PHILOSOPHY OF TECHNOLOGY FOR CHILDREN AND YOUTH II

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ABSTRACT

This unique contribution to philosophy of technology for children and youth (PT4CY) draws on a subset of data from interviews within the scope of a summer camp (n=29). The key interview question is "what is technology?" We note that participants commonly characterize technology as popular devices but they also offer a range of unusual and contemplative responses. This paper focuses on these more unusual responses. The first section provides brief histories of philosophy in the schools and philosophy for children (P4C). The second section gives an overview of PT4CY and presents and analyzes qualitative data through conversational analysis. The paper concludes with recommendations for STEM educators and researchers by stressing the urgency of diversifying questions for PT4CY.

Keywords: *Philosophy of technology, Children, Tweens, and Youth, P4C, PT4CY, STEM*

Although each generation of parents and teachers observe that children are growing up faster, it was not until the late 1960s that the phenomenon was pronounced. It is now common for cultural analysts to ask, "is 10 the new 15?" while pediatric analysts document increases in rates to puberty (Herman-Giddens, 2017; Irvine, 2006). If there once was a time when philosophies of childhood and education could determine what is age-appropriate for children and adolescents, those days are long gone. The gap or wedge between what teachers can teach— regulated as they are— and what children can learn has seemingly never been larger. Media and technology (M&T) are often given as reasons for this. In turn, children are stereotyped as 'heavy users' when it comes to applications (apps) but 'light thinkers' when it comes to implications of M&T.

Rather than theorize age-appropriate content and what children can learn, in this research we \asked a group of twenty-nine children and tweens what they know and think about M&T: we asked them to philosophize. The participants are variously categorized as Generation Z (otherwise classified as iGen, Gen @, and Generation Now), having unprecedented access to digital M&T. Their presuppositions are not *tabula rasa* and their understandings color what they desire, do, say, and see. In this way, we provide a unique contribution to the philosophy of technology for children and youth (PT4CY) (MacDowell, 2015; Petrina, 2020; MacDowell & Petrina, forthcoming). The first section provides brief histories of philosophy in the schools and philosophy for children (P4C). The second section gives an overview of PT4CY and transitions into data analysis. In this section, we profile a subset of participant interviews and voices. The paper concludes by emphasizing the importance of PT4CY along with critical analyses of M&T within Science, Technology, Engineering, and Mathematics (STEM) Education. We stress the urgency of diversifying questions for PT4CY.

PHILOSOPHY FOR CHILDREN (P4C)

Studying and teaching philosophy have nearly always been justified as teaching to reason or think. In a Socratic sense, rather than philosophy, the emphasis continues to be on *philosophizing*. James (1892) said this simply means "an unusually obstinate attempt to think clearly and consistently" (p. 461). Ferm (1936) accentuates the point: "After all, it is not philosophy as such that is the big thing but the joy, the sport, the thrill of philosophizing. οϋ φιλοσοφία άλλά φιλοσοφείνν [Not Philosophy, but philosophizing, Plato advised]. Nothing shall stand in the way of

the student's responsibility to think and to judge for [herself, theirself, or] himself, at every turn" (p. vii).

As progress was made to systematically introduce philosophy in the schools, the emphasis was on both "critical analysis" and "critical thinking." One advocate made a distinction by arguing that "to analyze is to include thinking critically but to think critically does not necessarily include thinking analytically" (Schievella, 1969, p. 3). For the most part, demands were coming from a new type of high school student emerging in the late 1960s. Duvall's (1969) extensive research on teens at the time concluded: "Our youngsters are asking far more candid questions and seeking more honest answers to life's dilemmas in terms of what is appropriate behavior, how do you feel, what are the goals and choices of life itself" (p. 285). As arguments were made for philosophizing with younger and younger students, skeptics countered that children were not yet mature enough. For instance, two countered that "the image of 10-year-old children engaged in philosophical discussions of marriage, death, unemployment, and personal relationships seems, as one colleague has put it, like a recipe for the production of neurotic children" (Jackson & Ott, 1980, p. 104). To be sure, critical analysis and thinking were common in schools through the twentieth century but philosophy courses were not, especially at junior high and elementary school levels (Petrina, 2020).

