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Reflection-AI: exploring the challenges and opportunities of artificial intelligence in higher education

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A rigorous debate is underway regarding the use of artificial intelligence (AI) in higher education. Risk perceptions regarding AI range from concerns about students using AI inappropriately and unethically to teachers and teaching assistants being replaced by AI robots. This essay situates the discussion around AI historically to mitigate such fears and propose workable strategies for integrating it into the educational experience. In other words, I place AI within the frame of other new technologies that have been introduced, scrutinized, studied, and adopted throughout history (e.g., textbooks, calculators, personal computers and word processors, Internet and online learning). Ultimately, I argue that we ought to embrace the challenges posed as opportunities to again conduct theoretically driven empirical research to inform best practices for integrating AI into teaching and assessment in ways that improve learning and the environment for learning. By incorporating AI with integrity, teachers could be freed to do more deep teaching and to engage in more intellectually stimulating dialogue with students, each of which are designed to foster higher order critical thinking and analysis skills among students.

KEYWORDS

artificial intelligence, new technologies, instructional communication, risk perceptions, teaching and learning, higher education pedagogy

Introduction

Not long after Bill Gates, co-founder of the Microsoft Corporation (arguably one of the world's largest personal computer software companies), appeared on NBC's *The Tonight Show*, on February 4, 2025, his remarks about the future of artificial intelligence (AI), particularly in the fields of medicine and education, went viral. He claimed "advancements in artificial intelligence will significantly reduce humanity's role" in these two fields because great medical advice and great tutoring will become free and easily accessible (Zilber, 2025). In this essay, I call his projections into question. In fact, AI is not the first technological affordance to cause alarm and to be touted as an innovation that will ultimately replace academic experts, devastate the integrity of educational practices and systems, and destroy our capacity to think critically. I am also certain it will not be the last.

I argue in this essay that—rather than fear AI as it may take away jobs by replacing teachers—teacher-scholars ought to embrace it (as we have with other new technologies when they emerged) by focusing on strategies to employ it as a tool that augments pedagogical practices and ultimately improves learning and the environment for learning. When we employ AI and other technological affordances to perform the mundane and time-consuming tasks related to, for example, managing low-stake assignments and doing low level assessment and evaluation, teachers will be afforded much needed time to engage with learners in dialogical

communication and intellectual exchange that fosters civil discourse, as well as critical thinking, analytical skills, and other higher order learning outcomes (Edwards et al., 2018). Moreover, if integrated effectively, AI has the potential to transform pedagogical practices in ways that free teachers to employ deep teaching, which could make college classroom experiences more inclusive and equitable for students coming from underrepresented populations, particularly in the STEM fields where exclusionary pedagogy has been linked to attrition (Dewsbury, 2020). To make my case, I begin by tracing the history of several educational technologies that have been introduced, scrutinized, and then adopted in higher education over the years. Then I offer a broad historical account of risk perceptions regarding AI as it has become more sophisticated in recent years. Finally, I propose why and how we as teacher-scholars need to shift our mindsets from fearing the unknown to embracing the ever-changing landscape of higher education regarding AI. In other words, I propose food for thought regarding innovative ways to employ AI to our advantage, not by replacing teachers, but by providing means for improving what teachers do (Sellnow et al., 2022).

Technology adoption in higher education

Prior to the invention of the moveable-type printing press by Johannes Gutenberg in 1440, teachers had relied for centuries on oral communication and lecture methods as the primary mode of instruction (Wakefield, 1998). The teacher was responsible for both disseminating information and explaining material to students. This was due in part to the fact that, until then, books were both costly and time-consuming to produce (Li, 2023). By the end of the 15th century, however, books were being mass produced and made available as supplements to oral lectures.

Throughout the decades that followed, lively debate ensued about the use of textbooks based on issues of ethics, policies, politics, religion, and accessibility (Some poorer countries still do not have access to mass produced textbooks today.) (Altbach, 1983). Although many of these debates about textbooks continue today (including questions about the viability and integrity of open access resources and textbook technology supplements), textbooks have become a prominent educational technology for acquiring information (Sellnow et al., 2005). Arguably, when students prepare for class by reading assigned chapters, instructors may expand on that information to “simulate students’ curiosity and desire to explore knowledge, so that they can actively learn and acquire skills” (Li, 2023, p. 221).

In the 1950s and 1960s, television was introduced as a new technological tool for use in teaching and learning (Buckingham, 1998). Again, academic teacher-scholars debated its utility, fearing it would hinder learning rather than stimulate curiosity (Li, 2023). McLuhan (1975), considered by many to be the “father of media studies,” even coined the phrase “the medium is the message” to account for the pervasive role of television in both reflecting and shaping beliefs and behaviors. Perhaps most critical to acknowledge here is that television can be used effectively when teacher-scholars integrate it mindfully into their pedagogy rather than as a replacement for teaching and learning—also sometimes referred to as surrogate parent or babysitter (Gantz, 1982; Hillard, 1958). Teacher-scholars continue to report that television, when used mindfully, can be an effective technological teaching tool,

particularly as it supports learning among students in low- and middle-income communities and countries (Watson and McIntyre, 2020).

