Philosophy of Technology for Children and Youth

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Abstract This chapter addresses philosophy in design and technology pedagogy. It problematizes philosophy as a guide and resource for pedagogy and instead explores how children and youth philosophize in a process of designing and making. This chapter provides a brief history of the Philosophy for Children (P4C) movement and questions its neglect of design and technology. In response, this chapter explores the philosophy of technology for children and youth (PT4CY). Philosophy may be defined as a "love of wisdom" but in the real world of designing, engineering, and making, philosophy often reduces to a "love of conventional wisdom." Examples of this are provided along with a research vignette of PT4CY. This chapter concludes with the juxtaposition of disruptive technologies, wherein children and youth are configured as experts, and slow pedagogies, wherein parents and teachers may intervene with spaces and time for philosophizing.

Why do children, overdetermined with gifts, fail to develop into adults that have in their interest a world that the next generation actually needs? We've heard for a century that "children are natural artists" and "natural scientists." In the anthropocene, children are found to be "natural conservationists" and "natural environmentalists." It is often asserted that "children are natural designers," "natural engineers," "natural inventors," "natural makers," and "natural technologists." Increasingly since the 1970s, we are told that "children are natural philosophers." The gifts that children bear in this world are abundant. With a twenty-first-century turn on the eternal truism that "the child is the father of the man and mother of the woman," we consistently resolve that "students know more about technology than their teachers"

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(Ebner, 2017). Repeatedly, we are reminded that "children are savvy users of technology before they even start preschool" (Kellahan, 2016). Equally infantilizing is a newfound sentiment that "technology is child's play." Similarly, it is no mystery why we are told that childhood holds a key to innovation and "thinking like a kid" unleashes potential for the creativity desired of entrepreneurs and technology mold breakers.

All these inferences give one pause to wonder, is there anything at all that pedagogy and philosophy can offer children that they do not already have or know? What exactly can education offer children if they are natural designers, engineers, inventors, makers, and technologists? Or worse, do pedagogy and philosophy eradicate or waste these natural gifts? "With the years," says Jaspers (1954), "we seem to enter into a prison of conventions and opinions, concealments and unquestioned acceptance, and there we lose the candour of childhood" (p. 10). Indeed, it has become common sense that schools – especially secondary schools – disrupt and stifle children's natural development and quash their innate gifts of creativity and criticism. Why then is it a paradox that in a transformation of youngster and youth to adult is the loss of the gifts and wisdom necessary to obligations toward future generations (Qvortrup, 2009; Weiss, 1990)?

This chapter addresses the entangling alliance of pedagogy and philosophy in design, engineering, and technology education and focuses on the philosophy of technology for children and youth (PT4CY). Philosophy for children (P4C) generated a range of curricula and pedagogical techniques since the 1970s but has yet to attend to design, engineering, and technology education. Although acknowledging for over a century that children are natural makers *and* philosophers of technology, teachers and theorists of design, engineering, and technology education have not formed an alliance with P4C or developed curricula and methods for PT4CY. One gets an uneasy, false sense of security in scenarios wherein PT4CY is otherwise left to the children and youth alliance with commercial enterprise. The first two sections provide brief histories of philosophy in the schools and P4C. The third section gives an overview of PT4CY, focusing on the void of philosophy of technology in P4C over the past 40 years on one hand and the void of P4C in design, engineering, and technology education on the other (Lipman, 2001/2009; Naji & Hashim, 2017). This section builds on the review of research and provides a variety of leads into PT4CY for advanced development of curriculum and pedagogy (C&P) or instruction (C&I). This chapter concludes by considering Barlex's (2017) challenge to account for disruptive technologies in design, engineering, and technology education practices by asking if this necessitates a counterbalance of slow, soothing pedagogies and philosophies. But for all we hear about natural tendencies toward distraction and "twitch speed," one might just as well propose disruptive, spontaneous, turbulent pedagogies, and philosophies. If children are naturally gifted and suited to philosophy in various ways, why are they ultimately unable to preserve wisdom or transfer this to sustainable design, engineering, and technology education as they age?

