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Technology in the Classroom: A Deweyan Perspective

*Heather E. Davis**

I was at a conference a couple of years ago, and the University of North Carolina was presenting some “virtual classroom” for which they’d paid like a zillion dollars. Essentially, students would interact virtually using expensive technology which they placed on their heads. When two of the students in the presentation turned to speak to one another, the presenter admonished them, “Use the technology to talk: this is a *social* experiment.” (A. Lusky, anecdote, September 1, 2011)

Considering the anecdote above, one calls to mind the quote, “Gentlemen, there’s no fighting in the war room” (*Dr. Strangelove or: How I Learned to Stop Worrying and Love the Bomb*, 1964), riffing on the inherent absurdity of the statement. Talking is social. Can talking through a machine make the experience more social? Or does technology instead diminish our social connections? The developed world is at an interesting crossroads with respect to the use of technology in education, not unlike the revolutionary world John Dewey faced when writing his philosophy of education. In fact, Collins and Halverson (2009), in *Rethinking Education in the Age of Technology*, go so far as to compare the “Information Revolution” or “Knowledge Revolution” to the Industrial Revolution (p. 4). They argue this revolution has transformed life as we know it over the course of the 20th century, emphasizing the “computerization of work” (Collins & Halverson, 2009, p. 5) and its powerful influence on all other aspects of society, including the classroom. Whereas the “imperatives of the industrial-age learning technologies can be thought of as uniformity, didacticism, and teacher control, the knowledge-age learning technologies have their own imperatives of customization, interaction, and user-control” (Collins & Halverson, 2009, p.4). Collins and Halverson (2009) quote Don Tapscott, who noted, “For the first time in history, children are more comfortable than their parents about an innovation central to society... They

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are a force for social transformation” (p. 122). Here, again, technological tools are tied to the idea of social change.

Though schools may not be ready to integrate technology into the classroom at the speed recommended by Collins and Halverson, their students are already “there.” Jenkins et al. (2009), describe the current generation of students as being involved in “participatory cultures,” which they define as cultures “with relatively low barriers to artistic expression and civic engagement, strong support for creating and sharing creations, and some type of informal mentorship whereby experienced participants pass along knowledge to novices” (p. xi). They further describe a participatory culture as one in which members feel their contributions “matter” and through which they experience “some degree of social connection” (Jenkins et al., 2009, p. xi). That children are engaged by participatory cultures is not surprising; they appeal to the four instincts that, as John Dewey (1907) described in “The School and the Life of the Child,” characterize children’s behavior: the social, the constructive, the expressive, and the artistic (p. 41). A difference between Dewey’s time and now is that today’s youth expect to participate in learning processes *through the use of technology*—they want a seamless transition from their personal experience to their school experience.

Collins and Halverson argue that educational leaders must “embrace” the use of technology in the classroom so as not to be outstripped by “new forms of teaching and learning outside of school,” such as online private learning and home schooling. Much like the educational leaders of the late 19th and early 20th centuries, if they wish to address “equity and economic development” through the institution of the school, those at the forefront of today’s national education system must adapt their teaching practices to match the pace of technological change (Collins & Halverson, 2009, p. 145).

John Dewey developed a philosophy of education in response to great social changes driven largely by changes in technology. In “The School and Social Progress,” one of a series of lectures describing his educational philosophy as practiced in the University of Chicago Laboratory School, Dewey (1907) wrote, “The modification going on in the method and curriculum of education is as much a product of the changed social situation, and as much an effort to meet the needs of the new society that is

forming, as are changes in modes of industry and commerce” (p. 22). Dewey’s educational “moment” was not unlike our own educational moment. Through the national school system, and particularly in individual classrooms, Dewey envisioned a means to address not only the changes demanded by technology and society—making up for knowledge lost in life within the walls of the classroom—but also to improve the quality of education and thereby the quality of participants in our democracy. He argued for an experiential-based learning system, in which the teacher guides students to learn through carefully selected activities (Dewey, 1902, p. 18). Dewey (1907), a century before today’s advocates for technology in the classroom, wrote of an “intellectual revolution,” arguing, “learning has been put into circulation ... Knowledge is no longer an immobile solid; it has been liquefied. It is actively moving in all the currents of society itself” (p. 31). Nowhere is the metaphor for the mobility of knowledge more clear than the information technologies of today, such as the Internet and its availability on handheld devices. But how would Dewey view the use of these technologies in the classroom?