In the 1980s, personal computers and word processors were introduced as new technologies to replace typewriters (Blissmer, 1985; Flores, 1983). At that time, scholars warned of the inherent biases in computer programs that could, if not managed properly, be passed on to learners in the guise of them being neutral tools rather than mediators of culture (Bowers, 1988). Debates also abounded about whether these technologies would hinder analytical and argumentation skills, spelling and grammar capabilities, and the iterative process of writing and revising (e.g., Keefe and Candler, 1989; Owston et al., 1992). Based on a plethora of research examining the relationships between these technologies and learning outcomes, personal computers and word processing software are taken-for-granted as effective tools for use in higher education today. As Reys and Reys (1987) reported, similar arguments were posed when calculators were introduced into classrooms.

A final historical example (among many) I will mention is the internet. Some of the initial concerns focused on (a) the inability of students to evaluate online information and sources (e.g., Wikipedia) (Ayers, 2006), accessing class notes on websites (Sharma and Mayleyeff, 2003), purchasing papers from online paper mills (Phillips and Horton, 2000), internet plagiarism (Howard, 2007), gamification (Caponetto et al., 2014), and internet addiction (Ambad et al., 2017). As online courses became popular, additional concerns were raised about how this internet environment would also reduce student engagement, intellectual curiosity, and learning outcome achievement (Means et al., 2014).

When the COVID-19 lockdown forced colleges and universities around the globe to move to online learning, a plethora of research ensued. Among other things, this body of work revealed that the internet (i.e., technology) is not inherently disruptive to achieving desired learning outcomes (e.g., Kryston et al., 2021). In fact, some positive implications of online learning include its potential to reach non-traditional students, to be accessed anytime and anyplace, and to provide opportunities for guest appearances by notable scholars and industry experts (Sharma and Mayleyeff, 2003). Moreover, studies illustrate how online pedagogical practices can foster a positive classroom climate, student engagement, and learning in myriad ways (e.g., Cole et al., 2021; Kaufmann et al., 2016; Sellnow and Kaufmann, 2017). As Zuin and de Mello (2024) conclude, critical thinking and dialogical communication as proposed by Freire (2018) in *Pedagogy of the Oppressed* and *Pedagogy of Hope* (1992) can be cultivated in online classroom environments in ways that overcome structural barriers of exclusion to promote a “pedagogy of freedom” as long as “they are constituted *with* the students and not for them” (p. 988). Ultimately, as has been the case with other new technologies, the key is to integrate the internet in pedagogically sound ways based on theoretically driven empirical research (Strawser, 2017).

With this foundation in mind, I argue AI can also enhance educational experiences when integrated mindfully. To do so, we must begin by addressing risk perception concerns raised by skeptics through theoretically driven empirical research. Then, as before, we will be equipped to develop a series of adaptive best practices for using AI to improve teaching and learning.

Artificial intelligence (AI) and the future of teaching and assessment

Although the role of artificial intelligence (AI) in higher education is a relatively new phenomenon, the term AI was first proposed in 1956 by John McCarty, a mathematician and computer scientist at Dartmouth College (Schwarz and Faj, 2024). Although no universally agreed-upon definition exists, an expert panel at Stanford University (2016) defined it as a “set of computational technologies that are inspired by—but typically operate quite differently from—the ways people use their nervous systems and bodies to sense, learn, reason, and take action” (p. 4). The European Commission High-Level Expert Group on Artificial Intelligence (2018) extended this definition to claim that “AI systems can also be designed to learn to adapt their behavior by analysing how the environment is affected by their previous actions” (p. 7). Schwarz and Faj (2024) point out that people across the globe “are experiencing high levels of uncertainty, if not fear, regarding the impact of these technologies” and how they are being “embedded and regulated in present and future society” (pp. 504–505). Based on a content analysis of articles published in the *New York Times* and the *Washington Post* from 1985 to 2020, Cools et al. (2022) identified 10 topics of interest/concern regarding AI, education being one of them.

Regarding education, many fears about AI stem from the fact that it can be used for good or evil at the same time, as well as both intentionally and unintentionally (Brundage et al., 2018). Moreover, fears have grown exponentially with the introduction of ChatGPT in November 2022—an AI-based chatbot “capable of generating cohesive and informative human-like responses to user input” (Lo, 2023, p. 410). In their comprehensive content analysis of AI in education from 2010 to 2020, Zhai et al. (2021) discovered three prominent risk perception themes. These include the “inappropriate use of AI techniques, changing roles of teachers and students, as well as social and ethical issues” (p. 1).