1 Philosophy for Children and Youth

In one of his early analyses, James (1876) asserted that philosophy for students "means the habit of always seeing an alternative, of not taking the usual for granted, of making conventionalities fluid again, of imagining foreign states of mind" (p. 178). Half a dozen years later, Dewey (1893/1967) defended arguments against teaching philosophy in the schools if this amounted to "conscious moralizing" (p. 222). Qualifying the argument, he reasoned that if ethics was alternatively defined as "human relationships in action," then it is "not only teachable, indeed, but necessary to any well-adjusted curriculum" of the schools (p. 223). Any "college undergraduate course in philosophy at the introductory level," he conceded, "can be successfully taught to bright high school seniors" (p. 247). Dewey explored a range of definitions of philosophy over his career and eventually acknowledges that, yes, "philosophy is *love of wisdom*" if wisdom is understood as "knowledge-plus" (1949, p. 713). In turn, for this chapter, pedagogy is defined as translating or rendering knowledge-plus teachable and learnable.

In one breath, philosophy is indispensable to pedagogy. The consequences of misapprehending this may be dramatic. "Based on a wrong philosophy, educational research can wreck" a country, Newlon (1923, p. 112) exclaimed with a bit of flair. In another breath, philosophy is entirely dispensable. By most counts, pedagogy does not need philosophy, if it ever did. For instance, over the past 200 years, philosophy has only sporadically been offered as a course in the schools and philosophers seldom write about curriculum design. Historically, philosophy served various roles, ranging from "handmaid to theology" to "queen of the sciences," and by the twentieth century its place in schools was basically reduced to service or questioned as inaccessible. "There are those who claim that philosophy itself has ceased to have any unusual or even worth-while function to fulfill in the modern world," an analyst sarcastically reported in the depths of the Great Depression (Schilpp, 1935, p. 231). He continued: "The day of empirical science spelled the doom of philosophy as surely as it spelled the doom of religion and mythology" (p. 231). Still, educators were challenged to accommodate James's insights into its potential for students as well as the tendencies of children to make critical observations or explore deep questions and theological problems.

The problem of philosophy in the schools was persistent across the world. In UNESCO's (1953) survey of *The Teaching of Philosophy*, only a few countries reported on courses in the schools and fewer on technology as a subject for philosophy. The most robust was the French system, wherein "*lycées* and *collèges* (secondary schools), the last year of study is devoted to philosophy (in the philosophy class) or includes compulsory courses in philosophy" (Canguilhem, 1953, p. 53; Goldstein, 2013). Similar conclusions can be drawn from the American Philosophical Association's (APA) (1958) study of "The Teaching of Philosophy in American High Schools." The APA countered excuses "that boys and girls of 15, 16 and 17 are intellectually too immature to understand and profit from the study of philosophy" but also cautioned that "high school teachers are, for the most part, simply incompetent to teach philosophy" (pp. 95, 97). If separate courses were unfeasible, integrated, or "interstitial," philosophy was a solution. Given newfound student interests if not newfound students, the inclusion of philosophy in the schools increased through the 1960s the world over. The resurgence in "humanities" courses helped the cause of philosophy at this time. Surveying departments of education across the United States (US), Glass and Miller (1967) asked "whether philosophy or any [encompassing] course (Humanities, Great Books, etc.) is taught in schools of their state" (p. 228). About 57% responded yes while 37% said no, as they were either unaware or certain these types of courses were not taught. Despite a brief run of 3 years (1975–1977), *The Journal of Pre-College Philosophy* signified the emphases on pedagogy in the 1960s and 1970s. But perhaps the most noteworthy signs were Lipman's (1976) Institute for the Advancement of Philosophy for Children (IAPC) (est. 1974) in New Jersey, *Metaphilosophy*'s special issue on P4C (Bynum, 1976), and Lipman, Sharp, and Oscanyan's (1977) *Philosophy in the Classroom* (Ayim, 1980).

