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Fire and Water: Meeting the Needs of Digital Natives

“ Knowledge is no longer an immobile solid; it has been liquefied. It is actively moving in all the currents of society itself.” (John Dewey)

“Education is the kindling of a flame, not the filling of a vessel.” (Attrib. to Plutarch)

If you looked around the great common room tucked under the solar panels at the top of the Harley School’s newest campus building, you would notice a familiar scene. Groups of high school students perch on a ledge at the back of the room under the sun-washed rafters, while others find their places on rows of low wooden benches. The noise is deafening. More kids drift in, the boys mostly dressed in jeans and t-shirts, the girls in yoga pants and stylish blouses. Converse sneakers and Birkenstocks are well represented as each newly-arrived student strides across the great space to join their friends. While many kids sit on their own, a little more sleepy and introverted than the rest, for the most part the room is filled with groups of students that form, dissolve, and reunite as kids check in with each other and with the teachers standing against the wall. It is a scene that could have taken place at the school any time within the last fifty years, except for one thing. Almost without exception, every single student has a cell phone in hand. Many students gaze into their own personal devices, thumbs flickering as they type. Others share their phones, huddling in groups around the blue glow of a screen or in pairs, splitting a set of

ear buds as they listen and watch. Until the bell rings to signal the start of morning meeting, everyone in the room, including some teachers, are both physically present and turning their focus out on the electronic world of their screens at the same time. Under the black, mirrored surfaces of our phones, tiny but powerful microprocessors have become an important focus of the everyday routine for almost every member of the school community.

That digital tools have changed the way students think, interact, create, work, and problem-solve is a fact that is only too obvious; the ubiquity of cell phone use before the morning meeting provides a good illustration of the heavy reliance of many students and adults on these gateways to the electronic world. But given the deep concern we have as educators in a small, co-educational, progressive day school to identify student needs and develop a thoughtful and rigorous curriculum that engages their interests and develops their skills, our faculty has become concerned that we have not been keeping up as well as we should with the tools, opportunities, and challenges presented by the students' near constant access to the resources of the web. In fact, as the faculty met to discuss how we should develop a more thoughtful and systematic approach to technology in the curriculum, it soon became clear that we had little understanding of how the students' use of technology had changed their approach to learning. We realized that we had little sense of what the students' needs were in this brave new world of constant connectivity, never mind how to address those needs in our classrooms. The faculty knew that we were in the midst of a profound epistemic shift, but was frankly confused and uncertain about the nature and reach of the changes. In this essay, I hope to explore two fundamental questions raised by the challenges we face: what are students' needs when it comes to the use of

technology and what should we, as teachers and adults, do to support effective learning and development as we plan curriculum?

The early thinkers who influenced progressive education had it easy in some ways. Although committed to nurturing a child's curiosity and character, philosophers like John Locke and Rousseau both advocated isolating a child from the corrupting influence of his peers in order to help each individual develop a sense of values. Locke advised that a child's environment be circumscribed and controlled, and the child kept free of the influences of his peer group or the servants (Locke 46-50). Rousseau had very different aims for the upbringing of his *Émile*, but nevertheless aimed to shelter him for the most part from the deforming influence of socialization (Rousseau). It was John Dewey, for whom the aims of education were "the development of a spirit of social cooperation and community life" (Dewey 305) who began to break down the dichotomies of individual versus social culture, arguing that "the moral education centers upon [the] conception of a school as a model of social life, that the best and deepest moral training is precisely that which one gets through having to enter into proper relations with others in a unity of work and thought" (Dewey 431). Yet even Dewey, who was responding to the radically changing conditions brought about by the expanding effects of industrialization, assumed that a child's education would take place in a limited and controlled social environment. As he describes it in *The Child and the Curriculum* in 1902:

The child lives in a somewhat narrow world of personal contacts. Things hardly come within his experience unless they touch, intimately and obviously, his own well-being, or that of his family and friends. His world is a world of persons with their personal interests, rather than a realm of facts and laws. Not truth, in the sense of conformity to external fact, but affection and sympathy are its keynote (*John Dewey* 340).

