Exploring the Dynamics of Artificial Intelligence in Higher Education

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Abstract

This position paper explores the current state of artificial intelligence (AI) tools, educator support of and opposition to AI tools in teaching and learning, and the ethical and social implications of AI tools in higher education. As technology continuously develops in the educational community, educators must have a voice in how AI exists in the classroom. This paper addresses support of and opposition to AI implementation and the need for more studies on teacher and student experiences with AI tools, such as personalized learning platforms and intelligent tutoring systems. The practical applications of AI in future studies should explore how to best implement AI tools while advancing knowledge and maintaining academic integrity as students and faculty become more technologically literate citizens. Studies in educational technology have acknowledged that social and ethical implications arise from the advance of AI. Programming diverse practices into AI applications impact the data output when generating new content. Therefore, this position paper acknowledges the need for being inclusive in framing technology and AI tools across less developed countries, emerging economies, and developed countries using varying theories, such as situated learning theory, technology affordances and constraints theory, decolonial theory, and intersectionality.

Keywords: artificial intelligence; artificial intelligence in education; higher education; social implications; teaching and learning

Introduction

As higher education institutions traverse the age of global digital transformation, three concepts need further exploration: the current state of artificial intelligence (AI) tools in higher education, educator support of and opposition to AI tools in teaching and learning in higher education, and the ethical and social implications of AI tools in higher education. During the pandemic caused by SARS-CoV-2 (i.e., COVID-19 virus), there were increased development, marketing, and implementation of pedagogical strategies and technology tools as higher education

institutions swiftly implemented emergency remote teaching protocols (Bartolic et al., 2022; Georgsen, 2021; Holmberg et al., 2021). Then as now, academics and social researchers called for an exploration of the benefits, unintended consequences, and social and ethical ramifications of technology, specifically AI, on higher education teaching and learning (Bearman et al., 2023; Luckin et al., 2016). As a result, researchers, organizations, and legislators have taken the initiative to explore the integration of AI in society.

The term "artificial intelligence" was coined in 1956 at the Dartmouth College Summer Research Project by John McCarthy, Marvin Minsky, Nathaniel Rochester, and Claude Shannon (McCarthy et al., 1955). The research project vision was to "proceed on the basis of the conjecture that every aspect of learning or any other feature of intelligence can in principle be so precisely described that a machine can be made to simulate it" (McCarthy et al., 1955, p. 2). This vision served as the basis for rooting AI as a formal research discipline (Moor, 2006). Since then, AI has acquired varying definitions across disciplines, institutions, and countries of origin. The Joint Research Centre of the European Commission developed a thorough report to establish an operational definition of AI through the basis of policy and institutional reports, research publications, and market reports (Samoili et al., 2020). Samoili et al. (2020) explain the operational definition in this way:

> Artificial intelligence (AI) systems are software (and possibly also hardware) systems designed by humans that, given a complex goal, act in the physical or digital dimension by perceiving their environment through data acquisition, interpreting the collected structured or unstructured data, reasoning on the knowledge, or processing the information, derived from this data and deciding the best action(s) to take to achieve the given goal. AI systems can either use symbolic rules or learn a numeric model, and they can also adapt their behaviour by analysing how the environment is affected by their previous action. (p. 29)

Zawacki-Richter et al. (2019) recognizes that the field of AI is interdisciplinary, including "a range of technologies and methods, such as machine learning, natural language processing, data mining, neural networks or an algorithm" (p. 3). Furthermore, researchers in the Global North, or developed countries, and Global South, or less developed or emerging countries, explore the implications, challenges, and risks associated with AI, but a consensus has not been reached on defining AI. Therefore, this paper defines artificial intelligence as an advanced technology-based resource fueled by diverse and equitable intelligent systems that approach and perform human-

based cognitive tasks with accuracy, robustness, and promptness to streamline functions that promote societal advancement and innovation.

In the classroom, applications of AI exist as generative or integrative. Generative AI is more personalized and is dominating education conversations globally as ChatGPT and similar tools raise the concern of academic dishonesty by students (Darby, 2023; McMurtrie, 2023). In this paper, generative AI refers to the use of machine learning to gather, analyze, and combine patterns within datasets and to generate new content in digital formats including but not limited to images, text, and audio (Gozalo-Brizuela & Garrido-Merchán, 2023). Integrative AI combines generative AI and other technology tools to yield new content that enhances predetermined tasks (Albrecht & Aliaga, 2023). While generative AI has become more immediately controversial, both forms of AI are integral to higher education.