2 Philosophy for Children (P4C)

P4C is based on a figure of the child philosopher (Kohlberg, 1968; Piaget, 1931) and children's inquisitiveness or propensity for wonder and problem posing, often prefaced with "why?" It began with *Harry Stottlemeier's Discovery* (Lipman, 1971/1974), a children's book (grades 5 and 6, 10–12-year-olds) drafted in 1969 and revised for field research in 1970–1971. "Logic," "philosophy," and "syllogism" do not appear in the text but are ever present as Harry Stottlemeier (aka Aristotle) and friends reason through how statements can be twisted into truths or falsehoods. For instance, 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*, a P4C book published in 1981 for 9- to 10-year-olds, explores ethics and freedom. Home alone with her older sister, Pixie sings "free, free, free! Everything's possible!" But she's reminded that "there are family rules, and they stay the same whether Mom and Dad are here or not" (Lipman, 2001/2009, p. 38). Following reading aloud sessions in class and questions about the book, the children are then 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). Sharp (2017) asserts that fundamentally, P4C "does not tell the child what to think: ultimately that is up to the child" (p. 26). Challenging philosophical concepts are addressed, she affirms, "but ultimately they have to make up their own minds whether in this particular circumstance lying or divorcing or stealing was the right or wrong thing to do" (p. 26).

By the mid-1990s, Lipman authored eight P4C books, and a range of children's and youth literature were used as an alternative or complement to the IAPC materials (Murris, 2016). P4C had diffused through 41 countries, from Argentina to

Zimbabwe (Lipman, 1997). Schools gravitated to P4C as *critical thinking* became a major goal for educational systems (Facione, 1990). And it was relatively easy and inexpensive, given, as Lipman (2005/2017) maintained, "the teacher needs only one novel for each child, as well as an instructional manual" (p. 8). Despite the saturation of lives with electronics since the mid-1990s, P4C and spinoff PwC (Philosophy with Children) practitioners have overlooked pedagogy to challenge children's thinking about technology. For instance, a section dedicated to "Specialized Uses of Philosophical Dialogues" in a P4C book does not contain any examples of technology as a case study for children and youth (Naji & Hashim, 2017, pp. 67–89). The more expansive *Philosophy in Schools*, with 25 chapters and 300+ pages, offers little to nothing on technology (Goering, Shudak, & Wartenberg, 2013). Similarly, Gilmore's (2016) *Kids Can Think* offers an adequate backdrop but then omits technology from the 24 "scenarios for the classroom" that follow. Design, engineering, and technology education educators readily isolate Lipman's comment that children need only a text for engaging with philosophy as a sure sign of the problem with the pedagogy. A counter is that design, engineering, and technology education has not taken up P4C despite access to children's literature awash with thematic content of their subject (Axtell, 2017). If the "Emperor's New Clothes" provides a model of the child critic, what is in this story that could help us draw out the technology critic from the savvy child?

3 Philosophy of Technology for Children and Youth (PT4CY)

If pedagogy is rendering knowledge-plus teachable and learnable, then of course it is inseparable from philosophy *and* technology. Dewey (1916, p. 386) at one point defined philosophy as "theory of education in its most general phases" but he also defined it as "generalized theory of criticism" (1929, p. ix). Theory, for Dewey, was an articulation of insight and understanding. Albeit elegant in its simplicity, his definition of technology as "intelligent techniques" is limited given a translation into "smart technologies" (1930/2004, p. 218).