Needless to say, children today, many of whom are given their first cell phones in middle school, no longer live in a world of close contacts and personal experience. In the online world, truth, in the sense of conformity to external fact, is no longer a sure and uncontested thing and the “affection and sympathy” of a child’s social world cannot be assumed.

The Harley School is a co-educational day school serving 525 students in grades PreK-12 in Rochester, NY. It is a place where Dewey’s thinking about the aims of education is still very influential. Harley was founded in 1917 when a group of mothers interested in forming an educational program for their four year olds decided to create a Montessori school. The first teacher, who worked cooperatively with parents in the classroom, trained under Maria Montessori in Rome. Today, as the school celebrates its one hundredth anniversary, the mission that guides teachers in their everyday practice and in their development of curriculum is still child-centered, and celebrates the fact that: “We provide a balanced education that prepares our students to meet the challenges of tomorrow and lead lives of great purpose” (The Harley School). Another document, the “Characteristics of a Harley Graduate,” further articulates and clarifies the school’s goals for student learning. It states, among other goals, that we hope each student will become a “civic person...a pluralist (globally aware, tolerant, appreciative of difference); a respectful steward of community and environment; and a compassionate individual who knows what it means to take care of another human being” (The Harley School). Our goals for students address the moral and civic consciousness of the whole child; we are not simply interested in teaching content, but also developing the characteristics and skills that make each individual a good human being: self-awareness, empathy, tolerance, care for others, and active engagement in the community. The school is very proud of its progressive roots; even though the

academic curriculum becomes more rigorous and traditional as students advance into the upper grades, a concern for what it means to be a good person and a good citizen remains central to our educational mission on every level.

Because our value for human connection, social justice, and community responsibility provide a powerful thematic unity to what we teach, technology has not received much sustained attention when it comes to curriculum planning and alignment. In fact, many teachers have suggested that technology use, particularly cell phones, should be more limited during school hours in order to forge stronger bonds and encourage more meaningful face-to-face social interaction. Some teachers are deeply concerned that technology use, on the whole, might be antithetical to the goals of our mission; however, becoming an “anti-tech” school, as some have suggested, is not a rational or a productive option. It does not serve our students’ needs to ignore the profound impact of technological innovation on our lives. Although some teachers have experimented with things like blogging, digital storytelling, podcasting, and educational games, there have been few discussions about a more systematic approach, particularly in the Upper School. The Lower School and Middle School students do have formal technology classes in grades K - 6, which cover elementary computer science, coding, robotics, and digital citizenship, and good digital citizenship is raised in health classes and the mandatory ethics course called “Rights and Responsibilities” in the high school, but on the whole, there has been no real, sustained discussion of how technology might support or hinders our goals for our students. We have no coherent set of expectations for what technological skills students should have mastered by the time they leave our program and little idea of the ways technology might enhance teaching and learning in the traditional subject areas. Crucially, given the negative view of

technology expressed by many adults, there is little understanding of the ways students' use of social media and other platforms might be presenting challenges to our learning goals and mission. I would emphasize that such an understanding must be the necessary foundation to any coherent curriculum planning work.

When the faculty initially discussed how to integrate technology into our teaching more effectively, several points of agreement stood out. First, technology should not be used frivolously for its own sake; the work of the teacher and the formation of strong human relationships should continue to be prioritized. The faculty wanted to explore areas where technology could provide a benefit to pedagogy that could not be reproduced in "analog" form; in other words, it ought to allow students to engage with subject-area content in ways that would be impossible in a non-wired classroom. Second, the use of technology in the classroom should focus on the development of transferable skills rather than the use of particular tools or programs. The pace of technological change is so rapid that it would be a disservice to spend too much time perfecting the use of any one platform or piece of equipment; the only sure thing about technology is that anything considered innovative today will be obsolete tomorrow. Third, the faculty felt it was very important to avoid technology that makes students passive *consumers* in favor of tools and resources that would encourage them to become creative *innovators* and *producers* of new tools and content.