Certain aspects of information technology in the classroom would likely appeal to Dewey. The social and community-building nature of some technologies, as well as their learner-centered capabilities, might capture Dewey’s imagination. Without a doubt, the opportunities for interactive and engaging learning, in addition to the democratic possibilities of technology, would align with Dewey’s sensibilities. Some aspects of simulation, as well as the preparation of students for meaningful work and lifelong learning afforded by technology, would surely be seen by Dewey as steps in a positive educational direction. As with everything in life, where there is the potential for gain, something may also be lost.

There are currently inequities in the distribution of technology—a fact which Dewey would almost certainly find troubling. And while there are positive aspects to simulated learning, there are risks as well. Technology can endanger the position of “teacher,” a role Dewey considered indispensable to learning. While interactivity and connectedness can lead to socialization, it can also lead to isolation. This final concern relates to Dewey’s philosophy and also touches on broader considerations of technology writers such as William Powers and Sherry Turkle. Both of these writers recognize the benefits of technology while pondering what is lost as a result of its pervasiveness, namely depth

(according to Powers (2010)) and time with each other (as expressed by Turkle(2011)). By considering the benefits as well as the dangers of technology in the classroom through a Deweyan lens, one sees the opportunities and concerns educational leaders face as they consider the inclusion of technology in schools.

The Good of Technology in the Classroom

In modern, developed nations, one is continuously surrounded by social technology. From ubiquitous social networking Web sites like Facebook and Twitter to the world of online gaming and the every day, all day electronic messaging of texts and e-mail, we are all connected, all the time. These connections appeal to our social side—our human longing for community. In his introduction to *Rethinking Education in the Age of Technology*, John Seely Brown discusses the oft-invoked nostalgic image of the one-room schoolhouse—a place for social learning where children learned from each other. He argues that “new social media and social networks ... allow a large-scale form of peer-based, social learning for the world of today’s students” (Collins & Halverson, 2009, p. ix); in essence, a modern version of the one-room school. In describing participatory cultures, Jenkins et al. (2009) note that these cultures shift “the focus of literacy from individual expression to community involvement” (p. 6). Dewey (1938) wrote that most children are naturally “sociable” in *Experience and Education*, describing the nature of work in the “new school,” the progressive school, as “a social enterprise in which all individuals have an opportunity to contribute and to which all feel a responsibility” (p. 56). In “The School and Social Progress,” Dewey (1907) talked of the school as a “miniature community, an embryonic society” (p. 27). Dewey continually argued for learning as a social activity, emphasizing the collaborative, communal nature of the classroom. Technology can cultivate a social experience in the classroom. In fact, networked communication makes what Pierre Lévy calls “collective intelligence” possible. Jenkins et al. describe this process as “like-minded individuals gather[ing] online to embrace common enterprises, which often involve accessing and processing information. In such a world, Lévy argues, everyone knows something, nobody knows everything, and what any one person knows can be tapped by the group as a whole” (as cited in Jenkins et al., 2009, pp. 72-73). Collective intelligence would certainly appeal to

Dewey's views of education as a social enterprise; networking and technology connect students to knowledge, to each other, and to the world. As such, they are inherently social and would likely have been viewed by Dewey as positives for the classroom environment.

Dewey's (1902) philosophy of education was arguably child-centered or learner-centered: "Let the child's nature fulfil [*sic*] its own destiny, revealed to you in whatever of science and art and industry the world now holds as its own" (p. 19). In "The School and the Life of the Child," Dewey (1907) described the old model of education as having a "center of gravity" outside the child (p. 37). He established his new philosophy of education in opposition to this stance. Technology provides an opportunity for greater individual control through customization (Collins & Halverson, 2009, pp. 17-18). In essence, children can exercise greater control over their own learning by using technology; students can follow their interests wherever they lead while learning at their own pace. Increasingly, that learning is interactive.