Inasmuch as P4C overlooked technology, with rare exceptions, both design, engineering, and technology education and philosophy of technology have overlooked P4C (Pritchard, 1991). Since the 1960s, science, technology, and society (STS_1) and science and technology studies (STS_2) inspired some effort in the pedagogy of philosophy of technology for schools but a reality check is needed. In British Columbia (BC), the STS_1 course (*Science and Technology 11*) for high schools had little interest and was decommissioned in 2018. As it was, neither "philosophy" nor "philosophical" appear in the combined 150 pages of the original and revised "integrated resource package" (IRP) for teachers (BC Ministry of Education, 1995, 2008; Nashon, Nielson, & Petrina, 2008). In turn, BC's (2016) new "Philosophy 12" elective omits technology. In *Teaching about Technology*, de Vries (2005) offers an introduction to philosophy of technology with hopes that teachers will design C&P for their schools. Similarly, *Philosophical, Logical and Scientific Perspectives in Engineering* provides a scope of activities and analyses that could be readily applied to high school courses (Sen, 2014). In sum, we have yet to meet the challenge of pedagogy for PT4CY.

A promising initiative in PT4CY is the "Philosophy Short Course" developed by Ireland's National Council for Curriculum and Assessment (NCCA) (2016) for junior grades in Irish high schools (Canavan, 2014). Currently in the Philosophy course, content for the "Philosophy of Science and Technology" strand is a bit light and tilted toward science. Guiding questions include "Does technology always advance human wellbeing?" and "Will technology be able to save our fragile earth" (p. 19)? "We will need people who are prepared to ask, and answer, the questions that aren't Googleable," a reporter remarked (Blease, 2017).

While education entails helping or challenging students to think, Kohlberg and Gilligan (1971, p. 1072) and Kitchener (1990) cast doubt on assertions that children 10 years and younger *think philosophically*. Kitchenor stipulates that "to think philosophically one must be engaged in... *critical thinking about a philosophical issue*" (p. 425). Thinking philosophically also involves raising burning and puzzling questions yet "one must also be able to think the puzzle through to the end, to advance tentative answers to it, to subject proposed solutions to criticisms" (Kitchener, 1990, p. 419). Doubts and technicalities aside, Mitcham's (1994, p. 1) primary question can be reframed: what does it mean for children and youth to *think philosophically about technology*? What is a Socratic design, engineering, and technology education classroom, lab, or workshop? Clearly, at this point, we cannot say what characterizes this thinking or Socratic design, engineering, and technology education pedagogy.

The upshot of a void of PT4CY is we can assemble curriculum to balance western philosophy of technology canons. Van Norden's (2017a, 2017b) *Western Philosophy is Racist* and *Taking Back Philosophy* are symbolic of an intensification of critiques of undergraduate and graduate philosophy courses. African philosophers' efforts to decolonize curricula via "conceptual liberation" are enlightening for PT4CY initiatives (Wiredu, 1984, p. 35). These philosophers have been especially attentive to the nuances of conventional wisdom and "spontaneous philosophy" (Jacques, 1995, pp. 232–233). The imperative here is extending the spontaneous philosophy of technology of children and youth the world over beyond common sense and conventional wisdom.

4 Conventional Wisdom of Technology

If we provisionally interpret knowledge-minus as *belief* and knowledge-plus as *wisdom*, how might we render design, engineering, and technology education wisdom teachable and learnable? However much we are challenged to design C&P for "Traditional Ecological Knowledge and Wisdom," we are doubly challenged by Traditional Technological Knowledge and Wisdom (Stables & Keirl, 2015; Turner, Ignace, & Ignace, 2000). How might we distinguish between the "wisdom of technology" and the "conventional wisdom of technology" (Lower, 1987, p. 1149)?

Upon introducing the concept, Galbraith (1958) defined "conventional wisdom" as "ideas which are esteemed at any time for their acceptability" or as understandings we accept because we are accustomed to them (p. 6). These are sometimes referred to as "old adages," truisms, or what Ellul (1968) calls commonplaces: "living beliefs, formulas that were repeated and used by everybody as criteria for judgment" (pp. 4–5). An example is "The Machine is a Neutral Object and Man [or Woman] is its Master" (pp. 226–235). "It is a fearful thing to attack this commonplace," he warns, "for it is the base, the foundation, the cornerstone of the whole edifice" upon which the average person elevates "technology, its glories, and its achievements" (p. 226). The neutrality of technology, keeping it under human control, raises implications of "technological determinism" as a recurrent theme in philosophy of technology (Dusek, 2006). As conventional wisdom, this is often stated "technology is neither good nor bad… it is how it is used" (Kranzberg, 1986, p. 545; Richardson, 1974, p. 5). A manifestation is "guns don't kill people; people kill people," repeated since the late 1960s. The reality is first of all, says Ellul, "there is not *one* machine but hundreds of machines" (p. 228). Who actually controls technology as a "network of all the machines," he asks? Ellul has students beginning with logic and questions of "which technologies?" and "who are the humans in control" (Lafrance, 2016)?