Overall, the faculty emphasized, our use of technology in the classroom should be purposeful, meaningful, and driven by our mission and instructional goals. We had all heard horror stories of schools where, for example, the administration had mandated **1:1** iPad programs that required teachers to engage in professional development and start

using them, regardless of whether or not the new technology provided an improved way of delivering content. It was important to us not to let our integration of technology become the tail that wags the dog. In addition, teachers wanted to be sure that we addressed how students' physical and emotional wellbeing might be affected by their technology use. Some teachers expressed concerns that too much access to technology made it easy for students to become materialistic, to isolate themselves and develop insular worldviews. Others were worried about the addictive nature of certain apps and games. Despite these apprehensions, teachers did acknowledge that the time had come for us to address and respond to the changing forces at work in our students' lives. The faculty agreed that our approach to technology as a school, whether addressing policy or curriculum, should be determined by the needs of the students, first and foremost. There was only one problem. On a fundamental level, we had no real idea of what those needs might be.

It is axiomatic that technological innovations change our approach to knowledge and challenge our understanding of how the world works. Ethnographers and sociologists have pointed out that the development of symbolic systems like writing and mapmaking, production techniques like moveable type and printing, and communication methods such as the telegraph, telephone, radio, and television have not only made drastic changes in the way we communicate and understand the world, but also in how we think and learn (Carr 40-44). As the sociologist Dana Boyd has pointed out though, such innovations require a certain adjustment period. As she puts it, "Any new technology that captures widespread attention is likely to provoke serious hand wringing, if not full-blown panic" (Boyd 14). Change is always difficult; however, the revolutionary transformations in the way we read,

think, process information, and communicate brought about by our use of digital technologies have caused a particularly deep level of suspicion and anxiety in certain quarters. In his 2001 article, "Digital Natives, Digital Immigrants," education consultant Marc Prensky uses the metaphor of indigenous peoples and foreigners to highlight the profound discontinuity in assumptions, practices, and worldview between those people born after 1980 who have grown up within a world of digital technology, and those who may use that technology, but do so from an acculturated outsider's perspective (Prensky). While digital natives take the cultural changes driven by technology in stride, digital immigrants tend to view the effects of technology in suspicious, pessimistic terms.

This is certainly reflected in many relatively recent studies of the effects of the Internet and social media. Sherry Turkle, in her book *Alone Together*, concisely summarized the opportunities and costs of constant access to a network of social connectivity:

Online, we easily find "company," but are exhausted by the pressures of performance. We enjoy continual connection but rarely have each other's full attention. We can have instant audiences but flatten out what we say to each other in new reductive genres of abbreviation. We like it that the Web "knows" us, but this is only possible because we compromise our privacy, leaving electronic breadcrumbs that can be easily exploited, both politically and commercially. We have many new encounters but may come to experience them as tentative, to be put "on hold" if better ones come along.... We can work from home, but our work bleeds into our private lives until we can barely discern the boundaries between them" (Turkle 280).

For Turkle, the ease and scope of connection has caused our relationships to become ever more superficial and the quality of our personal time to diminish. Her thesis is that, despite new opportunities to connect, these connections have caused an increase in loneliness, isolation, and dissatisfaction in our lives. Peter Carr, in his book *The Shallows*, goes further, arguing that the quantity and quality of our social and intellectual interactions on the web have begun to cause physiological changes in the brain as well as changes in our habitual

modes of reading, communicating, and playing. He sees this in a sinister, dystopian light: “While this cybernetic blurring of mind and machine may allow us to carry out certain cognitive tasks far more efficiently, it poses a threat to our integrity as human beings. Even as the larger system into which our minds so readily meld is lending us its powers, it is also imposing on us its limitations” (Carr 214). In other words, our reliance on digital media and electronic devices is changing the way our brains process information and function in fundamentally negative ways. In the view of these researchers, the changes wrought by our reliance on new technologies are frightening; they diminish us instead of enhancing our lives.

