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Polarisation and Potential: Reframing the Generative AI in Education Discourse

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Abstract

The rapid advancement of Generative Artificial Intelligence (GenAI) sparked both excitement and concerns in the educational community and a renewed interest in the field of Artificial Intelligence in Education (AIED). While academic discourse has acknowledged both the opportunities and challenges of AIED, recent discussions appear increasingly polarised, with stakeholders often positioning themselves either in strong support of or opposition to initiatives under the AIED umbrella. This oversimplification overlooks the critical nuance that not all concerns surrounding AIED are equivalent. For instance, the implications of using conversational agents in classroom settings differ significantly from those of intelligent systems that sequence learning materials or analyse learner data to support pedagogical decisions. Without such nuance, the pedagogical potential of these technologies might lead to what might be described as "throwing the baby out with the bathwater." In this contribution, we synthesise some of the existing discourse across diverse contexts. Our aim is to offer a multifaceted perspective that neither dismisses legitimate concerns nor underestimates the transformative potential of AI in educational practice.

Keywords: AIED, Generative AI, opportunities, polarization, risks

Introduction

Research regarding the use of AI in education (AIED) extends over more than 50 years (McCalla, 2023) and has provided insights about the opportunities it can introduce for educational stakeholders (primarily, teachers and learners), such as promoting personalized learning meeting learners' needs and supporting teachers in delivering adaptive instruction and meaningful feedback. The rise of Generative AI (GenAI) however, appears to have triggered a renewed attention to AIED (Rismanchian & Doroudi, 2025). Apart from the surge in AIED research (Chounta et al., 2024), the past years, and in particular after the ChatGPT launch in 2022, there is increasing criticism regarding the impact of AI in education, focusing on aspects such as cognitive and social development, privacy and bias magnification (Holmes, 2024).

This growing apprehension can lead to polarization in the discourse around AIED and potentially harm education instead of safeguarding it. We acknowledge that the integration of emerging technologies in education should be justified by scientific evidence and follow a rigorous and systematic approach ensuring safety, respecting human rights and values. However, discouraging the adoption of such emerging technologies could introduce other risks, such as formal education being perceived (or even becoming) outdated and irrelevant.

Related work

AI impacts various sectors of everyday life (e.g., healthcare) and education is no exception. AIED builds on more than 50 years of research on how computational systems can support and augment teaching and learning processes (Mavrikis et al., 2021; VanLehn, 2011). Examples of already integrated AIED systems are intelligent tutoring systems, adaptive testing platforms, chatbots and robots designed to deliver individualised instruction in terms of content and pace, reduce teacher workload on some pedagogical tasks and provide real-time feedback (Chounta et al., 2024; Topali et al., 2025). Despite AIED's long history, the recent proliferation of Generative AI (GenAI) has intensely amplified the interest in AI's role in education. Large Language models and generative content tools, especially ones without educational orientation, have captured the educators' and policy-makers' attention raising discussions about what AI can and should do in educational settings (Holmes et al., 2022).

This renewed attention has not been without controversy. GenAI has been signalled as a transformative force (Giannakos et al., 2024). However, critics caution that these tools may undermine critical thinking, and reduce human agency in teaching and learning or have negative impact on privacy and magnification of bias (Shneiderman, 2020). As a result, discourse around AIED has become increasingly polarized also reflecting in grey literature, news and opinion articles as well as in social media platforms. For example, Sullivan et al. (2023) carried out a content analysis of news and showed there are mixed positive and negative perspectives: some articles discuss opportunities for learning that GenAI has introduced while other media articles and discussions tend to focus on the potential of academic dishonesty. On the contrary, Tlili et al., (2023) conducted a multi-level analysis of social media posts to demonstrate that public discourse regarding the use of ChatGPT in education is overall positive. An internet search over the Greek online media reveals a similar picture: GenAI is perceived either as a means or opportunity to improve, speed up and promote learning, or as an instrument for creating impressions and asserting monitoring and control (Papadantonakis, 2025).

Such polarization risks oversimplifying a complex field. Empirical studies demonstrate that the effectiveness of AIED depends not on technological sophistication but mainly on thoughtful pedagogical integration and human oversight (VanLehn, 2011). Anecdotal reports from educators experimenting with GenAI further underscore that outcomes vary widely depending on factors such as teacher training, curriculum design, and students' digital literacies. These insights highlight that a nuanced and critically reflective stance is essential. This entails moving beyond binary debates to ask what specific educational challenges AI is best suited to address, how AI can augment rather than replace human relationships, and how ethical, cultural, and local considerations can inform design and implementation (Giannakos et al., 2024; Holmes et al., 2022).

Implications for theory and practice

The growing polarization in discussions about AIED poses real risks for both scholarship and practice because it may shift the focus from the more complex, evidence-informed middle ground needed to guide thoughtful adoption. The lack of robust, long-term evidence demonstrating AIED's effectiveness fuels both extremes. Public discourse revolves around the limited efficacy evidence at scale and, anecdotally, some decision makers use this argument to justify inaction or even blanket bans, rather than engaging with decades of nuanced research. This point is valid, both for uses of AIED (Chounta et al., 2024) and for research into GenAI in education that is too recent for systematic reviews to have emerged

(Weidlich, 2025). It is, thus, evident that we need to move beyond either generalised critiques on one side, or techno-solutionism on the other and instead refer to established insights in the field and build cumulative, coherent research specific to different types of AIED.

Concerns about diminished agency, both from students and from teachers' perspective further amplify polarized debates. Classic ITSs achieved strong learning gains by embedding mechanisms such as graduated fading, required student explanation, and adaptive scaffolding (VanLehn, 2011). More recently, studies show that generative AI can reduce mental effort and promote "metacognitive laziness" if not carefully integrated (Fan et al., 2025). Yet, when systems prompt reflection rather than provide answers, they can foster critical thinking and self-regulation. Rather than defaulting to restrictive policies, designers and institutions should draw on one hand on this accumulated AIED knowledge to develop tools that support, not supplant, student agency and on the other hand recognise the need for explicit guidance for students and teachers to learn how to use these tools.

Likewise, there are discussions about overly prescriptive AI systems constraining teachers' judgment and creativity. A recent systematic review (Topali et al., in press) found that AIED development and implementation often overlooks critical pedagogical considerations and teacher needs, excepting them to simply lead tools aimed to automate learning tasks and processes. Thus, while the fears of teacher replacement or threats to their expertise are legitimate, they can be mitigated by prioritizing human oversight and embedding AI tools within participatory, agency-enhancing pedagogies (Chounta et al., 2022).

Privacy, data ethics, and intellectual integrity are particularly salient when considering GenAI in education. GenAI tools often require processing large amounts of student input and can produce plausible but sometimes inaccurate or biased outputs. This raises unresolved questions about data ownership, consent, and the security of student-generated content that may be stored or reused by commercial models (Stracke et al., 2024).

Nevertheless, acknowledging these challenges should not overshadow GenAI's considerable promise when used thoughtfully and with appropriate safeguards. For instance, prior research discussed teachers' attitudes toward AI in the context of teacher-AI collaboration (Jeon & Lee, 2023), demonstrating that teachers believe that AI could support them in instructional design and delivery and lowering significantly their working load (Chounta et al., 2022; Kim & Kwon, 2023). Realizing these benefits depends on keeping human oversight central, cultivating students' critical engagement with AI outputs, and embedding these tools within transparent and equitable learning environments.

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