In this paper, higher education refers to institutions granting post–high school certificates, technical degrees, associate degrees, bachelor's degrees, master's degrees, doctoral degrees, and professional degrees. In this paper, educators' teaching and learning practices and students' interactions are discussed through McLellan's (1996) situated learning theory. The situated learning theory has eight essential components that foster authentic learning experiences through real-world applications. These components include exploring concepts through storytelling, reflecting on learning experiences, engaging in a cognitive apprenticeship, emphasizing collaborative learning, coaching and guiding students in the learning process, incorporating repeated practice measures, articulating "knowledge, reasoning, and problem-solving processes," and implementing technology to "[expand] the power and flexibility of the resources that can be deployed to support the various components of situated learning" (McLellan, 1996, p. 12).

Additionally, the situated learning theory has been used in studies exploring impacts of preservice teacher's technology integration skills on their self-efficacy and content knowledge (Bell et al., 2013; Swan et al., 2002; Vannatta et al., 2001) and examining how their improved technology integration skills and strategies affected student experiences with technology (Capobianco, 2007). The theoretical framework of situated learning theory and other relevant theories will therefore be employed to delve into practical applications of AI tools, educator opposition to and support of AI, and ethical and social ramifications of AI implementation in higher education.

AI Tools in Higher Education

In recent years, the presence of innovative instructional practices and technological tools rapidly increased in the classroom, but the pandemic exacerbated implementation of many practices and tools in order to maintain teaching and learning in K-12 and higher education institutions (Bao, 2020; Mahmood, 2020). A few case studies exploring the transition from face-to-face instruction to fully online learning during the SARS-CoV-2 pandemic, while not specifically including AI tools implementation, did focus on the student and teacher relationship during the transition and recognized the need for technology-based teaching materials. At Peking University in Beijing, China, a researcher explored instructional strategies that supported an impactful transition to online learning after the university launched fully online courses for their typical spring semester start date of early to mid-February (Bao, 2020; Lei, 2020). Bao (2020) highlighted six instructional practices to support the transition, such as emphasizing proper preparation for emergencies; scaffolding course content into smaller chunks; using technology to convey human behaviors, such as body language, facial expressions, and vocal expression; coaching teaching assistants to support faculty members in the online course; incorporating active learning activities for students to complete outside of the classroom; and combining different aspects of online learning and independent learning to promote self-learning, which can be perceived as assisting students with a "better understanding of their thinking processes" (McLellan, 1996, p. 12).

Additionally, Mahmood (2020) presented a case study on the state of remote learning in Pakistan during the transition from face-to-face instruction to fully online teaching and learning during the SARS-CoV-2 pandemic. Mahmood (2020) emphasized ten instructional strategies to support this transition in higher education teaching and learning. These instructional strategies mirror those presented by Bao (2020) but add the need to address poverty issues and neglected areas of infrastructure, such as rural areas lacking access to high-speed internet (Mahmood, 2020). Another instructional strategy includes emphasis on critical thinking, real-world applications in the form of case studies, and development of student abilities, a strategy that aligns with the need for knowledge articulation—a component of the situated learning theory. Lastly, Mahmood (2020) discussed flexibility and support for students to timely complete assignments and faculty to

disseminate recorded lectures to students. Ultimately, Bao (2020) and Mahmood (2020) explored impactful instructional strategies without relying heavily on additional AI tools.

Beyond these broader recommendations, which do not specifically rely on AI, researchers have explored AI implementation through augmented and virtual reality (Fitria, 2023), intelligent tutoring systems (Roll & Wylie, 2016), internet of things (Mershad & Wakim, 2018), open educational resources (Downes, 2021; Pawlowski & Bick, 2012), learning analytics (Dawson et al., 2017), and generative AI (Farrokhnia et al., 2023).

Fitria (2023) conducts a review of augmented reality (AR) and virtual reality (VR) technology in education. The author defines AR as "embellish[ing] existing reality with image elements, sound effects, or text" and VR as "creat[ing] a new simulation environment that presents a specific topic to students in an engaging, interactive, and experiential way" (Fitria, 2023, p. 23). Fitria (2023) used Google Scholar to select articles using the search term "micro-learning" in foreign and domestic journals. The search revealed a total of 26 articles consisting of 13 articles on the prior research about AR and 13 articles about VR. The findings highlight the benefits and limitations of AR and VR, applications of AR and VR in the context of teaching and learning, barriers to AR and VR implementation at educational institutions, and other considerations for implementing AR and VR at educational institutions. Fitria (2023) concludes with optimism for future studies assessing AR and VR use with human participants.

Roll and Wylie (2016) analyzed 47 articles discussing the evolution of artificial intelligence in education from 1994 through 2014 in the *International Journal of Artificial Intelligence Education*. A linguistic analysis of the 47 abstracts revealed the appearance of intelligent tutoring systems in the latter year (i.e., 2014). Roll and Wylie (2016) surmised that the rapidly increasing use of the term "tutoring" supports the notion that human one-on-one tutoring will evolve along with technological advances into a different relationship with the student, allowing swifter feedback to users when human contact is not an option.