While many so-called “digital natives” would admit that their use of technology creates challenges, they tend to see those challenges in terms of their social or work lives, not as a threat to their essential humanity. That is not to understate the historic nature of the shifts that are occurring; they are as momentous as those changes wrought by the industrial revolution that spurred John Dewey to rethink the goals of education. Dewey perceived the challenges presented by the increase in industrialization, urbanization, and immigration in his own day as earth-shaking:

One can hardly believe there has been a revolution in all history so rapid, so extensive, so complete. ... Even our moral and religious ideas and interests, the most conservative because the deepest-lying things in our nature are profoundly affected. That this revolution should not affect education in some other than a formal and superficial fashion is inconceivable” (*John Dewey 297*).

As it was in the late nineteenth and early twentieth century, so it is today. It is important for educators not to waste too much time feeling nostalgic for the past or mourning the loss of a particular way of life; instead, it is imperative to take an inquisitive and open-minded look at how “growing up digital” actually changes the landscape of teaching and learning.

From middle school onwards, most children have cell phones and tablets that give them unprecedented access to things like social networks, online multiplayer games, and world-building games like Minecraft and The Sims that allow them to construct and play with alternate realities. They have access to new sources of information, from search engines like Google, to wikis, online encyclopedias, and Spark Notes; access to educational videos from sources like TedEx, Khan Academy, and Crash Course; access to new sources of entertainment and celebrity from YouTube videos, podcasts, streaming media, and fandoms. Many are being encouraged to tinker with coding, 3-d printing, and robotics kits in well-stocked “makerspaces” set up in schools, libraries, and stores. Technology has profoundly changed the way children learn, play, and create. It is critical that adults and educators not dismiss these changes out of fear, but instead develop an understanding of them and consider how the implications of these new ways of knowing might inform our approach to curriculum planning and teaching. As Maria Montessori suggested, we must continue to “follow the child” if we hope to educate students as effectively as they deserve (Lillard).

Although ethnographers, cultural theorists, and ‘thought-leaders’ in education have drawn attention to the meaning and implications behind the uses of technology by digital natives, teachers hoping to develop a better understanding of their students’ needs for curriculum planning purposes may find it more helpful to consider the work of developmental psychologists who have studied the broad behavioral shifts in how children learn and play. Howard Gardner and Katie Davis in *The App Generation* noticed three major themes when studying how adolescents use the technology available to them. Gardener

and Davis characterize these topics as the three *Is*: creativity and *imagination*, personal *identity* formation, and the development of *intimate* relationships (Gardner 4-5). While the alliteration is a bit forced, the three categories provide a simple framework for understanding the ways technology is changing the ways students approach creativity, critical thinking, and problem solving; the work of constructing and performing a sense of personal identity; and the nature and quality of friendships and social connections.

1. *Creativity and Imagination:*

Edith Ackermann, a developmental psychologist who studied the influence of technology on childhood learning and the traits that children exhibit when interacting and playing with digital tools at MIT's Media Lab, observed several new trends in the way middle and high school students approach learning and creating. Her goal was to avoid what she called "adult projections" of what young people ought to do or want when interacting with technology, and instead develop an understanding of how children actually behave when they play and make things (Ackermann 7). She categorized these new behaviors and modes of thinking and conceptualizing as "sharism," "literacies beyond print," "gaming/simuling," "bricolage," "identity shifting," and "border crossing" (Ackerman 2). Based on these observations, she suggested that it is important for educators and parents to make use the interests and strengths of "digital natives." Crucially, she also noted some key areas in which children could benefit from better guidance and structure from adults (Ackermann 7). Her observations have significant implications for teachers incorporating various kinds of technology when planning learning experiences and assessments for their students.

Ackerman defines "*sharism*" as an "outside in" approach to problem solving. Instead of thinking and planning a project individually before beginning to work, students will tend to mingle, talk, and bounce ideas off each other, whether virtually or in the real world. "Crowd sourcing" – where a student will ask a question of the "hive mind" on his or her social networks – is an online version of this kind of approach. Students often share creative work in online forums before its "fully baked" in order to get feedback and reassurance. Students will form friendships around shared interests, and use these supportive allies as a source of ideas, criticism, and support. If students are not given guidance on the limits of appropriate collaboration, they may not understand where the boundary between original work and intellectual dishonesty lies. They need clear instructions from adults on how to collaborate appropriately and effectively.

