Speculative Role of AI in Addressing Inequity

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Abstract: The present study examined teachers' conceptualization of the role of AI in addressing inequity. Grounded in speculative design and education, we examined eight secondary public teachers' thinking about AI in teaching and learning that may go beyond present horizons. Data were collected from individual interviews. Findings suggest that not only equity consciousness but also present engagement in a context of inequities were crucial to future dreaming of AI that does not harm but improve equity.

Introduction

Recent studies report teachers' important views of AI in education such as concerns about AI bias (e.g., Kim & Kim, 2022). However, these studies do not share insights into what/how teacher learning of AI should/can be used to improve equity. There is little knowledge of the role of AI in education for equity. An implicit role of AI for equity is often assumed, as Holstein and Doroudi (2022) noted, "algorithms are often implicitly designed to reduce equity gaps, for example, by attempting to personalize instruction for each learner" (p. 159). Explicit roles of AI in education for equity could include assisting teachers with culturally congruent scaffolding without linguistic discriminations (Finkelstein et al., 2013). In this study, we examined the explicit purpose for equity that teachers conceptualize in using AI. We applied a paradigm of speculative design and education (Arada et al., 2023; Garcia & Mirra, 2023) considering that our teachers would need to imagine new possibilities without firm evidence of how AI should/can be used in education for improving equity. Speculative education refers to "an expansive set of ideas related to visionary and future-oriented approaches to teaching and learning that operate beyond the bounds of current social, economic, and cultural arrangements that perpetuate … forms of oppression" (Garcia & Mirra, 2023, p. 4). We examined our participating teachers' thinking about AI in teaching and learning that may go beyond present horizons. Our research question was: How do teachers conceptualize AI as a tool of equity?

Method

Eight US secondary teachers participated in the study. All but one STEM teacher were science teachers. We analyzed interview data using a coding scheme developed based on literature on speculative design and education (e.g., Arada et al., 2023; Garcia & Mirra, 2023), teacher equity consciousness (e.g., Bukko & Liu, 2021), culturally and linguistically congruent approaches (e.g., Finkelstein et al., 2013), and AI as equitech (e.g., Holstein & Doroudi, 2022; Lin et al., 2021). Example coding nodes are: equity consciousness continuum, equality (not equity) to remove physical disparity to access, sociocritical view of equity beyond physical disparities to access, and imaginaries for *other* ways in the classroom of inequities.

Findings and Discussion

Theme 1. Currently being in a context of inequities was a ground for imagining AI that goes beyond present horizons for equitable education

Speculative education is "for future-facing approaches to learning and design and addressing inequities of the past that continually haunt this present moment" (Garcia & Mirra, 2023, p. 8). Our teachers who did not report lived experience in a classroom of inequities shared no imaginary AI that would do something in classrooms to counteract particular inequity issues. One teacher, Allison, who shared her speculative design for AI that would do things for her minorized students did so as imaginative solutions for tensions and disrespect in her classrooms due to racial and economic inequities, as described below:

> We have various races: Black, White and a few other races as well. But the economic diversity, I think, is what's the most drastic. I have kids that come in with their Patagonia jackets and they're clearly more of an upper class. And then I also have kids that are free and reduced lunch and are in very, very different economic situations… We have a lot of racial tension at the school. That does kind of bleed into the classroom, honestly. There's a lot of underlying issues that kind of skirt around sometimes... It's tough because you're also teaching kids science, but then you're teaching them how to be respectful towards others and learn about different cultures.

Allison later referred to these inequities and their impact on her students' science learning. She then shared her imaginaries for a personified AI with informality that communicates with minoritized students about their science writing. She also shared her imagined AI that ensures cultural sensitivity in assessment items for students from minoritized cultural backgrounds. Allison's school is by far the most diverse among all teacher participants' schools in terms of race, ethnicity, and SES. Speculative imaginaries are to inspire people to view other possible worlds, just as imaginative fiction does. Unless one wishes to do things that cannot be done currently but are needed to address specific inequities, one does not want/need to dream about other ways. Allison did dream about other ways with AI, but not other teachers. For example, Evelyn stated the function of AI as a translator.

Theme 2. Seeing equity issues as deficits to fix, different cultures to understand, or oppression to break off mattered in conceptualizing the role of AI

Different teachers viewed different equity issues as critical. Some teachers focused on efforts to engage with (a) a wide spectrum of student abilities (Lisa), (b) varying cultural backgrounds (Chloe), (c) variations in student progress within a curriculum (Evelyn). Allison focused on tension and oppression from racial and economic inequities. When prompted to imagine AI to address equity issues, their answers were aligned with their focused views. That is, for Lisa, AI should be designed to fix deficits in lower ability students through feedback. Chloe said that AI should provide information about different cultures to relate to students from different backgrounds. For Evelyn, AI should translate languages so she can communicate with immigrant students to fix their incorrect perceptions. In contrast, Allison thought that AI should assist with fair assessment responsive to background knowledge, assumptions, and linguistic forms of/used by minoritized students. Equity consciousness was on a spectrum varying from deficit views, to some understanding of subgroups, to understanding of oppression and privilege that need equity enactment (Bukko & Liu, 2021). Findings suggest that how equity is conceptualized guides how the role of AI in promoting equity is conceptualized. These findings also reinforce calls for actions to enhance understanding of racial inequity and other inequities (Garcia & Mirra, 2023).

Theme 3. Credibility was fantasized in imaginary AI that deconstructs equity issues

All teachers had various concerns about AI. For example, Lisa noted, "AI can be dangerous for plagiarism, impersonation and used with malicious intent." Allison noted, "The dangers are that the AI can be biased in some way. The other danger is that people might think that the purpose of AI is to replace the person/teacher." And yet, to deconstruct inequity issues, it seems that Allison prescribed credibility to AI, imaginatively. This explains that she engaged with "future dreaming" for her speculative design for AI that improves inequities in her classroom (Arada et al., 2023, p. 86).

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