The references for Dewey and interactive, experiential learning are numerous: it is the biggest "takeaway" for the general public when thinking of Dewey and education. He did, after all, write a book called "Experience and Education," in which he summarized the "one permanent frame of reference" for the "newer education" as "organic connection between education and personal experience" (Dewey, 1938, p. 25). When Dewey (1907) described his learning tool, his "occupations," he explained, "The occupation supplies the child with a genuine motive; it gives him experience at first hand; it brings him into contact with realities" (p. 30). As they describe participatory cultures, Jenkins et al. (2009) write that "interactivity is a property of the technology, while participation is a property of culture" (p. 8). By using these tools, we participate and the nature of that participation is interactive and experiential. "One of the most powerful promises offered by technology is that learning will become more engaging. Education will be directed more toward what people want to learn, and hence, they will be more excited and drawn to learning" (Collins & Halverson, 2009, p. 109). Using simulation software, students could explore a topic such as dinosaurs to create ecosystems which supported dinosaurs, to develop an interactive timeline of the history of the Earth, to simulate a hide and seek game for dinosaur bones based on historic

digs, or to discuss evidence in a forum about dinosaur extinction and evolution. As Collins and Halverson (2009) argue “children would be learning reading, writing, drawing, geometry, arithmetic, history, geography, biology, and paleontology, all in the context of their passion” (p. 124). As active participants in learning, students also experience a more democratic education.

Dewey (1938) wrote in favor of the more democratic methods of the new education over the autocratic ways of traditional education (pp. 33-34). In “The School and Social Progress,” Dewey (1902) promoted a new philosophy of education that bore in mind the best wishes of parents for children. He continued, “Any other ideal for our schools is narrow and unlovely; acted upon, it destroys our democracy” (p. 19). Dewey invoked democratic ideals in his views of education reform, and technology takes democracy in the classroom even further. The customization capabilities of technology allow us to reach children who are currently failing in (and failed by) our schools (Collins & Halverson, 2009, p. 29). Online resources, such as the Open University in Great Britain, offer education to working adults, people with disabilities, and financially challenged students, in equal measure. Students learn online but also take exams and can seek tutoring assistance at learning centers across the United Kingdom (Collins & Halverson, 2009, p. 76). Networking also makes collective intelligence accessible in the classroom. James Surowiecki describes the four qualities of a smart crowd, qualities that demand democracy:

It [the crowd] needs to be diverse, so that people are bringing different pieces of information to the table. It needs to be decentralized, so that no one at the top is dictating the crowd’s answer. It needs a way of summarizing people’s opinions into one collective verdict. And the people in the crowd need to be independent, so that they pay attention mostly to their own information, and not worrying about what everyone around them thinks. (as cited in Jenkins et al., 2009, p. 94)

A decentralized, diverse group of people sharing knowledge sounds like good democracy, as well as a great learning resource, made possible by technology. Children are exploring crowd wisdom in what James Gee (2009) calls “affinity spaces” (p. 10), which Jenkins et al. (2009) describe as different from traditional educational settings in many ways: they are experimental, rather than conservative; innovative, rather than static; they can “evolve to respond to short-term needs and temporary interests,” unlike

institutionalized education; you can leave and return to such informal learning spaces at will. Traditional educational settings offer no such mobility (p. 11). In such informal learning spaces, participants are attracted by common interests: they learn because they want to. It is possible to bring these informal learning settings to the classroom, and to do so would democratize education in ways Dewey might not even have imagined possible.

Another aspect of technology in the classroom which was likely out of Dewey's vision is that of simulation—the use of technology to “render” real and imagined places, things, processes, and worlds from bits of data into immersive, often interactive, and sometimes three-dimensional representations. Dewey (1902), in “The Child and the Curriculum,” wrote of “the map” which “orders individual experiences, connecting them with one another irrespective of the local and temporal circumstances and accidents of their original discovery” (p. 13); for Dewey, the map was a simulation, a representation, of lived experience. And it could be a useful tool in the classroom: “it serves as a guide to future experience; it gives direction; it facilitates control; it economizes effort, preventing useless wandering, and pointing out the paths which lead most quickly and most certainly to a desired result” (Dewey, 1902, p. 13).