When it comes to "*literacies beyond print*," teachers may assume that literacy involves reading and writing, but students frequently do not see themselves as limited to print technologies. Using voice-to-text software and reading apps like Audible, students often bypass traditional modes of producing and encountering texts. They are looking for ways to absorb information and get their thoughts on paper more quickly and efficiently. When they read online, they skim and highlight passages that they may incorporate into their own work later. They sometimes get in trouble for plagiarism, because they tend to collage their sources – cutting and pasting ideas and text, without processing it fully or composing their own original arguments. Students who enjoy writing often engage in imitative endeavors like fanfiction, where they will take on characters and voices from their favorite media, and write plots that borrow from the imaginative worlds of their favorite books or shows. Teachers need to be aware that students need support on how to

use online sources and materials appropriately. It is helpful to make the expectations for originality – as distinct from imitation or borrowing - very clear, emphasize exactly what constitutes plagiarism, and explore the nuances of academic integrity with them.

“Gaming/simuling” has become an important way for many students to relax and unwind. As Ackermann points out, in the world of gaming, you can play and problem solve without the pressure of permanent consequences (Ackermann 5-6). If you fail, you can try again. If part of the game is difficult, you can repeat and revisit your efforts until you master it. Learning in a game environment builds upon itself, feedback is immediate, and risk-taking is rewarded. Although failure is disappointing, a game is a safe way to experiment with problem solving. Gaming is relaxing and social; it is possible to connect and compete with other players. On the down side, some students feel they are addicted to gaming, and find that they unintentionally lose large chunks of time to the game. Some students may give up sleep in order to play games, which can have a detrimental effect on their health and ability to function. Teachers should be aware that gaming provides good practice in persistence, sustained attention, and problem solving, but gaming may also be responsible for a student’s extreme fatigue or difficulty paying attention in class. Some students need adult intervention in managing their time so that gaming does not interfere with other activities.

“Bricolage” is a term that means to improvise using whatever materials are at hand. Students tend to have a tinkerer’s or hacker’s mindset when it comes to working with things. Whether they are crafting, fabricating, or coding, they gather or collect materials, explore new uses for things, and re-use, recycle or repurpose objects and bits of computer code creatively. If they are interested in a project, according to Ackermann, they can take

several approaches depending on the depth of their engagement: 'hanging out' - which involves socialization and observation, 'messing around' - which involves more hands on exploration and tinkering, and 'geeking out' - a long, often shared, deep dive into something they care about (Ackermann 7). Students will tend not to focus on a single strand of a project, but will multitask or work iteratively, although they can direct their attention and enter a state of flow if they become deeply involved in finding solutions to particular problems. Students should be encouraged to slow down and spend some time planning their approaches rather than diving right in. Teachers should seek to cultivate sustained attention, persistence in addressing the task, and a sense of care or attachment to the work.

2. Identity:

As Danah Boyd puts it succinctly in *It's Complicated*, "Just as many middle-class teens use different media artifacts - including photographs, posters, and tchtkhes - to personalize their bedrooms, teens often decorate their online self-presentations using a variety of media" (Boyd 47). Every new platform and every new profile presents an opportunity to create a new online identity, and teens recreate themselves or highlight particular facets of their being in different environments. These different platforms present many different opportunities for self-expression. A user may present one self on Facebook or Twitter or invent an entirely new personality on a fan site, virtual world, or in a game. As Boyd points out, on some sites like 4chan, users can even be anonymous in an arena of discourse where there are few boundaries or consequences for what is posted (Boyd 42). In any event, teens have many opportunities to explore and play with their own identities, as most now exist in multiple worlds at once, including the physical world, the

social world, and a variety of fantasy worlds where they can try on different selves as they interact with others.