At an even greater purview from human one-on-one tutoring, the internet of things (IoT) refers to devices connected to the internet with the intention of exchanging information with other connected devices either to collect data or to control data-driven processes wirelessly without human intervention (Igor, 2020; Luckin et al., 2016). General-purpose scenarios of IoT include homeowners using a personal cell phone to access a security system or vehicle dealerships sending automated notifications to consumers when an oil change is due. However, Mershad and Wakim

(2018) discussed how IoT can also be used to completely transform the educational experience by enabling teachers to offer a personalized learning experience for students, which is realized through the adaptive learning modules of some textbook vendors and learning management systems (LMSs). Mershad and Wakim (2018) have outlined the next steps of their study for implementing an IoT project within their institutional LMS (Moodle). Their project will explore eight IoT applications and provide insight to the student, faculty, and administrators' experiences. The proposed study was completed in 2019 and published in 2020 (Mershad et al., 2020).

Mershad et al. (2020) established the LearnSmart System, an acronym for "LEARNing management SysteM enhAnced with inteRnet of Things" (p. 2701). The study was conducted with 29 students in an introductory chemistry lecture and 37 students in an introductory chemistry lab. Students were also surveyed about their experience with LearnSmart and its usefulness. The results attested to the positive implications of implementing IoT activities that provided live data and feedback for students so they could modify their answers as needed. Faculty members immediately measured a student's progress and could judge whether an intervention was necessary. In addition to LearnSmart, personalized learning can be found in adaptive learning modules of traditional textbook vendors and learning management systems (Sun et al., 2017).

While these proprietary technologies entail costs to institutions and students, college affordability requires a collaborative effort from political leaders, educational leaders, and non-governmental organizations to develop sustainable solutions. One strategy to tackle college affordability is implementing open educational resources (OERs), which are free-to-use instructional materials in varying formats implemented in formal and informal educational settings (Pawlowski & Bick, 2012). Using OERs reduces textbook expenses for students and eliminates first-day access issues experienced by many students (Colvard et al., 2018). Additionally, implementation of OERs supports diverse, equitable, and inclusive practices by allowing the content creator to explore varied topics and the inclusion of diverse voices (Petrides et al., 2018). Creative Commons Licensing labels specify the levels of openness in use of textbooks and instructional materials by designating the proper attributions and resource usage restrictions set by the creator. These restrictions range from lax (CC-BY) to restrictive (CC-BY-NC-ND) (Bissell, 2011). As OERs resonate in discussions of educational technology, these resources are not considered AI as such; however, AI is predicted to change the future of OERs in education. Downes (2021) demonstrates the wide applications of AI to OERs by highlighting the example of

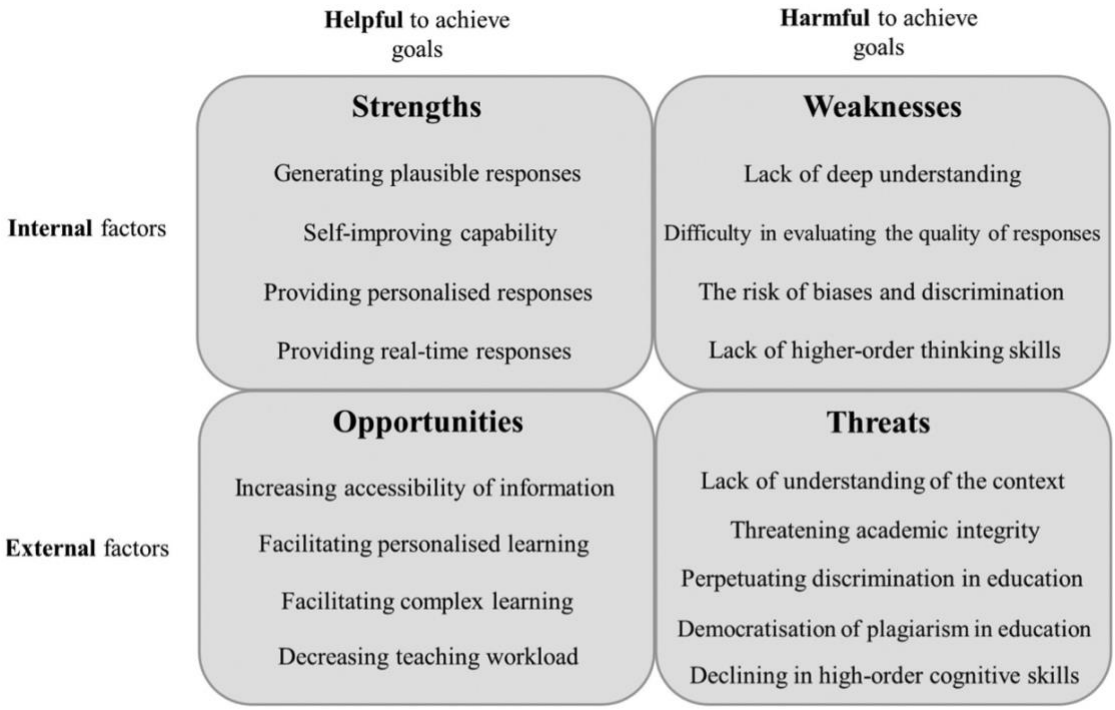
image recognition for metadata processing of images as viewed with Microsoft Azure AI cloud services. Using AI with OER image creation tackles the difficulty that content creators encounter in finding images with open and proper attributions (Downes, 2021).

