Scaffolding Critical Thinking about Stakeholders' Power in Socio-Technical AI Literacy

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CCS CONCEPTS

• **Social and professional topics → K-12 education**; **Computer science education**; **Socio-technical systems**.

KEYWORDS

AI literacy, computer science education, responsible AI, middle school, youth, learning activity

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Introduction and Learning Activity

Socio-technical AI literacy requires knowledge of stakeholders' *power* [2–4] — e.g., the ability to understand and analyze who has power (or a lack thereof) in the design, development, and deployment of AI. However, to our knowledge, this has yet to be more deeply explored in AI curricula for youth. In this study, we asked:

- **RQ:** How can underrepresented youth be scaffolded in thinking about stakeholders' power in creating AI?

To address this, we ran two educational workshops with racially diverse middle school girls (N = 19). We worked with girls, since women are underrepresented as AI creators and thus may have less power as AI stakeholders [5]. We gave the girls two example scenarios, where AI had harmful impacts (Figure 1). After reflection in small groups about the scenarios, we talked about the definition of a *Stakeholder* (a person or group that have interest in, created, or are impacted by the technology) and *Power* (the ability to do, control, or change something). We had learners consider which stakeholders had more or less power in creating the AI scenarios (Figure 2) and then identify and discuss how negatively impacted stakeholders with less power could be more empowered. Specifically, we prompted learners to consider if stakeholders with more power could share their power with others, if disempowered stakeholders could gain more power on their own, and if policy could play a role. We next cover the following preliminary findings from qualitative thematic analysis [1] on workshop artifacts and observations.

Findings and Future Opportunities

Stakeholder Empowerment Ideation. Unlike in Scenario 1, we did not provide the girls with examples of stakeholders in Scenario 2 and saw that they could sufficiently come up with their own stakeholders. From the scaffolding prompts, the girls also ideated different participatory design approaches where stakeholders seen as more powerful could share power with disempowered stakeholders (e.g., *"developers meet with students"*). They also thought that harmed stakeholders had their own power and could have agency by rejecting the AI and *"stop using it,"* or even take a collective advocacy approach to e.g.,*"start a petition or form a strike"* against AI systems. Government policies were also ideated to support harmed stakeholders' empowerment by holding companies accountable, such as requiring that companies know the *"impacts that their invention could have on citizens"* and *"pay fees"* for harms.

Scaffolding Power. We saw that many girls suggested that harmed end-users (e.g., students in Scenario 1) were the least powerful. There is opportunity to further explore if this thought may be unintentionally discouraging (since the youth in this study were students) and how this activity can inspire youths' agency with AI. Although we found that a linear power mapping worksheet (Figure 2) supported critical thinking about stakeholders' power, future iterations may allow for more complex exploration of how power manifests and flows across stakeholders.

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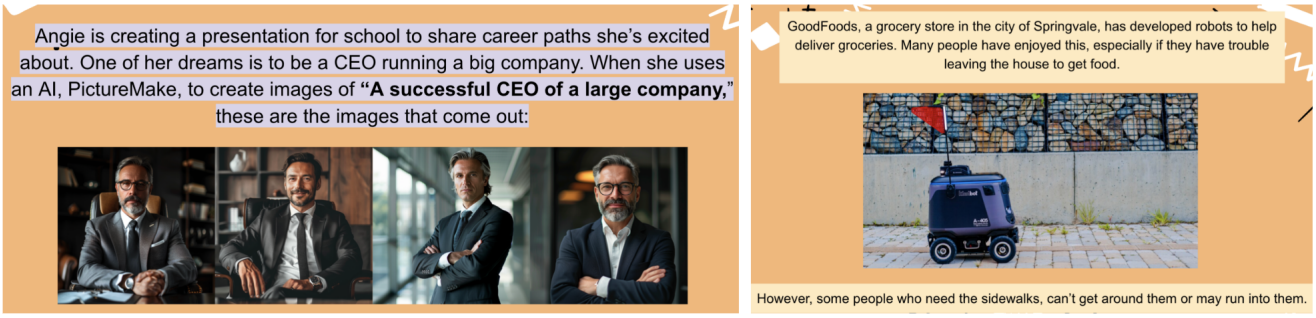

Figure 1: Scenario 1 (left): generative AI with gender-biased outputs. Scenario 2 (right): delivery robot that blocks sidewalks.

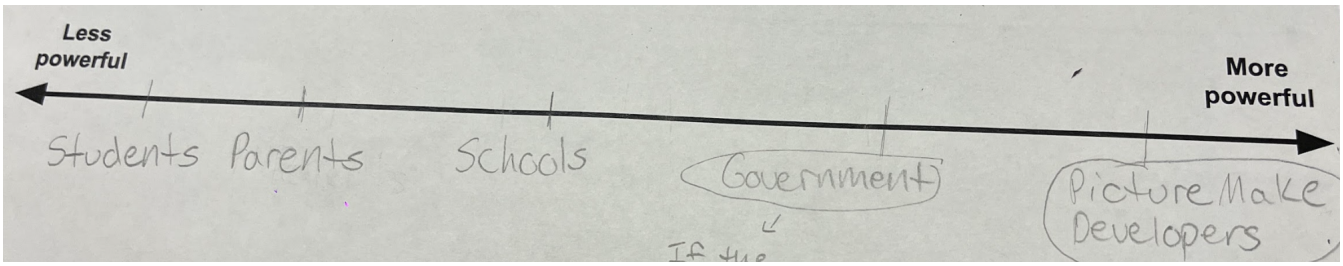

Figure 2: A participant's linear mapping activity to explore how some stakeholders may have less or more power in Scenario 1.

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