There is debate over the implications of this fluidity of identity. Gardner and Davis raise the possibility that an excessive concern for self-presentation may trigger narcissistic tendencies in some students. (Gardner 69). Another concern is that students may not be developing a stable sense of self, instead feeling a lack of control over their internal sense of who they are, and withdrawing into isolation, loneliness, and anxiety (Gardner 77). Boyd notes that it is the nature of some social networking sites for users to literally lose control over what happens to their online selves, for instance, when another user tags or comments on Facebook or on Twitter when a message is retweeted. Boyd calls this phenomenon “context collapse,” when, despite a user’s best efforts, he or she loses control of the original audience and purpose of the performance of self (Boyd 50).

On the other hand, Ackermann notes that students are generally resilient when facing setbacks online. She observes that, “digital natives have a propensity for adjustment to compensate for the unsettling consequences of both desired and imposed displacements. They seek new equilibrium and, to do so, they are inventing their own clever ways to sustain relational bonds beyond territorial borders, navigate under conditions of uncertainty, and remain securely attached” (Ackermann 10). After all, trying on new and creative identities has always been a part of creative play. That said, particularly when it comes to developing a strong and stable identity that is not spread thin across virtual worlds, teachers and other adults should challenge themselves to create opportunities for students to reflect about who they are and what kind of person they want to be. Students should have opportunities to consider how they might respond when faced with ethical

choices, who they admire as role models, and what they might do in a variety of hypothetical situations; it is crucial that teachers create a safe and supportive environment for this kind of work. They should be encouraged to recognize those personal traits that contribute to their sense of who they are, no matter how much creative identity-play they engage in. Mindfulness work and guided meditation, as well as an emphasis on exploring the “authentic self” may help develop a greater sense of self-awareness and confidence.

3. Intimate Relationships:

The ever-present access to a web of social relationships has broadened social circles. Geography and time are no longer barriers to communication; theoretically, your network of friends and acquaintance is always active and always accessible. Ackermann notes that most children live lives “on the go” – always in transition from home to school to afterschool sports and activities (Ackermann 4). Children whose parents are divorced often shift between two homes. Throughout all of their movements, one point of consistency is that interface, which could be viewed as either a connection or an escape, represented by the phones they carry with them from one place to another. Most students are adept at moving their attention seamlessly between the physical and virtual worlds, and their sense of belonging may be tribal (formed with shared-interest groups online) or even global (formed with family and friends who are out of the country) in scope. As Ackermann observes, this may compensate for a sense of rootlessness in the physical world as they strive to find a place and a feeling of belonging (Ackermann 4).

Gardner and Davis suggest that there may be a dark side to our unparalleled access to online social networks, and they “consider the consequences of conducting relationships

at arm's length, round-the-clock, and only with those who reinforce one's worldview (Gardner 93). Sherry Turkle wrote an entire book, *Alone Together*, about the declining quality of social interactions and the increase in feelings of loneliness, isolation, and inadequacy brought on by the superficiality of our online relationships. For teens in particular, as Danah Boyd notes, the jockeying for social positioning and the easy, instantaneous sharing of information makes bullying and "drama" all too common (Boyd 147).

This causes tremendous difficulties for schools when online conflicts spill over into the real world. The weakening of deep social ties in favor of superficial online connections, the rapidity with which groups form and dissolve, the amplification of gossip, the coarsening of online interactions, and the "echo chamber" phenomenon where users only communicate with people who share their own views, have a troubling effect on school culture. If the mission of the school is to teach kids to be productive, engaged, civic-minded community members, the types of social conflicts that arise online present a real challenge. The internet is not a place that fosters loyalty, openness, and empathy. This opens up a crucial area of work for teachers and schools: students need to develop a sense that actions online have real world consequences; they need to feel a sense of ownership over how they communicate online; and they need to practice empathy and an appreciation for others. A school should prioritize ways to create opportunities for students to develop a sense of allegiance both to the community and to the group.

