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"There Will Always be a Yes and No Side": Facilitating Ethical Sensemaking Around Technology with Teens

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Abstract: As awareness of computing's impact on teens' lives grows, efforts to educate about the ethical complexities of technology are increasing. We present a pedagogical intervention that blends techniques from *Philosophy for Children*, which teaches reasoning and argumentative skills, with *Youth as Philosophers of Technology*, which foregrounds decoding technology's relationship with power through moral, and humanistic inquiry. We evaluated this intervention in a summer elective class with 12 students aged 14-18 in the US. Our preliminary analyses identified: (1) *launchpads* for ethical sensemaking, instances where students leveraged their lived experiences, community discussion, and ethical scaffolding to begin reasoning about moral dilemmas, and (2) *expressions* of ethical sensemaking, signals within students' reasoning processes that indicated critical sensemaking was taking place. We hope to catalyze discussions for researchers on characterizations and trajectories of ethical sensemaking around technology, as well as practitioners on implementations of these concepts in their classrooms.

Motivation and prior work

The rethinking of youths' relationship with computing has been an ongoing topic of discussion in various academic fields. Scholars (Morales-Navarro & Kafai, 2023; Ko et al., 2020; Kafai et al., 2020) have made efforts to categorize and make sense of such efforts that foreground criticality in their teachings and address the societal and ethical concerns technological innovation presents, while equiping educators and practitioners to use these approaches. As with any emerging academic endeavor happening across disciplines, there are some debates of the exact meaning of criticality, literacy, and even computing (Morales-Navarro & Kafai, 2023; Kafai & Proctor, 2022); the intentionality behind these efforts, however, to position young people as agents of change within a system that does not always take their opinions into account, is ever present in across these efforts. Echoing the emancipatory teachings of Friere and Macedo's model of literacy (2005), educators are working with youth to think beyond designing and using technologies in ways that will inflate someone else's bottom line, but rather urge them to think about the positionality, meaning, purpose and possible harms these technologies bring to their lives and communities. Concepts like "critical computational empowerment", for example, have been suggested by Iversen et al. (2018) as an extension of the more widely known "computational thinking" that permeated curriculums and learning goals around the world. Where the latter is concerned with developing the thought process required to interact successfully with computational machines, the former describes the "process in which children….develop the capacity to engage critically, curiously and constructively with the construction and deconstruction of technology." (Iversen et al., 2018). A deeper understanding of the ethical and societal implications of this knowledge are thus needed.

Scholars have explored ways to educate teens that prioritizes the questioning of the moral and ethical implications of technology, testing out strategies and pedagogies that attune to different desired outcomes and contexts. In their recent review of such efforts, Morales-Navarro and Kafai (2023) recognized that these efforts can be categorized by: (1) 'critical inquiry', which centers the analysis of power dynamics and suggestions of possibilities for change; (2) 'critical design', which centers the (re)design with computing in ways that aspire towards justice and change; and (3)'critical reimagination', which centers rethinking the present and the past to critically reimagine computing and technology for more equitable and just futures.

In this paper, we present insights into student learning in a critically minded pedagogy developed in the context of a 6-week summer course for high school. Through the development and teaching of this course, we examine specific opportunities, or launchpads, when our students demonstrated ethical sensemaking as well as examples of what ethical sensemaking looked like in action. This effort is likely to inform future pedagogies designed with critical inquiry goals in mind. Though the world is full of ethical issues that require our pedagogical attention, we chose to focus on technology for its prevalence and impact on young people's lives.

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Theoretical framing

One pedagogical approach that engages youth as active thinkers about the role of technology while promoting the examining and reimagining of existing power structures calls to position youth as "philosophers of technology". Proposed by Vakil and McKinney de Royston (2022), this pedagogical approach decenters core computing practices in computing education without devaluing them. What is pedagogically prioritized is youth learning to wrestle with the multiplicities, inconsistencies, and ethical complexities of technology. Centering the contemplation of ethics with and about technology is therefore the main mode of learning, which cultivates what the authors coin as "technological wisdom", defined as a "form of knowledge that emerges from guided inquiry and nuanced contemplation of the ethical complexities and implications of technology" (Vakil & McKinney de Royston, 2022). Guiding youth to be philosophers of technology is essentially about respecting their intellectual integrity (Espinoza et al., 2020) and ability to think critically about the world around them; a skill that emerges within varying contexts and scaffoldings (Salac et al., 2023; Vakil & McKinney de Royston, 2022).

