The Untold Story of Training Students with Generative AI: Are We Preparing Students for True Learning or Just Personalization?

Haesol Bae
University at Albany, State University of New York, USA

Aras Bozkurt
Anadolu University, Türkiye

Abstract: This special issue joins the recent but growing effort to expand understanding of integrating generative AI. While generative AI tools like ChatGPT offer great opportunities for personalized learning, it is important to think critically about what type of learning we are reinforcing through the convenience and customization offered by AI. The reliance on AI for scaffolding and personalized prompts can risk undermining students' independent thinking and problem-solving abilities. Additionally, the emphasis on personalized learning could deter the development of collaboration skills. As we continue to integrate AI into educational practices, we need to work towards balancing the benefits of personalization with the goal of fostering self-reliant, critical thinkers who can collaborate and evaluate AI generated content.

Keywords: generative AI, AI in education (AIEd), personalized learning, collaborative learning, scaffolding

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Growing up with the GenAI Baby

Generative artificial intelligence (GenAI) is actually a newborn technology that is still in its infancy. This technology will eventually start to walk, and then run, following the crawling stage (Bozkurt, 2024; Bozkurt & Bae, 2024). Unlike other technologies, it can learn, unlearn and relearn. This ability of GenAI actually points out that there are untapped areas waiting to be explored in human-machine interaction in general and human-AI interaction in particular (Akban et al., 2024; Bozkurt, 2023; Bozkurt & Sharma, 2024). One of these areas to explore is learning and teaching in the educational landscape (Tlili et al., 2023). To proactively prepare for the future, we must explore the world of GenAI and dig in deeper to use this technology responsibly, effectively, and efficiently.

Digging in Deeper: Generative AI Technology in the Educational Landscape

GenAI holds great promise for transforming how we teach and learn, praised for its ability to adapt to individual learning needs (Swindell et al., 2024). It provides an unprecedented and unique opportunity to introduce educators and learners to AI technology and its capabilities, offering personalized scaffolding and tailored teaching and learning experiences. By continuously analyzing user data, AI algorithms personalize learning paths, ensuring that each student receives content and assessments aligned with their strengths and weaknesses (Hodges & Kirschner, 2024). Another significant capability is the augmentation of feedback and assessment processes. GenAI enables automated and immediate feedback mechanisms to provide learners with quicker results related to their academic performance on assignments (Kadaruddin, 2023; Su & Yang, 2023).

These affordances collectively position GenAI as a time-saving powerful tool in shaping a more personalized, efficient, and engaging instructional experience (Bozkurt et al., 2023; Lin et al., 2024; Ruiz-Rojas et al., 2023). The goal of individualized learning is to create an environment that adapts to learners' needs through personalized feedback and contextually and competently relevant tasks. This adaptability may help to ensure that learners receive content and assessments at an appropriate difficulty level, fostering a more engaging and effective learning experience (Chan & Hu, 2023). As a result, instructional designers can leverage GenAI to build tailored learning pathways that respond to the evolving needs and progress of each learner. Moreover, GenAI can aid in assessing and refining instructional design outcomes, making the design process more iterative and responsive. This allows instructional designers to expedite decision-making and transition from design to implementation more swiftly (Salinas-Navarro et al., 2024).

However, what are we trying to achieve in student learning through the convenience and customization offered by GenAI tools? As we embrace these advancements, it is crucial to critically examine *what type of learning students are being trained with Generative AI*, considering the broader and unintended implications for their cognitive and social development.

One critical concern we argue is whether students are becoming overly reliant on these tools for deep thinking and meaningful problem-solving, which requires student-led specific and intentional pedagogies in the classroom (Glazewski & Hmelo-Silver, 2019). It is well accepted

that deep meaning-making and learner agency are crucial for effective learning and knowledge building (Hawkins, 1997). For example, problem-solving represents a student driven pedagogical approach in which students learn through solving authentic and complex problems and reflecting on their experiences (Hmelo-Silver & Barrows, 2008). It involves scaffolded inquiry where students collaboratively engage in meaningful problem-solving tasks while taking responsibility for their own learning (Bae et al., 2021). Students are expected to take an active role, engaging their agency in the pursuit of learning goals through seeking information and evaluating and negotiating decisions (Bridges et al., 2012). In this context, the personalized prompts and adaptive scaffolding provided by GenAI can potentially inhibit students' ability to think on their own and initiate and develop critical-thinking skills. When students are accustomed to AI-generated assistance at every thinking step, they might struggle to navigate problems without such support, raising the question of whether they are truly learning or merely following guided steps.

