



Augmenting Youths' Critical Consciousness Through Redesign of Algorithmic Systems

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CCS CONCEPTS

• **Human-centered computing** → **Human computer interaction (HCI)**; • **Social and professional topics** → **K-12 education**; **Computing education**.

KEYWORDS

youth, critical consciousness, AI literacy, responsible AI, fair AI, redesign, workshop, computing education

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Background and Methods

Youth are key stakeholders in AI systems, as they interact with algorithms like autocorrect and social media recommendation systems throughout their daily lives [3]. Youth (especially those from underrepresented backgrounds) can be harmed by these systems (e.g., exposure to racial biases reproduced by AI can reinforce marginalization of certain communities) [2]. One way to support youth in having agency with their interactions with AI is through developing critical consciousness, such that they can recognize and deconstruct systemic inequities in technologies. Additionally, prior work has suggested that designing AI can support marginalized youths' empowerment [1, 3]. Therefore, we asked:

How can redesigning a system aid youth in developing their critical consciousness in AI literacy?

To explore this, we ran 4 workshops with youth from marginalized backgrounds (Black youth, girls) of middle and high school age (N = 29) where they augmented a printout of AI-driven technologies that produced biased outputs and ideate how it could be more equitable in their re-design. Learners situated AI bias within

real-world structures of power and were inspired to take action against biased systems, demonstrating two key features of critical consciousness: critical reflection and critical action [4]. We used qualitative thematic analysis on design artifacts and conversations with the youth about their design ideas.

Findings

Situating inequity. Youth found multiple methods to increase equity in AI-driven systems, such as increasing personalization or creating avenues for advocacy. Beyond noticing opportunities for increased fairness in these systems, youth also connected the inequity perpetuated by these systems to their own lives. For example, a learner noted that “I’m a part of Black people and it makes me feel like I’m left out” after looking at images that Google returned for “secretary.” Learners articulated why AI bias creates harm, as one learner designed a screen for the search results page that warned “many AI systems display bias towards groups. This does not represent the changing future of equality.” Learners showed critical reflection through understanding that AI bias reinforces inequitable power structures.

Acting against oppressive systems. Another aspect of critical consciousness is the ability to act against oppressive structures of power [4]. Throughout the redesign activity, youth created compelling calls to action. One learner decorated their search page with megaphones that they labeled as “speak out!” buttons, encouraging users to advocate against bias. Another learner explained their motivation for the designs by stating that “we need to be able to stop the gender, race, and age discrimination with those algorithms so that it’s a better and more accurate presentation.”

Conclusion

We saw that through this lo-fi redesign of algorithmic systems, learners exercised critical consciousness with AI through critical reflection and critical action. Specifically, they could situate inequity they saw in systems with their lived experiences and design ways to act against oppression. This activity could be accessible for teachers to leverage in the classroom when supporting socio-technical AI literacy.

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