

Youth perspectives on the roles and risks of AI in their classrooms

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Abstract: This study uses thematic analysis of focus groups to highlight how middle schoolers discuss the benefits and drawbacks of educational AI. Students reflected on AI's benefits for learning, while also addressing the unsettling risks of being surveilled. Students also noted how AI falls short compared to human counterparts. Overall, we argue that middle schoolers can articulate complex understandings of AI, and their voices should be central in AIED design.

Introduction & Literature Review

As the development of AI technologies for education continues at a rapid pace (Prahani et al., 2022), it is vital for researchers, educators, and students to be aware of the varied benefits and risks of AI tools and the forms of learning that these innovations seek to promote in classrooms. Previous studies of youth perspectives on AI highlight that while students notice the presence of AI in different aspects of their lives, they do not always understand how these technologies function (Greenwald et al., 2021). Researchers have documented how commercial AI software is plagued by issues of algorithmic bias and discrimination along gendered and racialized lines (e.g., Buolamwini & Gebru, 2018), and youth are increasingly aware of the negative impacts that biased technologies can have on their lives, even when they lack the formal vocabulary to describe it (Coenraad, 2022). If we want to ensure more just and ethical AI-driven educational technologies, students' voices must be centered in the design process to help shape AI technologies that impact their classrooms and lives (Hasse et al., 2019). Towards this end, we conducted focus groups with youth interested in AI technologies to explore the question: How do middle school students discuss the roles, risks, and benefits of AI technologies for their classrooms?

Methods

Data were drawn from two different focus groups conducted with middle school aged students (n=15 students, ages 11-14) in the United States. The focus group structure involved students playing an educational game demo that uses AI-driven embodied conversational agents to give students tailored feedback. Afterwards, students participated in researcher-facilitated, semi-structured discussions. Researchers asked questions to jumpstart discussion (e.g., "If you could design an AI helper for your classroom, what would you want it to do?"), but conversations were ultimately student-led. Three hours of audio data were transcribed, and thematic analysis (Braun & Clarke, 2012) was used to draw together ideas from both focus groups into categories of meaning that reflected the various student-articulated benefits, risks, and roles related to AI classroom integration.

Results

Overall, four key themes characterized students' conversations: 1) AI as a provider of engaging learning activities, 2) AI as a tool for surveillance and control, 3) AI as an ineffective replacement for human interaction, and 4) AI as a tool for adaptation and support. When asked how they would design AI for learning, students in both focus groups returned repeatedly to the idea that a well-designed AI agent would encourage their emotional engagement. Multiple students mentioned wanting AI to make learning "more fun" and encourage active participation. This interest in engaging activities led Caleb to propose "make all teachers robots [...] but they have a terrible code that you can hack." This proposal was met with mixed responses from peers; Arun, agreed that a hackable robot teacher "would make the kids learn and would make it more fun" because the activity could be "like an escape room" where students could practice their coding skills. The thought experiment around "should we make all teachers robots?" led students to return repeatedly to the core goal of their robot teacher design – a desire for agency over their learning experiences. Whether or not an AI educator could fulfill the goal of making learning more active, fun, and engaging, students clearly felt that advances in AI technology offered them possibilities to redesign their school experiences to better reflect their own ideals for learning activities.

A central concern students raised was that AI tools cannot always be trusted to keep the information they process private. Students noted that the power of AI could be "kind of terrifying" and that it was important to obtain permission to use people's art, voice recordings, and other data. Sara summarized the group's privacy concerns by saying, "If [a student is] talking to the robot teacher, the robot teacher might as well just be listening

or report to the government on what's happening. And that might be like the person's personal information. So then I think that would lead to the kids feeling like they can't really talk to very many people about what's going on.” In this way, students’ discussions mirrored the broader conversations currently taking place in the public sphere about data security, data ownership, privacy, and trust in the design of AI tools. While students saw power and potential in the ability to design AI tools for learning, they also saw risks in allowing AI-driven agents to have access to their data, especially when they were unsure how their information would be used. Another layer of students’ concerns centered on the inability of AI technologies to adequately mimic human qualities such as emotionality, social support, and intelligence. David argued that the AI chatbot in the demo game, which was designed to answer students’ science questions, was not actually intelligent because the AI tool did not offer more information than a human with a search engine. Ryan noted that “humans are more comfortable with humans”, so AI agents might not be as effective for supporting learning without that sense of social and emotional support. All of these comments suggest that students see clear distinctions between the tasks that AI tools can effectively support, and the more complex parts of teaching that require intellectual and socioemotional skills.

Finally, despite their reservations in terms of how AI can be misused or overused in the classroom, students in both groups noted that AI technologies have the potential to offer useful differentiation for a variety of learners based on their particular interests, skills, and prior knowledge. For example, Mara explained that when playing the game, “if you’re really really knowledgeable in those topics, you would want something more advanced to challenge you.” This focus on tailoring students’ learning experiences ties back to the overarching design goal that students articulated throughout their discussions, which was to generate learning experiences that were active, agentic, enjoyable, and engaging for each individual student.

Discussion

While students’ designs pushed ethical and technological boundaries, at the core of these conversations was a desire for control over their learning experiences. These results suggest that we should not underestimate the complexity of students’ emerging understandings of AI technologies, even when they are still coming to understand how AI functions. Students were able to hold ethical, economic, socioemotional, and educational concerns in tension with one another as they workshoped design ideas together and navigated what the role of AI should be in their classrooms. Centering complex ethical dilemmas in discussions can help youth develop deeper understandings of AI as they express their concerns and their hopes for how these technologies will impact their lives (Lee et al., 2022). Working with students to articulate together what values and risks AI brings to their classrooms can help them to envision new possible futures and the technologies that these futures require (Rasa & Laherto, 2022). Centering students’ voices in the design of AIED technologies offers them agency to imagine and design towards alternative futures where all learning is active and meaningful for their lives.

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