One major concern stems from the fact that so much progress is being made in speech and image recognition, speech and language generation, and language comprehension. Consequently, educators worry about the spread of misinformation and disinformation and students’ (in)ability to discern fact from fiction, as well as what makes for quality information and quality sources (Bringula et al., 2021; Ojukwu and Saidu, 2025). They also worry that students will use free generative AI tools like Grammarly or ChatGPT unethically to conduct research and construct essays (Lo, 2023). Other concerns revolve around what Bill Gates proclaimed—that AI and robots will take over the jobs of teachers, rendering the role of the instructor obsolete (Okulich-Kazarin et al., 2023). Similarly, some worry that teaching assistants, who are often employed to fund their graduate education, will no longer be necessary (Kim et al., 2020).

I argue that we should reimagine AI in higher education not as something to be feared but, rather, as something to be embraced as an opportunity to improve what we do and how we do it. We ought to use these concerns as our foundation for conducting future research that will ultimately inform best practices regarding the role of AI in teaching and assessment. In other words, I agree with Alam’s (2021) conclusions based on a comprehensive review of literature that AI can be employed to perform a range of administrative tasks more quickly and efficiently (e.g., assessment, grading, feedback) and that the benefits of using it with integrity clearly outweigh the disadvantages.

I also agree with Louis and ElAzab (2023) that “teachers remain at the helm of major instructional decisions” (p. 9). As we have done with other technologies, we can and should conduct research to determine what methods are best for getting students to achieve the desired learning outcomes using AI. Herein is where teacher-scholars have an opportunity to influence how AI is utilized to enhance teaching and learning experiences. Let us learn from the past to lead us into the future. For example:

- Just as teachers eventually embraced textbooks as a resource to prepare students for class, thereby freeing them up to focus on active experiential learning (Dewey, 1938; Kolb et al., 2014), so too can teacher-scholars conduct research to determine how AI can similarly provide foundational information upon which to build opportunities for deep teaching. For example, teacher and students can engage in dialogical discourse, which has already demonstrated its utility to overcome structural barriers and inequities as long as all students have equal access to the tools (e.g., Dewsbury, 2020; Dewsbury et al., 2022; Freire, 1992; Zuin and de Mello, 2024).
- Just as television has been shown to improve learning, particularly among low and middle-income communities and countries (Watson and McIntyre, 2020), so too can teacher-scholars study ways in which an intelligent adaptive AI gamification environment can be employed to motivate students to engage based on diverse personalities, needs, norms, and values (Bennani et al., 2022).
- Just as research was conducted to inform pedagogical practices for using word processing software tools to enhance learning and the environment for learning (Morphy and Graham, 2012), so too can teacher-scholars guide the use of generative AI robots such as Grammarly and ChatGPT to improve the iterative process of composition and communication, particularly when learners must do so in a second language (Gayed et al., 2022).
- Just as instructors learned to embrace internet searches by teaching students how to locate and evaluate quality information and sources they find online, so too can we use generative AI to help teach students to discern quality information from misinformation and disinformation, as well as determine quality sources from bogus or malicious ones (Reddy et al., 2020).
- Just as teacher-scholars developed methods for teaching students to use Wikipedia as a starting point when brainstorming a topic rather than as a primary reference in their research papers, we can discover through research and assessment, ways to teach students how to use ChatGPT as a tool to synthesize a body of work as a starting point when doing research and to evaluate the research ChatGPT draws from to create the summary (Ciampa et al., 2023).
- Just as teacher-scholars conducted research to determine how to integrate online tools to make our jobs more efficient, so too can we lead the way in how to use robots and other generative AI tools to answer redundant student questions, as well as to create and/or assess and evaluate low-stakes assignments (Kryston et al., 2021). Programming AI to perform these duties will not replace teachers; however, it could feasibly provide them with more time to engage in meaningful dialogue and intellectual exchange with students to address higher-order learning such as critical thinking and civil discourse (Selwyn, 2019).

Discussion

I am convinced that AI should not be feared by teachers or students. As with any new technology, we have an opportunity and obligation to do research to inform how we will employ it effectively and equitably. Teacher-scholars have been doing assessment research on new technologies for decades. I propose we accept the challenge once again to create theoretically driven research-informed best practices for employing AI to augment, enhance, and improve teaching and learning. New technologies will continue to emerge and evolve, but the fundamentals of teaching and learning remain. I argue that our goal as teacher-scholars is to adapt research-informed best practice pedagogies to operate effectively using new technological affordances as they emerge. If we do so mindfully, we may even be able to employ AI in ways that address potential structural constraints rooted in economic disparities, administrative imperatives, and governmental or corporate control (Pedro et al., 2019). Whether or not we achieve these goals, however, is predicated on accepting the challenge to try. As Apostel (2017) suggests, “collaboration between peers, students, and artificial intelligence” creates “the potential for creative problem solving and innovation at a level we are only beginning to imagine” (p. 177). I will add that we have an ethical responsibility to conduct the research required to integrate AI mindfully into higher education by adapting best practice pedagogies rather than replacing them.

Data availability statement

The original contributions presented in the study are included in the article/supplementary material, further inquiries can be directed to the corresponding author.

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Generative AI statement

The author declares that no Gen AI was used in the creation of this manuscript.

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