Consistent with this approach, the field of philosophy for children (P4C) offers techniques to support youth in this type of learning (Trickey & Topping, 2004; Lipman, 1982), and emerged as an approach to engage children in representing, discussing, and working through the fundamentally philosophical questions that they often encounter as they go through the world. P4C requires both the students and their instructors to develop critical thinking skills and good discourse skills -- stepping beyond the recall of facts, it asks to reflect on one's own positionality in the world while listening to our peers speak and respond thoughtfully. These and others are skills that are crucial to develop if youth are to be active thinkers comfortable with nuance and complexity contemplating computing's effects on their lives and communities. Our research and pedagogical design blends both approaches to investigate how students may develop and exhibit ethical sensemaking.

Research context and methods

We developed a novel pedagogical intervention which took inspiration from concepts within *Youth as Philosophers of Technology* (Vakil & McKinney de Royston, 2022) as well as techniques from *P4C* (Lipman, 1982) - as we believe the combination of the strengths of the two techniques may enhance each other and build a promising path for ethical sensemaking for youth about and with computational technologies. In thinking through and building the course with these techniques in mind, we sought to demonstrate what are (1) launchpads, or opportune moments we saw for ethical sensemaking and (2) expressions of said sensemaking.

Context

We implemented our intervention in an elective class within a 6-week summer program (June-August 2023) at a Northwest United States university aimed at students ages 14-18 from local under-resourced schools. Most of the students, as is the aim of the program, were low-income and/or the first in their family to pursue a post-secondary education (i.e., first-generation). The class had 12 participants and 3 instructors (the authors) and met every day for an hour Monday through Thursday.

Methods

Our class design drew from two main frameworks. First, we draw on basic principles of the 'Youth of Philosophers of Technology" (Vakil & McKinney de Royston, 2022) framework: (1) centering the relationality of the subject matter to others, to place, and to sociopolitical realities and histories, (2) highlighting analyses of both the tech stack and the cultural, social, and political contexts in which technology is used, and (3) encouraging design to express ethical sensemaking. Simultaneously, we also leveraged P4C techniques, namely creating a community of inquiry (Lipman, 1982) and adapting tools and lines of questioning from philosophy as age-appropriate scaffolds. We specifically drew from a pedagogical tool called *Moral Prisms*, which offers age-appropriate representations of common Western moral theories (Philosophy Learning and Teaching Organization, 2022). The moral prisms tool prompts students to examine a technology-related dilemma and ask what the given action should be were they to look at the problem through a specific moral prism. For example, the Existentialist prism would ask of a dilemma "What course(s) of action will set people most free?", while the Deontological prism asks, "What would I do if everyone in the world were to do as I did?". Using this tool allowed us to introduce the field of ethical inquiry to the students in an applicable manner, which allowed them to think through multiple dilemmas and question them through these varying perspectives, each foregrounding an ethical stance. Through this, the students were able to reflect upon their own ethical stance in the dilemma discussed.

After we described the risks of research participation (namely discomfort from discussing potentially negative experiences with technology), all 12 students enrolled in our class assented to their classwork being analyzed for research. In the first week of class, students engaged in rapport-building activities to develop a

community of inquiry and collaboratively selected the three topics to cover in the class (one topic per week). To introduce them to the Moral Prisms tool presented above, we discussed a social dilemma centering around computing, and then showcased how a possible solution to the dilemma could be altered by choosing to look at it through one, or several, of the moral prisms. The debate we chose to surface was a local one about the transition to cashless businesses in the students' local area. We did this to model this nuanced ethical contemplation required when thinking through such a dilemma, to then inspire students to develop these complexities further during the rest of the course.

In Weeks 2-4, we covered each of the student-selected topics (data privacy, social media, and AI), adhering to the following structure:

(1) The week started with an activity to introduce students to the topic and its inner workings. As we were looking to avoid devaluing the inner technological workings as part of the holistic understanding needed to develop a nuanced 'technological wisdom' with our students, this portion varied by topic and focused on integrating hands-on activities that would 'pull back' the curtain of these technologies – enough for the students to analyze their ethical implications in varying scales. For example, one activity had the students document what information they could find about themselves online while learning technical concepts like cookies, cache, etc.