Equally entrenched conventional wisdom is "technology is a tool" – "just," "merely," or "only" "a tool." Ascended as high advisors or redeemers, philosophers once reveled in this conventional wisdom: "technology is merely a tool; the direction of its use must be determined by social and political philosophy" (Chen, 1950, p. 130). To what extent do millennial computer and network specialists repeat this conventional wisdom of technology? Dean (24 years old) says "technology is neutral" while Ray (29 years old) confirms that "technology's neutral.... It is just a tool. A gun is not evil because it can be used to kill" (quoted in Tapia, 2003, p. 498). When asked by talk show host Donny Deutsch whether new devices and apps were reinforcing crass individuality and antisocial behavior in young people, Gates (2006) spun the question. "Technology is just a tool," he answered, "to let you do what you're interested in." Melinda Gates (2013) in turn repeated this conventional wisdom in a commencement speech. Microsoft's (2014) infomercial during the Super Bowl then raised the stakes on the question "What is Technology?" Today, a student might inquire whether their design, engineering, and technology education course might better be titled hoplonology, organology, or toolology, the study of tools (Canguilhem, 1947/1992; Montagu, 1976, p. 270). A professor might still complain that if we design a course for design, engineering, and technology education, why not "develop a course in "pencil literacy" which would include learning what pencils are made of, how to sharpen them, and perhaps how to sign one's name" (Papert, 1996a, p. R01)? A critical theorist might leap to instrumental rationality: "In a socialist system the worker maintains [her and] his dignity and self-respect, while under capitalism [she or] he is just a tool or instrument to be exploited" (Nettler & Huffman, 1957, p. 53). This conventional wisdom of technology takes for granted that we know what a tool is or does. Logically, if "a doll is a tool" then "technology is just a doll" (Bronstein, 2017, p. 143)? There is a reservoir of examples and implications PT4CY (Petrina, 2017).

Conventional wisdom of technology also includes "necessity is the mother of invention," "technology is advancing," "technology is technology," and "technology is natural," or "technology is a natural part of children's lives" (Petrina, 1992). An urgent challenge for PT4CY is conventional wisdom, not wee wisdom or juvenile wisdom, as Piaget (1931) implied. What additional adages do students and teachers introduce into classrooms?

5 Research Vignette

Our PT4CY research participants (aged 7–13) indicate that their spontaneous philosophy of technology ranges from mundane to extremely sophisticated (MacDowell & Petrina, 2020). Some are quick to characterize technology as devices but their unusual descriptions also suggest they are giving serious thought to what technology means. For example, Jovan sees technology as something new and superior while Dan disagrees:

Dan: [interrupting] it's like saying I invented paper, and it's a technology, but in twenty years from now it's not a technology. We still use paper don't we? It's still something you use.

Jovan: Yeah, but it's not technology anymore. Technology is when you discover a thing for the first time.

Dan: Yes, but I find that technology is the same. Right now, you would say a computer is technology, right?

Jovan: This is a new computer [points to an iMac] and it is now the technology. The old one is not technology anymore.

Dan: I agree, but I think the old things are still technology, cuz you still use them. If this [iPod] is five years old, would you throw it in the garbage cuz it's five years old and it's not technology anymore? Technology is something you use as a form of like [pauses] as a tool. Like, let's say, fire.

Jovan: You know what, you are confusing electronics and technology. Technology is the *new* thing.