For years, simulations have been used in driver's education courses. Students gather in a large classroom, facing a screen onto which is projected an image of driving scenes, from the point-of-view of the drivers. Seated, students grip a steering wheel with accelerator and brake pedals at their feet. They experience simulations of distractions and crashes and receive grades based upon on their reactions, which are monitored electronically. These simulations can be tremendously effective educational tools; students learn how to respond as defensive drivers without putting themselves in any danger (and without the thousands of dollars it would cost to practice crashing in a real car). Of course, students also practice driving in real cars on real roads; as Dewey warned, simulation is not a replacement for experience.

Simulations allow surgeons to “practice” surgery without endangering patients. Simulations allow for the world of dinosaurs to “come to life,” as described earlier. Video games provide simulated environments that often lead to total immersion—a phenomenon that can result in meaningful learning

opportunities. The integration of skill development and usage into a “seamless experience” within simulated environments, such as video games, results in immersion within the environment. Schools, however, separate skills into categories, disintegrating and separating as much as possible; they do not recognize the powerful learning to be had by engaging students in simulations which tap into a variety of opportunities to learn and practice *integrated* classroom knowledge (Jenkins et al., 2009, pp. 23-24).

In making the case for his philosophy of education, Dewey (1907) argued that education should provide children with a meaningful connection to their adult work (pp. 33-34). He also favored learning outside of school and lifelong learning, practices that enrich the individual and society. In *Democracy and Education*, Dewey (1916) wrote, “The inclination to learn from life itself and to make the conditions of life such that all will learn in the process of living is the finest product of schooling” (p. 198). Jenkins et al. (2009) describe a simulation that assesses the “various ways e-commerce affects the environment,” in which students were given the task of “comparing the environmental impact of shipping 250,000 copies of *Harry Potter and the Goblet of Fire* directly to individual customers rather than to bookstores” (p. 71). Through such a task, students learn about economics and the environment, but they also learn what effect a click of a mouse can have, thereby affecting their decisions as consumers in society (Jenkins et al., 2009, p. 71). As discussed earlier, online learning and “affinity spaces” offer opportunities for extra-school and lifelong learning. Outside of the structured, formal school setting, learners can seek information online to learn virtually anything they wish to learn. Many people, for example, turn to the popular, free video Web site, youtube.com, when they want to learn how to do something (from how to tie a tie to how to knit). The popularity of software programs such as Rosetta Stone—a language learning software program which boasts a unique, effective learning style—contributes to the wealth of opportunities for lifelong learning. Part of the popularity of a program like Rosetta Stone is its interactivity and mobility. It is less expensive than most face-to-face language courses and, unlike a face-to-face course, the learner can practice anytime, anywhere. These are the promises of technology in the classroom: learner-centered social experiences, interactivity, democracy, simulated and engaging experiences, preparation for the workforce and life in society, as well as lifelong learning. John Dewey

would likely applaud these outcomes, but what of the inequities? What is lost when technology is added to the classroom? Measured consideration of the effects of technology in the classroom must involve a review of the costs as well as the benefits.

The Costs of Technology in the Classroom

One of the greatest concerns of technology in education today is that of unequal access. Not all children have access to the same amount or level of technology and subsequently not all students have the same access to learning (Collins & Halverson, 2009, p. 106). While classrooms overall provide greater equity than society at large, the digital divide, defined as “the difference in access to computers and the Web between rich and poor, and white and non-white people,” is likely to continue growing, making schools as inequitable as society (Collins & Halverson, 2009, p. 106). In many ways, access to technology is a new kind of cultural capital; if better technology provides better learning, then those who have tech are better educated and able to be upwardly mobile while those without tech are left behind. Dewey, in “The School as Social Centre,” argued that classrooms are “modes of bringing people together, of doing away with barriers of caste, or class, or race, or type of experience that keep people from real communion with each other” (as cited in Johaneck & Puckett, 2007, p. 24). Until schools can bridge the “digital divide,” students are at risk of unequal educations and divisions which will occur along race and class lines—a stark contrast to Dewey’s vision of schools. Another risk of technology in education is that with increased customization, users will settle into groups of like-minded people, losing the diversity and multiculturalism which gives such richness to American culture (Collins & Halverson, 2009, p. 105). If every interest group develops their own curriculum, made possible through advances in technology (as conservative Christians have done for decades through homeschooling) we risk a loss of cohesion in society and a fractured citizenship (Collins & Halverson, 2009, pp. 105-106).