To change this by creating curriculum for teachers and their young student, Lipman (1976) established an Institute for the Advancement of Philosophy for Children (IAPC) in New Jersey in 1974. His first P4C book for 10-12 year olds (grades 5 and 6), *Harry Stottlemeier's Discovery*, was drafted in 1969 and revised for field research in 1970-1971. Harry Stottle-meier (aka Ari-stotle) and friends reason through how statements can be twisted into truths or falsehoods. In one section, Harry's friend Tony exclaims that if a machine's parts were all small, "that wouldn't necessarily mean that it was a small machine. The parts could be light, and still it could be a heavy machine. So what's true of the part doesn't have to be true of the whole" (p. 66). *Pixie*, another P4C book published in 1981 for 9-10 year olds, explores ethics and freedom. Pixie is home alone with her older sister and sings "free, free, free! Everything's possible!" But big sister reminds her that "there are family rules, and they stay the same whether Mom and Dad are here or not" (Lipman, 2001/2009, p. 38). Used in classrooms, following reading aloud sessions and questions, children are challenged to discuss statements such as "family rules remain the same, whether or not adults are present" and "we are free if we think we're free" (p. 39). P4C "does not tell the child what to think: ultimately, that is up to the child" (Sharp, 2017, p. 26). By the mid 1990s, P4C diffused through 41 countries, from Argentina to Zimbabwe (Lipman, 1997). P4C demonstrates that children 10 years and younger can *think philosophically*, despite concerns (Kohlberg & Gilligan, 1971, p. 1072; Kitchenor (1990).

However much P4C advocacies and curriculum were developed for students facing tremendous technological changes since the 1960s, M&T has been overlooked (Petrina, 2020). Similarly, the philosophy of technology and design, engineering, and technology education have not accommodated P4C despite a wealth of children's literature with M&T content (Axtell, 2017). If "The Sorcerer's Apprentice" is a story of the seduction of technology, how might student philosophers relate this to their lives?

PHILOSOPHY OF TECHNOLOGY FOR CHILDREN AND YOUTH (PT4CY)

Of course, there are instances of PT4CY over the past few centuries. For example, in 1904, Dopp introduced an "Industrial and Social History" series of children's books and sustained their popularity through the early 1930s. "The removal of industrial processes from the home," Dopp (1904) says, deprived children from potent knowledge and compels us to "restore the educational factor that was in danger of being lost" (p. 9). The storybook format, in this case for 6-7 year olds, "is merely a literary device for bringing home to the child the truth that has thus far been ascertained regarding the fundamental steps in the development of our industrial and social institutions" (p. 133). A recent promising initiative in PT4CY is the "Philosophy Short Course"

developed for Irish high schools (Canavan, 2014). Content for the "Philosophy of Science and Technology" strand includes guiding questions such as: "Does technology always advance human wellbeing?" and "Will technology be able to save our fragile earth" (p. 19)?

In our research, we address the core question of PT4CY: What does it mean for children and youth to *think philosophically about technology*? We explore how students and teachers can develop Socratic design, engineering, and technology (DE&T) classrooms, labs, and workshops. If we cannot yet say what characterizes this thinking or Socratic DE&T, we are able to provide insights into the challenges.

We recruited twenty-nine participants (ages 7-13 with mixed gender, ethnicity, and experience) for two intensive one-week gaming and robotics camps at the University of British Columbia. The recruitment flyer emphasized an exciting curriculum for children and tweens to "explore a world of creative possibilities with experienced technology teachers," and specifically to learn how to:

1. Design and program robots using Lego Mindstorms and NXT.
2. Design and make computer games and virtual worlds.
3. Design and produce digital video and still photography.
4. Be a technology researcher in a groundbreaking UBC study.

To ensure that no children were excluded for financial reasons, registration was complimentary (including nutritious snacks and lunch) and we were able to accept all the tweens (fourteen girls and fifteen boys) who registered for *101 Technology Fun*. Although gender was not the focus of the study, there were distinct differences in the girls' and boys' approaches to designing robots.