Moreover, the focus on personalized learning facilitated by GenAI tends to overshadow the importance of collaborative learning. A shift towards individual learning might hinder the development of collaborative meaning making and communication skills. During problem-solving, students often work on problems in small groups, allowing them to acquire both content knowledge and collaboration skills through joint cognitive engagement in inquiry activities, where they communicate their ideas with peers (Hmelo-Silver et al., 2007). This collaborative process is typically seen as a dialogic activity aimed at enhancing team understanding (Bereiter, 2002). Such dialogic engagement occurs when all participants are actively involved and take responsibility for their own and others' learning under the guidance of a highly skilled facilitator (Hmelo-Silver & Barrows, 2008). The facilitator guides through coaching, modeling, and offering support as needed without directly giving the correct answers (Hmelo-Silver et al., 2007). They also model the types of questions students should be asking themselves and their peers, creating a cognitive apprenticeship (Hmelo-Silver & Barrows, 2006). In this context, GenAI can be a great asset to scaffold the collaborative inquiry process if designed to support and enhance these collaborative learning experiences. By integrating GenAI tools that promote collaborative learning, critical thinking, and effective group communication, educators can ensure that students benefit from personalized learning while also acquiring essential social and cognitive skills necessary for success in both academic and professional settings. Therefore, it is critical to design GenAI tools that facilitate collaborative learning experiences and cater to individual learning progress, without isolating students or depriving them of opportunities to engage with their peers.

As a final remark, it should be noted that while GenAI can provide immediate and personalized feedback, educators and students need to critically evaluate the output of these tools, ensuring that the support provided enhances learning rather than reinforcing shallow understanding or biased perspectives that AI generated. The credibility and the quality and depth of the feedback are contingent on the data and algorithms that drive these systems. AI tools can perpetuate existing biases present in their training data and might offer superficial rather than substantive feedback (Almeida et al., 2022).

Insights and Reflections from GenAI Special Issue

The papers in this special issue offer a critical understanding of how various stakeholders (e.g., students, educators, administrators, and instructional designers) use and perceive GenAI in

their own context. The issue features one systematic review, two conceptual articles, and six empirical articles. A common theme across these nine studies includes the ethical concerns and cautious approach taken by educators and instructional designers in using and introducing GenAI along with potential opportunities and challenges in teaching and learning.

In their systematic review study, Lee & Moore synthesized ten studies from 2019 to 2023 on the use of GenAI for automated feedback in higher education, highlighting how these systems reduced instructor workload, enhanced communication, provided cognitive and emotional support, and improved accessibility. Conceptual articles featured in the special issue offer both critical and crucial perspectives. For instance, Cacho proposed balanced and flexible guidelines for incorporating GenAI into university teaching and learning. The guidelines offered faculty and students a reference for integrating AI into coursework. In their article, Stefaniak & Moore proposed a conceptual framework to help instructional designers leverage GenAI tools for inclusivity, emphasizing the need to address ethical considerations and engage in iterative design practices.

In the empirical studies, Johnson et al. revealed that most participants expected AI to significantly impact their institutions within the next five years, but many felt their institutions were unprepared for this change. Their findings highlighted concerns about academic integrity, skepticism about AI being overhyped, and feelings of uncertainty. Cheng explored the potential of ChatGPT to improve university students' English writing skills, surfacing that while students found these tools convenient, teachers were concerned about the feedback AI provides. Kemal et al. also showed the benefits of ChatGPT for language learning, particularly for writing assignments. However, they also demonstrated the challenges, such as inaccuracy, lack of critical thinking, plagiarism, and technical difficulties. Li et al. revealed that language learners in the U.S. were motivated to use ChatGPT for its flexibility and personalization. The study highlighted that learners' self-monitoring skills enhanced their efficient use of AI, offering insights for designing AI-integrated learning to support diverse needs and expand opportunities. Bae et al. found that online class discussions significantly increased pre-service teachers' awareness and foundational knowledge regarding ChatGPT while reducing their anxiety about AI. However, despite this exposure, few expressed intentions to adopt AI tools in their teaching. Kumar et al. examined the roles of instructional designers in higher education regarding the integration of GenAI into their institutions and their professional practices. The study highlighted the instructional designers' cautious and ethical approach to GenAI integration.

The articles featured in this special issue call attention to the potential benefits as well as the complexities and challenges inherent in integrating AI into educational settings. These articles may provide valuable insights into the early perceptions of GenAI integration, helping us understand how educators and researchers initially approached and adapted to these emerging technologies. By facilitating dialogue on these issues, we aim to encourage a more critical and careful understanding of how AI generally and generative AI specifically can be meaningfully integrated into teaching and learning, and to stimulate discourse on future directions that foster critical and ethical use of AI with robust pedagogical principles. In other words, we must ensure that AI serves as a learning tool or companion that enhances collaborative problem solving and knowledge building in the learning process rather than a training tool that reinforces scaffolded behavior depending on right or wrong answers.

Competing Interests

The authors have no competing interests to declare.

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