Of greater concern may be one of technology’s greatest benefits: simulated learning. Dewey (1902) warned us that the map is not a substitute for experience, and we would do well to remember (and to teach our students) that simulation is not a substitute for life (p. 13). Online games featuring virtual warfare in South Korea resulted in conflicts in the streets, as the line between the real and the simulated

blurred (Collins & Halverson, 2009, p. 2). Overuse of video games and other simulated environments can lead to health problems and loss of access to “real world play spaces,” while the “mediated experience may squeeze out time for other learning activities” (Jenkins et al., 2009, p. 14). Video games, with their ability to engage, threaten other kinds of learning and growth activities, removing children from active experiences in favor of an interactive, though ultimately passive, simulated lifestyle. Additionally, simulations without critical thinking do more harm than good. Game researcher Eric Klopfer cautions that “simulations enhance learning only when we understand how to read them” (Jenkins et al., 2009, p. 44). In essence, we risk educating generations of students for whom seeing is believing and the software developer is king.

For Dewey, the teacher was essential to education. He wrote, “the educator is responsible for a knowledge of individuals and for a knowledge of subject-matter that will enable activities to be selected which lend themselves to social organization” (Dewey, 1938, p. 56). Dewey left the selection and organization of subject matter to the instructor. He did not trust the child’s interest to guide him or her in the most beneficial direction; this was the responsibility of the teacher. What is the responsibility of the instructor in a wired classroom? Sherry Turkle (2011) references a notion that “old-fashioned teachers who could only do one thing at a time would hamper student learning” (p. 162). In an interactive classroom, where students share knowledge and have access at their fingertips to more knowledge than any human teacher could ever learn, the democratic process risks putting the teacher into the role of facilitator (Collins & Halverson, 2009, p. 42). Collins and Halverson argue that this new kind of relationship can help the teacher form greater bonds with the students, but is facilitating teaching? In the private sector, the rise of Automatic Teller Machines (ATMs) and self-checkout lanes at grocery stores have not resulted in the demise of human tellers and grocery checkers; rather, these electronic options have increased consumers’ convenience. Technology can also increase options and convenience both in and out of the classroom. In contrast to banking and shopping, in the world of education, there are vital skills that a computer cannot teach; as long as school administrators keep these in mind, teachers should be “safe” from technology. Considering the substitution of technology for human interaction brings to

the forefront another concern Dewey might have for the use of technology in the classroom: the risk of isolation rather than socialization.

As previously stated, Dewey envisioned the school as a community, a contiguous part of home life (Johanek & Puckett, 2007, p. 24). The use of technology is inherently social because humans are inherently social; there is a difference, however, between an online game of Scrabble and a family board game of Scrabble. In the first instance, one is alone, interacting physically only with the device—commentary may be shared with the other participants via text or other methods, but the player is typically alone and interaction is mediated. In the latter example, physical space is shared with other human beings, while the tangible objects of the game, emotions, interactions, and reactions are enhanced by nonverbal cues and the full attention of all players is demanded for the duration of the game. Players are discouraged from wandering in and out of play, as they might with an electronic game; the physical presence of other players places additional demands on all players. While both games are social, the virtual one is more prone to induce isolation. Human relationships, particularly those of mentorship in education, increase the quality of our educational experience and enrich our lives. The isolation caused by technology is symptomatic of American society today and worthy of further philosophical consideration.