AI has a more targeted application to education resources through learning analytics, which is a subset of academic analytics that uses student input and activity to create learner profiles in learning management systems (Dunbar et al., 2014). Implementing learning analytics data allows the instructor to explore learner profiles and use predictive analytics to assess student success in the learning management system (Dawson et al., 2017; Frazier, 2022). LMSs, such as Canvas, utilize learning analytics data to enable instructors to predict student progression and, if necessary, plan interventions. Predictive analytics allow for interventions based on the attainment of course metrics set by the instructor. However, studies show the need to position learning analytics as a resource with advanced statistical methods for data analysis (Dawson et al., 2017). Instructors should also tread cautiously in using learning analytics lest they violate the privacy of vulnerable populations in the classroom (Picciano, 2014).

Other concerns arose when the Chat Generative Pre-trained Transformer, also known as ChatGPT, made its public debut in 2022, prompting debate about the effects of AI on academic integrity in higher education (Farrokhnia et al., 2023). The chatbot tool uses an OpenAI model to complete tasks, such as answering questions and writing personalized content based on a previously trained dataset. Farrokhnia et al. (2023) used the SWOT analysis framework to identify foundational strengths, weaknesses, opportunities, and threats to higher education with the onset of ChatGPT. Figure 1 illustrates the internal and external factors driving the strengths, weaknesses, opportunities, and threats in using ChatGPT. The strengths and opportunities lie in providing personalized, real-time responses and in allowing for self-improvement. The weaknesses and threats reside in unintentional harm to student learning or to the educational institution itself (Farrokhnia et al., 2023). These findings align with my concerns about the future of learning assisted by emerging technologies at community college institutions. Future empirical studies are needed to address the effects of implementing ChatGPT and other emerging technologies at these institutions.

Figure 1

SWOT Analysis



Note. A SWOT analysis was conducted on the implementation of ChatGPT at educational institutions. (Source: Farrokhnia et al., 2023)

Educator Support of and Opposition to AI in Higher Education

In the push to integrate technology into higher education due to its presumed benefits, the actual benefits have been found to vary in the learning environment. This section reviews the educational performance of AI in particular, focusing on a quantitative study and a qualitative study, both of which support AI implementation along with a literature review consisting mostly of empirical studies.

As a quantitative study, Nazari et al. (2021) conducted a randomized controlled trial with postgraduates enrolled in an English writing course to test whether using an AI-powered digital writing assistant, such as Grammarly, promoted improvements in engagement, individual self-efficacy scores, and academic emotions scores. An independent t-test revealed no significant differences between demographic features (gender, field of study, age) and other dependent variables (digital readiness, self-efficacy, engagement, positive emotion, and negative emotion). An ANCOVA analysis revealed a statistically significant result ($p < 0.001$) for behavioral

engagement, emotional engagement, cognitive engagement, self-efficacy, and academic emotions as the main effects arising in group and between-group comparisons. These results indicated that the AI intervention improved engagement among users and improved their self-efficacy and academic emotions scores, a finding that coincides with previous research studies revealing that qualitative studies would help us understand valuable insights from teachers and students on AI implementation (Nazari et al., 2021).

Kim and Kim (2022) used a qualitative model to explore teachers' perceptions of AI in science writing lessons—specifically, how teachers perceived the use of AI to scaffold their scientific writing lessons, and what issues they observed arising from using AI in the classroom. The teacher participants were enrolled in a doctoral program and had experience with educational technology, but they had never integrated AI into their classrooms. The teachers used the artificial intelligence-enhanced scaffolding system (AISS) designed for "the academic writing process, focused on argumentation support" using GPT-2 (Kim & Kim, 2022, p. 4). Chat GPT-2 is an OpenAI model designed to generate responses based on a dataset previously coded into the system (Gozalo-Brizuela & Garrido-Merchán, 2023). Teachers used the AISS to generate paragraphs based on their own written work. Data analysis followed a thematic case analysis with two-researcher coding, which resulted in a high inter-rater reliability of $\alpha = 0.93$ (the minimally accepted level for Krippendorff's α is 0.667.) The study revealed that the teachers reported positive feedback about their experience using the AISS. However, teachers expressed concerns about their reduced roles in the classroom and about the AI's response reliability and unpredictability. Despite these concerns, Kim and Kim (2022) recognized the need to alter teachers' perception of AI-based educational tools, especially among the older generation, whereas younger teachers have had prior exposure to and interaction with technology. Kim and Kim (2022) acknowledged the importance of educators understanding how they coexist with AI in the classroom, especially in STEM fields.