We wanted to privilege the participants as authorities in their own right, so they were placed in important roles as co-researchers (Goldman-Segall, 1998; Haynes, 2008). For the duration of the camp, instructors and participants were actively involved in videotaping technology interactions, recording field notes, and conducting interviews with each other. Popular interview questions discussed during our recorded conversations include:

1. What are some of your favorite games and what do you enjoy about them?
2. How do you learn to play new games?
3. Tell me your memories of the first game that you played.
4. If you could rid the Earth of one game, which would it be and why?
5. Do you have any stories to tell me about designing with LEGO Robotics?

An immediate challenge for PT4CY is contradicting conventional wisdom (Petrina, 2020). We were especially curious about participants' insights into technology that differed from the conventional wisdom popularized in the media and various textbooks. As the participants were partnered for other activities in the camp, we mobilized them for small group interviews (2-5 participants). We asked them to think and talk about what technology is and means to them. Predictably, some immediately characterize technology as devices but less predictable are the unusual descriptions, which to us indicate serious thinking about the meaning of technology. For example, Jeremy thinks natural beings and things can embody technological features, but Jeff and Darren disagree. Anne and Marie then elaborate on the counter-argument:

> **Jeremy**: Technology can be living cuz some animals have electricity in them, like stingrays and electric eels.
> **Jeff**: No, not anything electric is technology.
> **Darren**: It [technology] has to be [hu]man-made and cultural. Animals are not cultural and can't be technology unless they are a scientific test-tube thingy trying to create life.
> **Jeremy**: [smacking on a wad of gum] My bubble gum is a technology of candy.
> **Darren**: Gum is just a piece of a rubber tree.
> **Anne**: Tree, rock and sun are Nature's technologies and Mother Nature's beauty is just

there, not [hu]man-made, as there is no plug to plug-in to make nature grow. Did you notice that every technology is made out of nature? The [hu]man-made things use nature to make [hum]man-made things, and then use other man-made things to make more [hu]man-made things.
Marie: Chicken laying eggs is like technology: the white egg is like technology eggs cuz you don't know what's inside growing and it's like, "how did this chicken come out of an egg?" If you didn't know about that then you'd think someone must have made the chicks. Kind of like the culture technology stuff the boys are talking about.

Although their values toward technology vary, many participants identify technology as celebratory and positive. For example: “it’s sooooo amazing” (Ayako), “technology has done many things to improve our lives” (Tina). According to Alan, “technology makes things easier in life: the car is easier to travel, the broom is easier to clean and with a phone you can call people… technology helps you to learn and you can take online classes if you can't get to school.” Responses from each child and tween differ and most are initially puzzled, caught by surprise, and unable to instantly contribute their thoughts to the simple question: “What is technology?”

This suggests the participants do not necessarily pause to consider the meaning of commonplace and pervasive M&T. Expressions of ambiguity reflect their immersion, not naiveté. Their views are strongly influenced by branding, marketing, and perspectives of friends; hence we are concerned by a noticeable absence of parents or teachers in participants’ conversations. Certainly, there is a range of differences between the 9-10 year old children and 12-13 year old tweens. Raywin, with her superior store of 9 year-old knowledge, reflects, noting “when I was like 7 or something I was like technology, when you really think about the word, it sounded so boring like with too much complicated stuff so it won’t be any fun, but now I know it’s really fun to learn how to do stuff.” Her level of analysis and observation is advanced, as she notes that “some people walk around like cavemen [and women] not knowing what to do without technology. We use technology every single day without noticing it, but without it we would be like, ‘what are we doing’ and we'd have to make our own stuff.” The group of younger girls, working as co-researchers, elaborate:

Tina: They should make them [hybrid cars] and sell them at regular car price cuz no one can afford them. They can make it in three easy payments like on the home shopping channel [giggles]. Actually, we need less things, not just cheaper, to help global warming, otherwise everyone would buy more if cheaper and that would pollute the earth. They should only make solar cars [pauses] except then only the rich people would have them.
Raywin: It would be really cool in the future if we could start off all over again, except not at caveman time, but when people started figuring out how to make technology and cars. We wouldn’t make the same mistakes like global warming and cigarettes. People liked the smell and thought they tasted good, but then got addicted. Now we keep making smokes even though they are poison.
Ayako: And pollution. If someone threw a cigarette on the ground when I was born, it would still be there cuz it takes twelve years for it to totally degrade or whatever until it’s totally gone.