What We Lose When We are Connected

When Dewey was writing his philosophy of education, and the explanation of the societal changes which demanded it, he described what had been lost through industrialization, but he also mentioned compensations: “The increase in tolerance, in breadth of social judgment, the larger acquaintance with human nature, the sharpened alertness in reading signs of character and interpreting social situations, greater accuracy of adaptation to differing personalities, contact with greater commercial activities” (1907, p. 24). All but the last of these compensations have been lost through the introduction of continuous technological connection in the lives of today’s youth who have grown up in an increasingly connected world and who have been raised in part by technology.

In *Hamlet's BlackBerry: Building a Good Life in the Digital Age*, William Powers (2010) ponders the effects of constant connection to and involvement with “screens,” his “shorthand for connective digital devices that have been widely adopted in the last two decades, including desktop and notebook computers, mobile phones, e-readers, and tablets” (p. 10). He calls “busyness” our “true occupation,” invoking the image of a pinball machine as a metaphor for modern society: “We’re like so many pinballs bouncing around a world of blinking lights and buzzers. There’s lots of movement and noise, but it doesn’t add up to much” (Powers, 2010, p. 13). He describes teens as “barely aware of the third dimension,” citing a new “nature-deficit disorder” to explain headlines such as “Teen Girl Falls in Open Manhole While Texting” (Powers, 2010, p. 55). Constant screen time and reliance on digital tools affect adults, as well. Just this year, a story of a family who called for emergency assistance because they got “lost” in a corn maze went viral after being reported on National Public Radio (NPR). Common sense might have urged the family to walk through the penetrable “walls” of corn to get out of the maze for a little perspective, but this ability to step back and take a larger view is precisely what Powers argues we lose when we engage in screen time. We lose depth: “Depth of thought and feeling, depth in our relationships, our work and everything we do. Since depth is what makes life fulfilling and meaningful, it’s astounding that we’re allowing this to happen” (Powers, 2010, p. 4). Powers cautions against blaming technology in and of itself for this loss; his book samples moments in history when technological advances have caused consternation and fear, noting that none of these advancements has brought an end to civilization. What we must do, according to Powers, is use these tools *as tools* to make our lives easier and to step away from them from time to time to allow ourselves space to connect to each other and to deeper thoughts and emotion. Without retreating from our screens, we face the loss of that which was gained in social settings through industrialization.

Sherry Turkle also writes of loss, isolation and disconnection. She writes of children who have grown up with sociable robots becoming teenagers who obsess over the content of their social networking profiles, “stalking” each other online, bullying each other virtually more so than they ever could in “real life.” There are teenagers who send thousands upon thousands of text messages a month but don’t know

how to have a conversation on the phone (and agonize over the thought). There are adults who spend more time looking at their Blackberry devices than their own children's faces. Senior citizens are being cared for by sociable robots and who text during funerals because they "can't stand to sit that long" without getting on their phones (Turkle, 2011, p. 295). In many ways, *Alone Together* reads like a horror novel, science fiction come terribly true. For many—those truly connected—it might read as a documentary on their own lives.

In describing children's' relationships with robots, Turkle offers a complex story of humanity. She shares an anecdote of taking her daughter to a Darwin exhibit at the American Museum of Natural History in New York:

At the exhibit's entrance were two giant tortoises from the Galápagos Islands ... Here, among the plastic models at the museum, was the life that Darwin saw more than a century and a half ago. One tortoise was hidden from view; the other rested in its cage, utterly still. Rebecca inspected the visible tortoise thoughtfully for a while and then said matter-of-factly, "They could have used a robot." (Turkle, 2011, p. 3)

Taken aback, Turkle (2011) probed her daughter's statement to discover that she felt both concern for the "imprisoned turtle and unmoved by its authenticity" (p. 3). Through her interviews with children and adults who interact with sociable robots, Turkle discovers that authenticity brings little to bear. "Real enough" or "alive enough" is good enough, and sometimes better, than the real thing. But if we are raising children in a world where authenticity does not matter, then how can we expect them to learn the difference between the simulated world of video games and the real world? Can we expect them to care that there is a difference? Turkle (2011) describes the violence enacted by children upon the My Real Baby doll—a robotic doll marketed by its maker, Hasbro, as "the most real, dynamic baby doll available for young girls to take care of and nurture" (p. 47). The gender implications of such a toy with such a purpose are shocking enough, but the aggression the children enacted on the robot babies, shaking them and turning them upside down, is also disturbing. Hasbro built the dolls so that rather than reacting to pain with an emotional response, the dolls shut down. In turn, the baby is "real" in all ways but its

response to pain. Turkle (2011) describes this as learning to kill the virtual, likening it to the desensitization methods employed by the military in training soldiers for war (p. 47). What, exactly, are we preparing children for through these sociable robotic toys?

