Toward More Just Technological Futures: Empowering Educators to Critically Approach Educational Technologies

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Abstract

In schools and society, technologies are often viewed as central to productivity and progress. However, technologies always include trade-offs with downsides that cause disproportionate harm to often already marginalized groups. Recent enthusiasm for how to use large language models (LLMs) to support student learning has tended to sidestep concerns that LLMs could reproduce inequality through centering majoritarian perspectives and accelerating learning for those traditionally advantaged in the K-12 education system. This leads to an urgent need to build an understanding. My larger research aims to prepare educators to consider not just the benefits of technology and LLMs specifically, but also harms and injustices caused by LLMs. In the long term, the proposed work has the potential to empower citizens to interrogate the effects of technologies on our individual and collective lives in order to work toward a more democratic and just intersection of technologies and society. In the near term, this work will prepare teachers to consider the challenges and benefits of using generative AI in their lives and classrooms. Because of the CELSJE Summer Research Grant, I was able to:

- Apply for a $316,000 RAPID NSF grant on AI in Education;
- Host an online conference engaging over 300 practitioners in technoskeptical and data justice actions;
- Develop and disseminate a research agenda to guide the field of educational technology and teacher education in using and investigating LLMs (invited to be published in ETRD, a top-tier journal in education technology research)

Toward More Just Technological Futures: Empowering Educators to Critically Approach Large Language Models in Education

In November of 2022, Open AI introduced ChatGPT to the world, prompting hundreds of articles, think pieces, and emerging research (e.g. Chiang, 2023; Harwell & Tiku, 2023; Roose, 2023) on the effects of large language models (LLMs) on society, education, and our individual lives. During this time, educational organizations and individual practitioners have begun to implement LLMs into their K-12 instruction (ASCD, n.d.). While LLMs in society and education may be relatively new, algorithms, artificial intelligence (AI), and natural language processing (NLP) models have existed for decades. Recently, a growing body of researchers have called attention to the algorithmic injustice embedded within the AI models and their damaging impact on marginalized people (Benjamin, 2020; Costanza-Chock, 2020; Noble, 2018; O'Neil, 2017).

The rapid technological changes of LLMs coupled with a hasty implementation in education may result in direct harms to already marginalized and minoritized students. My summer research funded by CELSJE aimed to investigate more equitable practices of LLMs through the lens of technoskepticism (Krutka et al., 2019).

Research Project

My larger research aims to prepare educators to consider not just the benefits of technology and LLMs, but also harms and injustices caused by LLMs. In the long term, the work has the potential to empower citizens to interrogate the effects of technologies on our individual and collective lives in order to work toward a more democratic and just intersection of technologies and society. In the near term, this work will prepare teachers to consider the challenges and benefits of using generative AI in classrooms and with children.

Summer Research Outcomes

I utilized the funds from the CELSJE to help meet my goals for the first year of a larger project, developing technoskeptical curriculum and research agendas around LLMs in education. Specifically, the funds allowed me to:

- Apply for a $316,000 RAPID NSF grant;
- Host an online conference engaging over 300 practitioners in technoskeptical and data justice actions;
- Develop and disseminate a research agenda to guide the field of educational technology and teacher education in using and investigating LLMs (invited to be published in ETRD, a top-tier journal in education technology research)

Below, I further explicate these outcomes.

RAPID NSF Grant

With colleagues at George Mason and Georgia State, I applied for funding to research how AI may promote and impact equitable education and inclusive learning by identifying prompts and possible AI training practices that support culturally relevant pedagogies. The potential for ChatGPT4 as an effective teaching tool for diverse students makes understanding its cultural relevancy and capacity for critical engagement with curricula a necessity. Conversely, given the historical tendency of emerging technologies to reproduce bias and harm for communities of color, there is an urgent need to identify to what degree ChatGPT can help improve access and learning outcomes for minoritized students and /or to what degree it reinforces biases in its responses. Thus, the proposed study aims to address this need through a critical analysis and evaluation of ChatGPT's ability to answer prompts from culturally relevant curricula.

In this RAPID project, we proposed simulating the use of AI in a K-12 setting to assess the suitability of this technology as a liberatory tool for minoritized youth. We argue this is a necessary precursor to fielding AI directly to youth before we have developed an understanding of AI's capabilities because of the potential for AI to demoralize minoritized youth due to encoded bias in large language models (Bender et al., 2021; Barocas & Selbst, 2016).

Civics of Technology Conference

This year's conference theme of *Liberatory Tech Action* builds on the Civics of Technology project motto, "Technologies are not neutral and neither are the societies into which they are introduced." One of the conference aims is to help participants answer the question, *how can we advance technology education for just futures*?

The conference opened with a keynote from Dr. Luci Pangrazio titled, "The importance of critical digital literacies: A manifesto for action." The conference closed with a keynote from Dr. Roxana Marachi titled, "Breaking Free from Blockchaining Babies and "Cradle-to-Career" Data Traps." In between, the conference hosted 18 sessions, including from students in the Ida B. Wells Just Data Lab and an opening plenary panel titled "Practicing Everyday Resistance and Refusal of Ed-Tech." Sessions of particular note and relation to the CELSJE funding I received are:

- Ethical AI and the Construction of Dis/Ability
- Resisting Algorithmic Harm: Community Mobilization in Labor, Criminal Justice & Education
- The Drowning of Teacher Voices by means of Techno-solutionism and Neoliberal Interference
- Black Life in the Age of AI

Proposing a GenerativeAI Research Agenda for the Field of Ed Tech

Because of my research in the area of technoskepticsm and my public facing scholarship through the Civics of Technology project, I have been invited to serve as an expert on panels and keynotes for several national organizations including the American Association for Colleges of Teacher Education (AACTE) and the American Education Research Association (AERA). Most recently, I was approached by the National Technology Leadership Summit (NTLS) to lead a two day workshop in order to develop an agenda to drive research, policy, and practice around generative AI in teacher preparation programs.

After the completion of the workshop, the editor of the *Education, Technology, Research, & Development* (ETRD) journal invited me to submit the research agenda to the journal for immediate publication in their Perspectives section. The funds from CELSJE allowed me time to read, write, and develop my expertise in this area, helping position me as a thought-leader in the field of educational technology around LLMs, justice, and technoskepticism.

Conclusion

My research agenda interrogates the effects of technologies on our individual and collective lives, considering whether technologies support democratic, ethical, and just schools and societies. We cannot wait until technologies like facial recognition are deployed in unjust ways before we act; we must implement curricula that can help teachers prepare students to critically inquire into technologies from the outset. Thank you to CELSJE and the summer research grant for helping me apply for NSF funding, engage with public scholarship, and promote a field-wide research agenda on LLMs and teacher education.

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