CTRL + ALT + DELETE: Remaking the Teaching Pedagogy for Ethical AI Approaches Across the Educational Landscape

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Abstract

In all levels of education, artificial intelligence (AI) continues to introduce new challenges for all educations. Educators are faced with decisions about the ethical integration of AI into existing pedagogies and whether these integrations are appropriate. In this paper, the author explores the question, "When is it appropriate to introduce students to AI?" and considers whether addressing ethical concerns is equitable for students who are elementary to post-secondary education. The author discusses the digital divide across the educational landscape and examines how AI access can be influenced by the five dimensions of digital inequality. Once the question of when to introduce AI to students is explored, the author presents and discusses suggested pedagogical appropriated for different educational levels. Along with providing suggested incorporations into current practices, suggestions addressing critical elements including how students will practice critical thinking, see AI as a collaborator, and address the understanding of plagiarism concerning utilizing AI for learning.

Keywords: Primary and Second Education, Pedagogy, Equity, Evaluative Judgement, Communications Ethics, Artificial Intelligence, Digital Divide, Digital Inequality.

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Across the Educational Landscape

In recent years, artificial intelligence (AI) has emerged as a disruptive force that has reshaped the educational landscape for students, teachers, and institutions. As AI tools are increasingly integrated into teaching, learning, and assessment, they have exposed unprecedented opportunities for personalized education and significant risks—ranging from reinforcing existing inequities to undermining the roles of educators through opaque, automated systems. By anticipating the social, ethical, and pedagogical implications of AI, educational institutions can better safeguard the values that underpin effective teaching and learning. This paper explores current discourses around AI in education, revealing how ambiguous definitions and shifting power dynamics not only obscure its true impact but also call for a reimagined framework for integrating AI into academia. Ultimately, our goal is to stimulate proactive strategies and robust policy frameworks that address both the promise and the pitfalls of AI, ensuring that its integration contributes positively to the future of education.

Digital Inequality and AI Access in Education

When considering the extent of technology integration within the education system, a recurring theme is the issue of equality. In 2024, the Pew Research Center released data showing that 96% of American adults use the Internet, but still leaves 4% that do not. The disparities in equality cover all levels of education. Using the United States of America as an example, this phenomenon can be observed as early as elementary school, where factors such as state, city, and county funding often significantly influence the resources available to schools. Furthermore, there exists a disparity between public, private, and charter schools, each with its own funding

approach for student education. As digital inequalities emerge in elementary school, these disparities can persist and potentially widen or narrow the digital divide as students progress through their education, depending on their starting point and post-secondary educational attainment.

Considering the disparity surrounding students' education, it is not merely a digital divide, but rather a broader issue that encompasses access to technology and its impact on various aspects of education. As education grapples with the integration of AI into the education system, a comprehensive discussion is necessary that incorporates the lens of digital inequality. Van Dijk (2017) provides a detailed analysis of digital inequality, highlighting that technological access extends beyond the question of internet connectivity and encompasses disparities in skills, usage patterns, and the benefits derived from technology utilization. The concept of digital inequality is particularly relevant within the context of the United States education system, where students' geographical locations, along with the educational funding available, can significantly influence their access to technology.

Although van Dijk's (2017) article presents Digital Inequality as a phenomenon related to technology, DiMaggio and Hargittai (2001) expanded the concept of the Digital Divide beyond the dichotomy of those who have access to technology and those who do not. By moving beyond the binary perspective, the authors propose five primary dimensions that expand the Digital Divide:

- **Technical Apparatus:** The quality of hardware, software, and connection speeds that impact access to the Internet.
- **Autonomy of Use:** The variability in where and how individuals access the Internet.

•**Skill:** Differences in digital literacy and "Internet competence" that affect users' ability to navigate and derive benefits from online resources.

•**Social Support:** The presence or absence of technical and emotional support networks that can enhance digital learning experiences.

•**Purposes of Use:** Variations in the goals and outcomes of Internet use.

When considering the application of AI in education, the influence of institutional factors, corporate strategies, government policies, and technical investments also shapes the aforementioned dimensions, contributing to overall digital inequalities and, in this article, the accessibility of AI tools in educational settings.

Continuing with DiMaggio and Haggittai's (2001) five dimensions of the Digital Divide, these can be further categorized into additional layers, extending the divide areas to individuals who have access to technology but are still disadvantaged due to socioeconomic disparities. Robinson, et al.'s (2015) definition of digital inequality, which encompasses access, usage, skills, self-perceptions, and future research directions (p. 569), provides a comprehensive framework for going further into the additional layers of the Digital Divide. For instance, the authors emphasize the digital divide during the primary school era, which can further exacerbate the disadvantages faced by students who utilize technology. Given the increasing reliance on technology in education, such as web portals for parental communication and learning management systems for coursework, children who lack consistent access to social digital landscapes may fall behind their peers.