(2) After learning about technological working and intricacies of the week's topic, students analyzed a local contemporary issue in small groups through a subset of the moral prisms. Our purpose was to scaffold ethically sensemaking in different ways about issues that were related to them and their communities. In week 2, while discussing data privacy the class discussed a local state bill to protect children's rights in parent-influencer content. In week 3, while discussing social media, the class wrestled with an analysis of an ongoing local public schools' lawsuit against social media companies. And in week 4 while discussing A.I, we analyzed a local bill aiming to ban ChatGPT from the schools the students are attending.

(3) At the end of the week, students presented their analysis to the class, saving room and inspiring several class-wide discussions.

In Weeks 5-6, students worked on their final projects where in groups of 3-4, they selected a contemporary moral dilemma related to computational technology to analyze and designed an alternative future story based on that dilemma.

Our analysis focused on examining the class work the students submitted throughout the course, as well as the daily reflections the instructors filled - highlighting moments of 'deep reflection' and examples of relationality the students exhibited. Classwork included students' end of week presentations, worksheets from the activities, and their final written reflections. Instructor reflected on the state of students' sensemaking, relationships, and their critique of technology and imaginations around alternative possibilities.

Through a mixed inductive and deductive thematic analysis (Hammer & Berland, 2014), we identified instances where we saw (1) opportune moments, or 'launchpads' for ethical sensemaking (2) expressions of ethical sensemaking. Rather than calculating statistical agreement metrics like inter-rater reliability we resolved disagreements by building consensus through discussion, abiding by Hammer and Berland's position on qualitative coding.

Preliminary results

Launchpads for ethical sensemaking

'Launchpads for ethical sensemaking' were instances *when* we observed ethical sensemaking around technology we would characterize as 'technological wisdom', or a nascent sense of it. Students made sense of the moral and ethical complexities around technology when they either (1) made connections to their lives outside the classroom, (2) collaborated with their peers within the community of inquiry, and (3) engaged with the scaffolding of the moral prisms meaningfully. For example, one of the instructors reflected on an instance where the connection to life outside the classroom, as well as peer engagement, made the students think critically about technologies in their lives:

> "We ran into a debate on whether it's ethical or not to look someone up online before going on a date, which focused on if it is "normal" or if it is weird to do so…. [Then] when we did the "look yourself up" activity, some felt like looking someone up on Instagram (or a platform that

> they know and interact with) is more acceptable than literally using Google search to find people" (Instructor 1).

Expressions of ethical sensemaking

Throughout our analysis, we also identified students' expressions of ethical sensemaking', namely *what* students' ethical sensemaking looked like when exploring the ethical dimensions of technology. Students showed their sensemaking through (1) questioning the definitions of values and norms, such as happiness and freedom, (2) rejecting the dichotomy of a binary good and bad with respect to technology, (3) wrestling with dissonance and contradictions, and (4) showcasing flexibility flexible with their principles. For example, one of the students reflected on what they learned throughout the course in their final reflection:

> "Some interesting topics like AI, data privacy and social media are just the few things that can be looked at in both ways to help us achieve our understanding. So there always will be a Yes and No side to the technology we use every day." (P4)

In these preliminary results, we saw students begun making steps towards developing a deep, nuanced understanding of the possible implications and existing structures that surround technologies.

Discussion

The results of our preliminary analysis indicated promising avenues for further developing and expanding on pedagogical interventions that highlight ethical sensemaking around local and contemporary technological related issues to spark the beginning a sense of 'technological wisdom'. Through the explicit identification of 'launchpads for ethical sensemaking' and 'expressions of ethical sensemaking', we hope to inspire both our own and other's explorations of how to shift the narrative around youth and technology, positioning them as deep and critical thinkers on a topic that is so prevalent to their future. Doing so in differing contexts, utilizing young people's lived experiences as well as communal expertise can lead us to foster a generation more attuned to technology's role in society – and ready to face both its positive and negative impacts.

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