These girls demonstrate a complex understanding of a good/bad technology continuum as they deliberate opportunities, risks, and appropriate use at home and school. Further, they show their capacities to willfully engage in contemplative dialogue and inquiry, when given the time and space to think about and question technology. What is the impact of PT4CY? Fast forward to 2035 when the participants of this study are old enough to have children of their own, will they look back with dignity or indignity for what technology is, how it evolved and what we made it to be? After

deliberating these questions with the researchers, the group of student philosophers were further challenged to address their concerns through design-based thinking.

> **Paula (First Author)**: What if we make a game, and in this game we are able to start off fresh and re-imagine the world differently, to create a place like the one that you are talking about?
> **4 Girls**: [in unison] Yeah! Oh Yeah! That would be so much fun! Totally Cool!
> **Raywin**: If people play this kind of game and are having fun, then they might think that: "Whoa, maybe we can actually do this!" And the more people who play this game, the more people who will think about taking care of the planet. And maybe in the future sometime, they will actually start doing it.
> **Chani**: Or maybe in the game you get to make something that helps the earth or fights pollution in the world.
> **Ayako**: With technology that is better for the earth, not just what we want and we need and everything like that. Better technology where before we do something, we really have to think twice, to think more about everybody, not just yourself or a few people, but everybody and everything.

CONCLUSION

This is a unique contribution to PT4CY and its core question: What does it mean for children and youth to *think philosophically about technology*? We report on research with a group of children and teens, focusing on how they philosophize M&T within a learning environment where their ideas, reasons, and ways of thinking are valued. We present and analyze data collected through small group interviews that addressed the question, "what is technology?" We note that participants are quick to characterize technology as popular electronic devices, including, a camera, cell phone, computer, Game Boy, PSP, Wii, DDR, wristwatch, and Xbox. We presented the more unusual responses that suggest they are seriously thinking about what else technology might mean. While the depth of participants' desire and enthusiasm for consumption of brand-specific commercial technologies is troubling, the small group interviews reveal that they are philosophizing M&T in complex and unexpected ways. We try to capture the diverse and subtle ways that children and tweens generate meaning of M&T. While these selected examples do not tell the whole story, educators and researchers need to address concrete examples of M&T constraining, mobilizing, and tempting children and youth (MacDowell, 2015; Petrina, 2017). It is equally important to listen to how they philosophize M&T using argumentative skills, reasoning, and questioning. Questions directed to each other were quite complex. Inasmuch as their questions show inquisitiveness, they are as important as the answers provided (Nye, 2006).

It is notable that the children and tweens enjoyed philosophizing M&T. The tween boys' conversation about technology lasted for over an hour and they were surprised and somewhat disappointed to find out that we had run out of time. There were spontaneous exclamations: "That was so fun!" "Do we get to listen [to the recording]?" and "I really enjoyed that." Thinking philosophically about M&T can be as fun as building robots and playing popular entertainment games. STEM educators can effectively utilize youth interest in philosophical inquiry to ignite engagement in the significance of STEM curricula. Youth can figure out for themselves the meanings, reasons, purposes, and values without over-reliance on course texts. They can learn from the diverse perspectives of peers, as well as come to know that they have the ability to negotiate and change their views over time. This meta-cognitive course of action requires awareness of one's thinking and deliberate self-examination of what it thought, which encourages learners to develop their philosophies of STEM education, and their ways of thinking about STEM in the world. The goal is for children and youth to develop philosophical habits of mind that contribute to being and becoming thoughtful, reflective, empathetic, and reasonable citizens.

Key challenges for PT4CY and STEM education include diversifying questions and answers that draw from, for instance, African, Chinese, Indian, and indigenous philosophies, traditions, and wisdom. How can PT4CY help make wisdom teachable and learnable (Van Norden, 2017)? However much we are challenged to design STEM curriculum for "Traditional Ecological Knowledge and Wisdom" (TEKW) we are doubly challenged by Traditional Technological Knowledge and Wisdom (TTKW) (Turner, Ignace, & Ignace, 2000). One of our participants (Dan) insightfully reasoned that "90% of people in Ghana use firewood to cook, and for them that is a new technology if 90% of them are still using it." Whether this or that technology is old or new for Ghanaians is not quite what the tweens were debating. More profound is the fund of Ghanaian philosophies of M&T that might inform DE&T and STEM education.

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