Zawacki-Richter et al. (2019) conducted a literature review on research studies involving AI applications in higher education. As their three research questions, the authors investigated characteristics of research articles that met the study's search criteria; assessed the conceptualization, ethical implications, challenges, and risks associated with AI; and enumerated the types of AI applications in higher education. Regarding the first question, the research articles' characteristics, the number of articles per year rose sharply from 6 in 2007 to 14 in 2015 and 23 in 2018. Regarding the second question, Zawacki-Richter (2019) observed a tremendous gap in the

literature on the ethical implications, challenges, and risks associated with AI in education. Of the 146 articles analyzed, only two critically assessed these factors. Lastly, the literature revealed four areas of AI applications in higher education. These four areas include adaptive systems and personalization (5 subcategories), assessment and evaluation (4 subcategories), profiling and prediction (3 subcategories), and intelligent tutoring systems (5 subcategories). These findings point the way to future research regarding the creation, selection, and implementation of AI tools.

Opponents of generative AI have implied that many AI tools do not create new content since generative AI tools scour online sources and compile data into a format for regurgitation by the user, thus violating laws regarding intellectual property (Sakkal, 2023). The system lacks the nuances of human language, as has been observed with institutions using OpenAI to disseminate sensitive information to the public, such as when Vanderbilt University sent an AI-generated email about a Michigan State University mass shooting (Korn, 2023). While these broader controversies are significant, this section is confined to issues with the use of AI in higher education.

VanLehn (2011) proposed that intelligent tutoring systems supplement human tutoring, especially since intelligent tutoring systems have proven to be as effective as one-on-one human tutoring. The study revealed that human tutoring had an effect size of $d = 0.79$, while intelligent tutoring systems had an effect size of $d = 0.76$. Based on this discovery, the recommendation is not to replace but to supplement human tutoring with AI. This discovery also supports du Boulay's (2016) notion that AI can be a classroom assistant to alleviate menial tasks, allowing teachers to focus on blending learning with AI tools. In opposition to this suggestion, concerns arise with automation since it eliminates the repetition of menial tasks, a neglect that could result in an individual becoming deficient in basic skills, such as mathematical operations (i.e., adding, subtracting, and multiplying) and writing conventions (i.e., punctuation and spelling).

Istenic et al. (2021) developed a model focusing on instructional, legal, and social and affective aspects of social robot integration in the classroom. The study revealed pre-service teachers did not prefer social robot integration because of the possible developmental skills students may lose or fail to learn during classroom interactions. The significance of the teachers' preference, Istenic et al. (2021) indicated, lies in the identification of "the underlying reason for the possible non-acceptability of robots [as] stemming from concerns about children's well-being and harmonious development" (p. 80).

Lastly, some AI features capture user data and interactions through data-sharing capabilities, causing concerns for privacy intrusion in higher education. An emerging concern is AI being used to imitate or recreate likenesses. Celebrities have raised concerns about their image and likeness being used long after death (Boyle, 2023; Takahashi, 2023; White, 2023). Therefore, legal protections over digital likeness are an emerging issue needing attention as digital tools proliferate. Another issue of AI is the impact on diversity, equity, and inclusion. The next section will explore evident and marginalized influences AI has on diversity, equity, and inclusivity in learning environments.

Social and Ethical Implications

As AI is reflected in discussions locally and globally, concerns have manifested in the workplace, specifically referencing job security. Mirbabaie et al. (2022) indicated that three factors affect the workplace regarding AI implementation: loss of status position, changes to work responsibilities, and AI identity threat. Loss of status position can refer to a loss of usefulness in the current role, which threatens job security. The authors also acknowledge a potentially beneficial shift in work tasks, allowing the AI to complete lower-cognitive tasks and leave the human open to creative endeavors. Mirbabaie et al. (2022) concluded that resistance to AI stems from factors that must be explored to better understand IT identity threat, or AI identity threat, on individuals in the workplace.

Additionally, this section explores literature reviews of empirical studies addressing the ethical implications of AI and various dynamics of AI implementation, such as inclusion of diverse voices, decentralization of technology, and employing decolonial theories and intersectional evaluation to investigate inequities in AI implementation (Kwet, 2019; Roche et al., 2022). The section begins with discussions of present and unforeseen social and ethical concerns impacting students, faculty, and higher education institutions globally (Bearman et al., 2023; Dietvorst et al., 2014; Hrastinski et al., 2019; Karumbaiah & Brooks, 2021; Lin et al., 2021).