As education and the digital realm continue to converge, students with proficiency in technology are able to achieve academic success and gain access to enhanced opportunities

presented in the digital realm, in contrast to their technologically disadvantaged peers.

(Robinson, et al.) Achieving a level playing field across academia presents a significant

challenge, as it is influenced by various external social constructs that impact students, including

socioeconomic status, gender, and race. Focusing on the American education system, it must find

equitable integration of artificial intelligence into the academic ecosystem. Researchers need to

consider the areas of students' lives, family economic standings, and racial and gender

stratifications.

Considering the accessibility to these technologies at home, this digital divide during the

primary school era can further disadvantage students using technology. With the education's

reliance on technology such as web portals for parents and learning management systems for

coursework, children who do not have consistent access to the social digital landscapes begin to

lag behind their counterparts (Robinson, et al.). These gaps can continue into post-secondary

studies. Robinson et al. make a point to the long-term effects this can have on students, noting,

"Thus, a new form of digital inequality comes into being at this stage; individuals who can

master multiple ongoing flows of digital information acquire an advantage over their peers who

struggle to manage these information flows" (p. 572).

Academics primarily focus on the student's academic success within the classroom

setting. However, they also need to consider how students' families interact with the digital

environments. For the entire education system, the disparities students can experience when

utilizing AI for home and scholastic purposes can be significant. Consequently, understanding

the implications of entering information into AI systems leads to a distorted comprehension of

information sharing and access. If students are engaging in information sharing within a digital

landscape through platforms like social media without considering consent for the information provided about themselves or others, this presents an opportunity for all educators to address the introduction of AI and its applications to students. In addition to assessment of learning, academics now have a new responsibility: to instruct and guide students in using AI ethically and effectively.

Digital inequality is not only about whether students have access to technology—it also includes differences in the quality of access, digital skills, social support, and how technology is used. These disparities create varied starting points for students across the educational spectrum, directly impacting the potential success of AI integration. Keeping these considerations in mind, the following sections explore how AI is implemented differently at primary, secondary, and post-secondary levels, and what strategies can help overcome these existing inequalities

AI in Primary, Secondary and Post-Secondary Education: Opportunities and Challenges

AI's malleability based on information provided can be seen as a powerful motivator to integrate early on in primary schools. Teachers being able to review student data and performance in day to day studies is something that can optimize the instruction time through targeted feedback and early detection of student struggles. (Guan, 2023). If teachers are to understand and use AI as part of their pedagogy, this requires training. Mhlanga (2023) suggests targeted training focusing on the use of AI and handling of student data ethically. They also emphasizes training teachers to also understand the importance of data privacy when working with AI in classrooms.

Addressing personalized experiences for students, this is a consideration for the primary level of education. As students are introduced to a pedagogy that relies on analysis of their

performance and then tailored educational content, this educational practice potentially becomes integrated into teaching practices in higher levels. However, caution needs to be utilized when working with student educational information, leading to the education of school faculty and computer administrators about the ethical uses of data in AI systems.

If the current educational system can integrate AI for personalized learning content for students in primary and secondary education, the focus needs to shift to the educator, and their comfort level working with this technology. Considering the data AI can gather and work through to produce an output, there is the question of if the educator is comfortable enough with the technology and also data analysis to understand what the data is telling them about that specific student (Guan, 2023). Although Guan contends that student data is not the only consideration for the educator's feedback, the author adds assessments are still needed to disseminate the information and provide feedback to the students.

While there continues to be buzzwords regarding AI options including OpenAI ChatGPT, Microsoft Copilot and Google Gemini, there are Learning Management Systems (LMS) such as BlackBoard attempting to integrate AI use. However, many LMSs come with a cost which can contribute to how much AI is utilized in these environments. Additionally, Guan (2023) ties cost to these products noting that, "…ongoing training costs for staff and continuous training required for artificial intelligence systems during organizational process changes can be substantial" (p. 379). Potentially expensive, providing training and software to help educators better integrate AI into their pedagogy seems like a positive step forward. Considering location and funding available to the different schools, and educator choice of how they teach, impacts this potential answer to preparing students to work with AI.

Stepping back from the broader education system and focusing specifically on post-secondary education, Guan's (2023) analysis underscores significant disparities in educational scenarios. Within post-secondary institutions, educators often possess considerable creative autonomy in designing and teaching courses. While training can effectively demonstrate the positive impact of AI, the adoption and comfort level of faculty with AI may hinder its integration into course design.