Turkle (2011) describes how we use technology but also how technology uses and shapes us: “We go online because we are busy but end up spending more time with technology and less with each other. We defend connectivity as a way to be close, even as we effectively hide from each other. At the limit, we settle for the inanimate, if that’s what it takes” (p. 281). Technology is often described as social—online networks that are a source of community. Turkle (2011), turning from her earlier positions, disagrees, “Communities are constituted by physical proximity, shared concerns, real consequences, and common responsibilities. Its members help each other in the most practical ways” (p. 239). She describes growing up on the lower east side of Manhattan where her great grandparents’ block association was marked by “envy, concern that one family was doing better than another; there was suspicion, fear that one family was stealing from another” (Turkle, 2011, p. 239). She continues, explaining that the families also took care of one another, financially supported one another, boarded one another if evicted, buried each other. She questions, “What do we owe each other in simulation?” (Turkle, 2011, p. 239). The great gains of industrialized society are lost when we engage in mediated lives, spending more time with technology than each other. When asked what is wrong with online or computer games, Turkle echoes Powers:

Nothing is wrong with them. But looking to games for amusement is one thing. Looking to them for a life is another. As I have said, with robots, we are alone and imagine ourselves together. On networks, including game worlds, we are together but so lessen our expectations of other people that we feel utterly alone. In both cases, our devices keep us distracted. They provide the sense of safety in a place of excluding concentration. (Turkle, 2011, p. 226)

Here Turkle differentiates games for amusement from games as a substitute for life. People who cannot separate themselves from online role playing games, some of them playing more hours per day than they work, are no worse off than people who cannot separate themselves from their mobile phones,

continually checking e-mail and social networking Web sites. In these games, we all lose because we become disconnected from each other and from living a full life.

But perhaps disconnection from other people *is* what we want. Turkle describes how we animate robots by projecting emotions onto them: “But too often, the unasked question is, What does the robot feel? We know what the robot cannot feel: it cannot feel empathy or the flow of human connection. Indeed, the robot can feel nothing at all. Do we care? Or does the performance of feeling now suffice?” (Turkle, 2011, p. 281). She continues, referencing ELIZA, a computer program developed in the 1970’s that engaged with users through the language of a psychotherapist, “Over years and with some reluctance, I came to understand that ELIZA’s popularity revealed more than people’s willingness to talk to machines; it revealed their reluctance to talk to other people” (Turkle, 2011, p. 282). Can schools reverse this reluctance or will the further introduction of technology in the classroom increase our isolation?

While John Dewey might not have conceived of the extent of our reliance on technology or its rapid boom in the late 20th and early 21st centuries, he certainly considered the effect of technology on society. In 1930, he described the service to humanity technology might provide: “Technology signifies all the intelligent techniques by which the energies of nature and man are directed and used in satisfaction of human needs; it cannot be limited to a few outer and comparatively mechanical forms. In the face of its possibilities, the traditional conception of experience is obsolete” (as cited in Hickman, 2006). Dewey’s quote allows for the connection of technology to humanity and the possibility of a new kind of experience; ultimately, though Dewey may have foreseen a new kind of experience made real through technology, he would have argued for technology to serve humanity by bringing us together, rather than contributing to our isolation. It was the technological changes of the Industrial Revolution that created the communities of modern cities, allowing for the gains Dewey described. It is the information technology of the 21st century that puts those social gains at risk.