To start with the challenge of AI literacy, one must acknowledge that literacy in the general sense has multiple meanings or exists in multiple forms, but recognition of these differences is contingent on the lens through which the issue is viewed. Harste and Manning (2001) reflected on how literacy in the classroom can differ from how literacy is perceived and taught at home. Similarly, AI literacy may have various definitions just as AI itself exists in a variety of forms. In

this paper, AI literacy is evidenced by comprehension of AI applications through demonstrated satisfactory usage. For instance, Lin et al. (2021) explored whether AI literacy levels impacted "students' awareness of AI ethical issues" (p. 226). The study revealed a correlation between students' AI literacy levels and their perceptions of ethics related to AI. Students with greater AI literacy demonstrated a higher awareness of AI ethics. As a result, these students did not experience growth in the four ethical dimensions on their pre- and post-tests. By comparison, students with low AI literacy levels experienced a significant increase in their AI ethics awareness, supporting the idea that students with higher AI literacy will need additional support to enhance their perceptions of AI ethics, whereas students with low AI literacy can be educated about the ethical implications of their basic usage of AI.

In the same vein, Bearman et al. (2023) conducted a discourse analysis to assess how AI is situated in higher education through terminology and text analysis. The review yielded 29 articles that addressed a gap in the literature on the "ethical, epistemic, and hegemonic impacts of technology" (p. 380). The study revealed two discourses: one addresses the imperative need for changing and adapting to AI (Discourse of Imperative Change) and the other explores the teacher-student dynamic that results from AI decentering the teacher (Discourse of Altering Authority).

Hrastinski et al. (2019) explored the teacher-student dynamic and the relationship between "teachers, researchers, and pedagogical developers" or curriculum designers regarding AI and educational robots (p. 429). The study was conducted as focus group interviews at an international digital education symposium. The researchers worked with 25 K-12 teachers and 40 researchers and pedagogical developers. The analysis revealed thirteen themes with three emerging as central themes regarding AI: teacher knowledge and professional development, individualization of teaching and learning practices in the classroom, and the role of the teacher (Hrastinski et al., 2019). Regarding the role of the teacher, developers posed ethical concerns about accountability for unsuccessful teachers and the failure of the teacher and AI to coexist. Three central themes regarding educational robots were interaction and relationships between educational robots and humans, the teacher's knowledge of technology, and the performance capacities of the educational robot. Lastly, Hrastinski et al. (2019) found ethical concerns as a common emerging theme in teachers' and researchers' reflective writings on AI and educational robots.

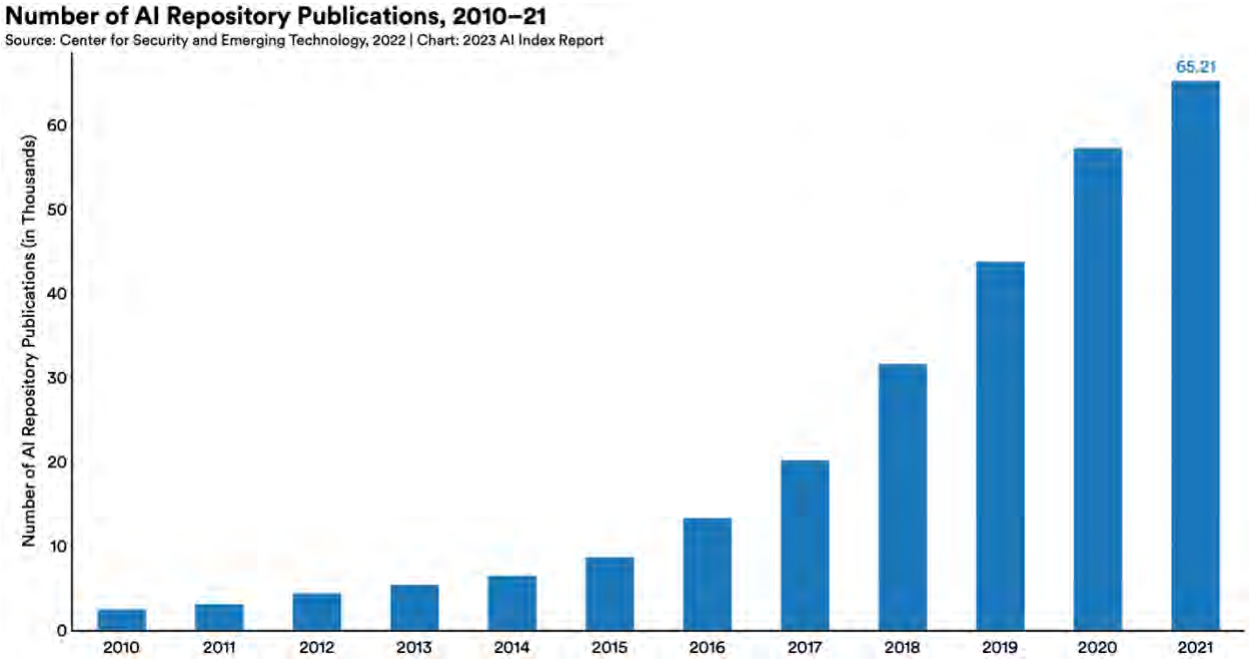
Biases against AI tools in higher education are bolstered by their decision making and forecasting abilities. What happens, for example, when a decision is unreliable in one occurrence