Balancing educator concerns and excitement on seeing how AI fits within the classroom and teaching is difficult. For those in education who see the benefits of AI in current pedagogy, they may be more likely to participate in trainings and experiment with AI in their classroom (Guan, 2023). Consequently, this can lead to a quiet minority of educators with no space to share concerns and be heard. Bearman, Ryan, and Ajjawi (2023) note in their research the Discourse of Altering Authority, which points to the idea that AI could lead to changing both the role of student and teacher, which can help understand the reservations of educators who do not want to have AI integrated into the curriculum. Although in some primary and secondary education systems, there is standardization of content, if students become comfortable working alongside AI, it could prove to be a jarring shift to post-secondary education where faculty could decide to not incorporate AI into their course structure.

Even if educators are open to learning how to integrate AI into their current pedagogical practices, there is still the protection of information that is tracked and used with AI software. This is a concern for all participants and their privacy, but also protecting academic integrity and course content created by instructors (Guan, 2023). While discussions focus on AI integration into learning environments, future discussions must be had regarding how institutional

technology staff collaborates and handles AI. Pham and Sampson (2022) address Artificial Intelligence in Education (AIED) and the lagging of policy makers preparing AI integration into classrooms. Providing teachers with time and training to develop the skills to equitably use AI and be able to overlay assessment practices requires time and practice. With how quickly AI continues to change and evolve, this is significant training for all levels of instructors.

AI in Post-Secondary Education: Pedagogical and Ethical Considerations

As education continues to react to AI's fast paced evolution and integration into the everyday lives of students, it becomes a struggle to determine it's benefits. In a paper by Bates et al. written in 2020, the authors emphasized how limited evidence of AI improving academic achievements is. Although the authors note that there predictive analytics were starting to emerge, there were no solid suggestions to results of AI implementation at that time. Since Bates et al.'s article, there has been tremendous evolutions with AI including newer and more powerful AI systems, paid levels of access, and further integration into Learning Management Systems.

Halaweh (2023) presents another pedagogical struggle that uses ChatGPT as an example of the accessibility of AI and notes that this leads to easier accessibility for both educators and students. Focusing on post-secondary education, Halaweh (2023) discusses universities needing to be proactive in the integration of AI technologies into their ecosystems. Using the example of 'reverse searching', which encourages students to utilize writing skills to create prompts, questions and keywords to be able to gather information from ChatGPT and then evaluate the information provided to determine if it is a trustworthy source. The author notes that plagiarism can still occur, but that with reverse searching and proper citations, it is not considered plagiarism (pg. 4). Halaweh adds that with this method, "…human-AI collaboration is achieved

at two levels: idea generation and development, texts editing and paraphrasing" (p. 4). However, this brings into question Robinson, et. al. (2015)'s point to children and the digital inequalities faced as they are raised. Considering the different backgrounds that students bring into the classroom that create a digital divide, the growth to achieve human-AI collaboration could continue the struggle of students being on equal-footing.

In Eaton's 2024 article, the author further elaborates on contemporary ethical concerns pertaining to AI assessment tools. These concerns encompass the potential development of biases within these tools, raising questions about the evaluation of diverse student groups and undermining the credibility of the evaluation process. The author draws a connection between these concerns and the training of educators, noting that educators are not adequately equipped to comprehend the algorithms employed by AI assessment tools but are solely trained to utilize them. Consequently, the lack of control over the implementation of AI assessment tools can exacerbate the digital divide, leading to the development of digital distrust. This distrust can manifest in both students and educators. Transparency regarding the AI assessment process is crucial to prevent student frustration and maintain their motivation to learn. Conversely, educators may lose trust in AI assessment tools if students are incorrectly assessed, leading to a decline in their reliance on these tools.

Conclusion

In this paper, the author presents an overview of considerations for resetting academia's approach to AI. Given the rapidly evolving landscape surrounding AI, both students and teachers face addressing ethical concerns, general education goals, and its implementation in the classroom. Considering educators, new pedagogical approaches need to be developed. Training

for current teachers serves as a suitable initial step to address these changes as they unfold. Feedback from current educators, either on the success of training or personal observations, should also be considered when moving forward with addressing AI. For future educators, incorporating AI pedagogical and ethical training into degree programs is an approach to prepare the next generation of educators.

For students, trust in the process needs to be developed early in their academic careers. If this is achieved, utilizing AI as a tool can begin to enhance the student's educational experience. The author also suggests students need to develop ownership of their educational experience. If AI is to be a tool for students, they cannot be passive about their education. Students must be engaged, critically think and communicate with their teachers about assessment feedback.

Overall, through researching when to introduce AI to students, it became clear there is a lack of research that provides how AI effects the educational process and system. Longitudinal studies are needed now. This is especially true to help the educational system be a proactive participant addressing AI in today's society while also developing the body of knowledge to further understand if the digital divide is expanding or shrinking, if AI is creating an equitable learning environment, and how to continue to ethically approach student information and educator developed curriculum.

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