Dan: People are still using fire right?

Jovan: Yeah, but it's not technology. You are confusing technology. It's not the thing that you use. Technology is an abstract thing. It's the thing that is first, the best thing.

Dan: Well, you are basically saying that technology is a new invention. I find you are not saying that technology is technology.

Jovan: [talking excitedly] Technology is the new thing, the best thing in every capacity, every time. It's not just a thing – it's an abstract thing.

Dan: This subject is really weird. Like in a good way [smiles].

In another interview, Marie describes the problem of the ontology of technology with an insightful alternative to the black box concept. Technology is like a chicken egg, she explains, "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."

In *Brain Gain: Technology and the Quest for Digital Wisdom*, Prensky (2012) observes that "technology-based wisdom is something we teach to all our children, starting at a very young age." Yet he seems to mean conventional wisdom of technology. *Three Little Pigs*, he writes, "teaches that those who are wise use better technology…. The wise pig employs the more advanced technology" (p. 47). Drawing the wrong conclusions but on the right topic, *Brain Gain* helps keep open a question of whether technology offers wisdom other than conventional wisdom.

6 Disruptive Technologies and Slow Pedagogies

Nearly each day we hear about the "breakneck speed of technology" and get reminded that kids "operate faster than any generation that has come before" (Prensky, 2010, p. 11). Kids and technology are fast and impulsive while pedagogy and philosophy are slow and contemplative, conventional wisdom holds. Pedagogy and philosophy's slow adoption of kids' and new technologies' spontaneous adaptation to one another is proof positive, we are told (Prensky, 2010, pp. 9–10). Philosophers and teachers grew up pulling wagons around, just like medieval children, while kids now "sitting in their classes grew up on the 'twitch speed' of video games" Prensky, 2001, p. 4). Ancient philosophers and teachers time traveling to our contemporary classrooms "might be puzzled by a few strange objects" but "could quite easily take over the class," it is said (Papert, 1993, pp. 1–2). We often marvel at the achievements of kids and technology in spite of the laborious nature of pedagogy and philosophy. Kids and technology roll with Zuckerberg's (2010) wisdom, "move fast and break things," whereas pedagogy and philosophy are preoccupied tinkering with what cannot be fixed.

Barlex's (2017) C&P of "disruptive technologies" for design, engineering, and technology education and PT4CY is refreshing and unique juxtaposed against volumes offering the C&P of "disruptive students." For example, Barlex challenges students to distinguish between conventional wisdom (a drone or nanobot is just a tool) and deeper insights into disruptive technologies. Design, engineering, and technology education and PT4CY are challenged to complement turbulent, disruptive pedagogies, including racing outside to remotely control drones, with slow pedagogies, such as asking students "what do you think needs disrupting?" and providing scenarios to develop sophisticated critiques (p. 225). Another option is weighing consequences of a potentially disruptive technology. The Nuffield Foundation, for instance, encourages students and teachers to identify how or why "winners and losers" are persuaded to accommodate disruptions. Indeed, the challenge is acknowledging that design, engineering, and technology education is practical *and* philosophical.

7 Conclusion

This chapter confronted a bifold problem: The adultification of children and infantilization of technology (Lafrance, 2016). An untimely convergence means the duty to teach technology is progressively passed to "children." Since the early 1980s, it became increasingly difficult to distinguish whether the sages of technology are cyberpunks of fantasy or children of reality (Leary, 1988). When Papert (1996b) was asked, tongue in cheek, if a 2-year-old was smarter than mom and dad, he answered "we're trying to hurry along children to think like adults, whereas we'd do much better if we got more adults to think like children" (p. 100). As Turkle (1984, pp. 29–63) envisioned, with artificial intelligence (AI) the burden of wisdom is further lifted as machines relish the role of new, youthful philosophers. With emphases on contradicting the love of conventional wisdom, this chapter noted a relative absence of technology within P4C and philosophy in secondary schools. Is it not time for children and youth to study *and* do philosophy of technology?

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