and deemed viable in a separate, but equivalent occurrence? Dietvorst et al. (2014) explored the concept of algorithm aversion, which occurs when humans have a negative experience with a machine (i.e., technology), but then experience the same incident with a human and prefer the human interaction. Dietvorst et al. (2014) posited: "It seems that the errors that we tolerate in humans become less tolerable when machines make them" (p. 2). As a result, recent implementation of AI tools in workplace, public, and education spaces has led to discussions about the biases that machines generate as well as the perceived biases that humans have towards machines (Dietvorst et al., 2014; Mirbabaie et al., 2022).

Consequently, understanding the appropriate technologies to minimize human biases is important in higher education, especially as educators sift through AI tool repositories to research and choose their classroom technologies. Between 2010 and 2021, publishing in AI repositories increased from approximately 3,000 to 65,000 publications (Figure 2). Therefore, it is reasonable for an educator to ponder, "Which tool is most suitable for my students?" This question, while germane to our time, is reminiscent of De Lima's questioning of curriculum in 1942, when he asked, "What must a child know, what knowledge is of most worth?" (p. 17). Educators must take accountability for the resources used in the learning environment, especially when selecting AI tools.

Figure 2

AI Repository Publications



Note. This bibliometric data chart was copied from the 2023 AI Index Report, which was collected from The Center for Security and Emerging Technology (CSET). The CSET is tasked with collecting global data on emerging technologies (Maslej et al., 2023; CC BY-ND).

Moreover, Karumbaiah and Brooks (2021) proposed three vital questions for expanding research in technology and AI design, selection, and implementation: "Whose knowledge is progressing? Whose voices are included in decision making and more importantly, whose voice historically has not been?" (p. 4). These questions should be taken into consideration when selecting tools because, whether deliberately or unintentionally, AI tools are not made apolitical and impartial. In their study, Karumbaiah and Brooks (2021) explored algorithmic injustices in education, which are rooted in coloniality. Coloniality is defined as "seek[ing] to explain the continuation of power dynamics between those advantaged and disadvantaged" (Mohamed et al., 2020, p. 663). These researchers oppose coloniality by operating with decolonial practices that target "dissolution of colonial relations" and "structural decolonization" (Mohamed et al., 2020, p. 664). Decolonial theories have emerged in AI discussions to apply a critical science approach to how technology is situated in society (Mohamed et al., 2020). Power, value, and fairness are dynamic societal factors that need transparent positioning in exploring AI-driven practices.

Ultimately, Karumbaiah and Brooks (2021) emphasized identifying and analyzing practices that are colonial in nature in the field of artificial intelligence in order to apply three tactics for the future of AI design and implementation: "supporting a critical technical practice of AI, establishing reciprocal engagements and reverse pedagogies, and the renewal of affective and political community" (p. 672).

Furthermore, researchers acknowledge the need for the Global South to be included in educational research discussions typically dominated by the Global North (Chaka, 2022; Kwet, 2019; Roche et al., 2022). Chaka (2022) conducted a critical analysis of how big data and datafication in the Global North contribute to digital marginalization, data marginalization, and algorithmic exclusions in the Global South. Chaka (2022) situated the study in identifying how the Global South is defined and how data colonialism exists in the Global South by exploring the importance of digital citizenship since perpetual elimination from big data and datafication denies digital citizenship to individuals. Chaka (2022) highlighted factors that contribute to digital and data marginalization and the intentional and unintentional algorithmic biases resulting in algorithmic exclusions. Chaka (2022) recommended a new approach, critical southern decolonial, to critically challenge big data and datafication, digital citizenship, and algorithmic behaviors for dismantling.

In addition, Kwet (2019) addressed digital colonialism in the Global North from a Global South perspective, using a conceptual framework based on determining where cloud centers are built and identifying AI technologies that "best promote privacy rights, transparency, collaboration, and local development" (p. 5). Kwet (2019) explains how corporate giants, such as GAFAM (Google, Amazon, Facebook, Apple, and Microsoft), can yield economic dominion over South African society through transportation, data information and misinformation, intellectual property rights, intrusions through state and global surveillance, infusion of opposing ideologies, and technology choices in the classroom. To counter these influences, Kwet (2019) argues for support of internet decentralization and the Free Software movement that accentuates the freedom to run, modify, study, and share software. Kwet (2019) argues that integrating technology products from the United States into South African culture would lead to "perpetual resource extraction," making South Africa too reliant on the United States by yielding economic power that could be detrimental in the long run (p. 6).

