. If the tools are bringing down the walls of traditional assessment, the pedagogy must shift.

For students with Special Educational Needs and Disabilities (SEND), the shift must be toward process and metacognition. The authors propose a "dialogic" approach where students might use AI to generate a solution and then critique it, or use tools like Wolfram Alpha to verify manual work. This shifts the assessment from the final output, which can be hampered by dysgraphia or processing speed issues, to the student's reasoning and critique.

Simultaneously, the systematic review by Mukhtarkyzy et al. reminds us that "inclusive AI" is often synonymous with "visual AI." Their analysis of assistive technologies from 2012 to 2023 highlights Augmented Reality (AR) as a dominant tool for visualizing complex scientific concepts, particularly for students with Autism Spectrum Disorder (ASD). AR allows students to manipulate virtual objects, bypassing fine-motor constraints and providing a safe "sandbox" for experimentation.

Conclusion: toward a post-normal pedagogy

The articles in this Research Topic collectively point toward an urgent agenda: the need for pedagogically grounded, ethically-informed approaches to AI integration that center the voices and needs of historically marginalized learners. This requires moving beyond enthusiasm for technological capability toward genuine partnership between technologists, educators, and learners in shaping AI systems that enhance rather than diminish human communicative and cognitive potential.

The research collected in this Research Topic suggests that the future of inclusive education depends on a "Human-in-the-Loop" framework. We must move beyond the "medical model" of using AI to "fix" the student and toward a "social model" where AI does not increase the exclusion. This requires faculty to bridge the perception gap, designers to address algorithmic bias, and policymakers to ensure that the "efficiency" of AI does not automate away the humanity of care. As we look toward the future, the mandate for educators is clear: we must harness Generative AI not to standardize our students, but to emancipate them.

Author contributions

ME: Supervision, Conceptualization, Writing – original draft. MM: Conceptualization, Writing – review & editing, Writing – original draft. AS: Writing – review & editing, Writing – original draft. FD: Writing – review & editing. DI: Writing – review & editing.

Funding

The author(s) declared that financial support was received for this work and/or its publication. The research has been funded by the Project PragmaLingAI: Co-Creating Educational Tools for and with GenAI to Prevent Deskilling and Support Cognitive and Linguistic Development. University of L'Aquila Competitive Grant for Fundamental Research (Grant ref: DD.RR. rep. no. 535/2025).

Conflict of interest

The author(s) declared that this work was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Generative AI statement

The author(s) declared that generative AI was used in the creation of this manuscript. Generative AI was used in copy editing.

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