Final Thoughts

Like it or not, technology is already in our classrooms. Whether it is the educational tools of the single computer at the front of the room, multi-desktops of computer classrooms, or online learning

software such as Blackboard and e-books, technology is in the classroom. And even if it's not instructional, the technology is still in the classroom: students text each other throughout the day, play games on their phones, and check e-mail on their laptops. The technology engages them; can we say the same for their education? Collins and Halverson (2009) cite a report in which "50% of high school students are bored every day in their classes; another found that 82% of California 9th- and 10th-graders reported their school experiences as 'boring and irrelevant'" (p. 131). Over the course of a century, students are still failed by their education; they are not engaged in active, experiential learning. It is disheartening to know that even Kindergarten, a place of experience and creativity for past generations, has given way, in some places, to standardization, rote learning, and assessments. The challenge facing educational leaders is to find a way to integrate technology into the classroom in meaningful ways that enhance education, preparing students for integration into a computerized workforce and changed society. Moreover, it must be the responsibility of schools to acknowledge the risks and ethical dilemmas raised by technology.

Much like in Dewey's time, if one is to consider a change in the way students are educated—that is to say a new philosophy of education—one must also adjust the curriculum. Collins and Halverson (2009) describe the limited efforts of progressive educators to alter the educational experience using the "conventional tools of curriculum redesign and teacher training" while those who see the good of technology in the classroom believe computers can reach students who fail in schools through adaptability, immersion, and customization. "The challenge...is to build technology into the core practices of the school" (Collins & Halverson, 2009, p. 29). In this light, technology demands curriculum change:

Adolescents need to learn how to integrate knowledge from multiple sources, including music, video, online databases, and other media. They need to think critically about information that can be found nearly instantaneously throughout the world. They need to participate in the kinds of collaboration that new communication and information technologies enable, but increasingly demand. Considerations of globalization lead us toward the importance of understanding the

perspective of others, developing a historical grounding, and seeing the interconnectedness of economic and ecological systems. (as cited in Jenkins et al., 2009, p. 28)

The type of curriculum required to educate global citizens sounds much like the type of curriculum Dewey proposed at the beginning of the 20th century—a curriculum which integrates subject matter and encourages collaboration and critical thinking. Through the use of technology in the classroom, Dewey's philosophy of education and curricular vision could be once again realized, and in ways he could never have imagined, but only if we consider the ultimate goal of education. Richard Rorty (1982), in "Hermeneutics, General Studies, and Teaching," writes that the goal of education is "the sense of human community" (p. 11). Rorty (1982), informed by Dewey, argues that the content of general education is irrelevant, but what must be gained is a "communal romance" which will "permit the students to share their romantic sensibilities, to have interesting conversations with one another" towards the ultimate goal of binding the students together (p. 11). In order to make technology an effective learning tool it must be thoughtfully integrated into the classroom as part of a revised curriculum which must "bind" students together, creating communities, fighting the isolation which technology threatens.

If educators do not mainstream technology into the classroom, students still have access to technology. Some will have greater success than others because of economic inequities. Bill Ivey and Steven J. Tepper, quoted in *Confronting the Challenges of Participatory Culture*, describe the consequences of the digital divide, envisioning a world of citizens separated by a "cultural divide." They argue:

So technology and economic change are conspiring to create a new cultural elite-and a new cultural underclass. It is not yet clear what such a cultural divide portends: what its consequences will be for democracy, civility, community, and quality of life. But the emerging picture is deeply troubling. Can America prosper if its citizens experience such different and unequal cultural lives? (Ivey & Tepper, 2009, pp. 116-117)

Inequity and lack of opportunity are two of the consequences of keeping technology out of schools. As discussed in this paper, though, there are even greater concerns: questions of ethics and what technology does to our humanity.

Technology must be integrated into the schools as it is integrated into our lives, but with this inclusion, lessons must be taught and questions asked not only about the remarkable ways technology transforms our world, our society, and our lives, but also about what technology does to us and how we interact with each other when balancing technology and human interaction. John Dewey optimistically wrote of an education that could capture the imagination of the child, integrate him or her into society and work, and fulfill him or her with the gift of interest in lifelong learning. In his writings, Dewey saw the good in the child, in education, and in society. For those that harbor concern over how technology may be changing us, this goodness still exists, and by harnessing technology, we still have the power to educate for the greater good.

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