Roche et al. (2022) conducted a literature review of AI policies based on a collection of articles from 55 countries that included 15 languages. The dataset included documents from international agencies, including the European Union, the United Nations, and the World Economic Forum. The resulting dataset spanned 2010 to May 2021 and yielded 476 documents. Additional screening measures were taken for document collection and analysis before content analysis and coding were iteratively completed. Roche et al. (2022) discovered sparsity of search terms, concentration of documents from the United States, the United Kingdom, and the European Union's European Commission, and documents primarily originating from international organizations. Roche et al. (2022) noted the absence of frequent search terms and codes in publications from the Global South as "non-findings" (p. 1107). Therefore, Roche et al. (2022) proposed future studies will consider the intersectionality of "social, political, cultural, epistemological and ethical contextualization of AI ethics" and colonial theory to address the deficiencies in diversity from the Global South (p. 1110). Ultimately, future studies on ethical and social implications of AI should consider past, present, and emerging frameworks to understand accidental and deliberate underpinnings of AI on society.

Recommendations

The following recommendations are suggested for the future of AI studies.

1. In discussions of AI literacy, consider linguistic literacy, which would require the understanding that linguistic variation exists within and across cultures. An absence of consistent terminology and definitions in the AI field limit the inclusion of documents in literature reviews (Roche et al., 2022). Studies may not be captured because issues with language transferability may have eliminated articles from the dataset.
2. Consider the multifaceted nature of countries in the Global South as they represent various identities, including but not limited to language, cultural symbols, values and beliefs, social norms, economic systems, social association, and religious practices, which are capable of impacting perceptions of external resources, such as AI tools. Assess how these factors afford access to and operation of AI tools for students, educators, and researchers. Future research studies should include collaboration with educational researchers in the Global South to understand how AI functions in their geographic and cultural location.

3. To help improve the impact of AI in higher education, take account of sustainability, which is pivotal to providing the infrastructure needed for digital transformation to occur. "Sustain" is the root word for the environmental science term "sustainability," which refers to meeting the needs of the present generation without negatively impacting future generations' ability to support and meet their own needs (Manoylov et al., 2018). In the IT field, organizations must have the necessary tools to support current institutional strategic initiatives and informational loads and migrate into a space that will sustain the future. Therefore, future studies should include instructional designers, teachers, and researchers contributing perspectives on the nature of technology and AI in student engagement and integrity in the classroom.
4. As AI expands, researchers should employ theories that explore the dynamic between humans and technology, such as the Technology Affordances and Constraint Theory (TACT). This theory addresses the relationship between technological tools and user perceptions of the technology tools in determining their functionality or usefulness (Majchrzak & Markus, 2012). In layman's terms, the user explores what the technology allows the user to accomplish. Chairs afford us to be seated. Doors afford us to enter or exit. Understanding technology affordances in this fourth industrial age of digital transformation is pertinent to becoming a technologically adept society with digitally literate citizens.
5. Address the social and ethical frameworks proposed by researchers from varying academic and economic backgrounds to represent voices of all people impacted by technology tools and policies. The need for inclusion has been validated by established theories in the field of AI studies.

Conclusion

This position paper has presented three foci situating the researcher's perceptions of and relationship to AI: student and faculty perceptions of the current state of AI tools, educators' support of and opposition to AI tools based on their work with implementation, and ethical and social factors related to AI implementation in higher education. This paper has recognized that educational technology has progressed from implementing research databases and datasets to generating information with pre-trained data in generative AI. Instructional practices in the

classroom have gained efficiency through various pedagogical stances, such as active learning strategies. But technology tools add a unique dimension to teaching and learning in the classroom, leading to inquiries about the role of the educator in the digitally transformed era. The educator's role is impacted by their perception of AI and how it alters their position and work responsibilities.

Regarding support of and opposition to AI in the classroom, consideration should be given to understanding the role of AI in facilitating problem-solving, encouraging effective communication between students through strategic use, and allowing for collaboration in the classroom. These considerations represent three of the eight components of the situated learning theory, which advances authentic learning experiences for students.

The fourth industrial revolution is here. Citizens must prepare for a position in the digital world through technology literacy. But digital citizenship must not eliminate groups due to factors beyond their control. Embracing diverse perspectives for AI tool implementation and addressing social and ethical factors require identifying elements with a propensity to oppress and marginalize certain groups, particularly in the Global South.

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