Going back to the Harley School and the students gathering before morning meeting – when looking out at the crowd of young people absorbed in their phones at the beginning

of the school day, it isn't easy to see how teachers might harness the benefits and challenges of technology to teach students how to be "pluralistic" and "empathetic." After all, despite the noise, instead of socializing face-to-face, it is clear that many of the students are absorbed in their devices. It is impossible to say for sure what they are all doing, but a quick walk around the room is eye-opening. Scattered throughout the crowd, several boys hold their phones on the horizontal as they type and swipe; they are playing online games while they wait for the meeting to begin. Although they may appear solitary, this is a social activity; they could be interacting with players from anywhere in the world. Given the occasional shared glances and grins, though, it seems as if many of them are playing and interacting with each other, even if they are sitting in separate locations. Some students are actually finishing papers or homework on googledocs while they wait for the meeting to begin; others are checking SparkNotes to make up for the reading they didn't finish the night before. Others are reading and posting on social media, or – sharing one headphone ear bud with a friend – putting their heads together to watch TV shows, movies, or videos on YouTube. One girl has flipped her camera, and is using her phone as a mirror as she checks her hair and makeup. Another sighs in exasperation as she rolls her eyes: "I wish my mom would stop texting me!" Her friends make sympathetic noises, even as they all type rapidly into their own phones. The teachers at the Harley School trying to cultivate an appreciation of community, a strong sense of personal responsibility, and a value for human connection among the students are facing a revolution as profound and culturally significant as the forces that caused Dewey to react to the challenges of industrialization, immigration, and urbanization one hundred years earlier.

Dewey thought that schools and educational approaches should respond to time and place, as well as social and technological forces. He tried to break down the oppositional dichotomy that, on the one hand, ignored the individualism of the child in an attempt to impose a curriculum that featured a canon of knowledge and information, and on the other hand, devalued a set curriculum in favor of goals to “self-actualize” the child. In trying to find a middle ground between these two approaches, Dewey presciently tried to acknowledge that the pace of technological change was rapid, and it was difficult for the educators of his day to predict what skills and knowledge would be needed in a future marked by uncertainty:

It is impossible to foretell definitely just what civilization will be twenty years from now. Hence it is impossible to prepare the child for any precise set of conditions. To prepare him for the future life means to give him command of himself; it means so to train him that he will have the full and ready use of all his capacities. (*John Dewey* 429).

Twenty years ago, who would have predicted the role that cell phones and personal computing would come to play today? Who would have foreseen a world where all the facts of cultural literacy, if they don't spring immediately to mind, can be accessed in seconds by a few taps on our personal devices?

And yet, looking at the way technology has changed how our students use information, construct identities, solve problems, make things, and form relationships, it is clear that the role of the teacher and a thoughtfully planned curriculum is more crucial than ever. Our current technologies offer many opportunities to improve and enhance teaching and learning. They can help to increase the depth of subject area knowledge, increase student engagement, promote multiple forms of expression, allow for greater collaboration, provide students with multiple ways to learn, connect students to a global world, and

empower students to produce and create meaning. On the other hand, teachers worry that students are lost in consumerism, addicted to games and social one-upmanship, lazy and incapable of deep focus, superficial in their intellectual work, and physically and emotionally depleted by their dependence on social media. In addition, teachers are deeply worried that students isolate themselves through their use of technology, and are losing their ability to dissent as they narrow their own experience and surround themselves with increasingly insular world views.

Dewey has come under fire, sometimes fairly, for a lack of clarity in his writing style that makes it difficult to interpret the meaning and message of some of his educational goals. Richard Hofstadter presented a particularly fair and cogent critique in his book, *Anti-Intellectualism in America*. He pointed out that Dewey never fully explores the specific challenges presented by the American class structure, or the limitations that its structure imposes on educational opportunity (Hofstadter 379). He also points out that Dewey has an unrealistically optimistic view of the supportive potential of a child's peer culture, and little sympathy for those who are more introverted learners (Hofstadter 383). These are valid criticisms; however, one key objection Hofstadter brings up is actually one of the strengths of Dewey's approach. Hofstadter discusses Dewey's sensitivity to the issue of relevance in a curriculum. It is necessary, Dewey points out to subject the curriculum to "constant inspection, criticism, and revision" (quoted in Hofstadter 375) because it does not keep up with the concerns of the present. Dewey further suggests that an unexamined curriculum can be more reflective of adult concerns and traditions formulated a generation or so in the past. Dewey thought the primary aim of education is growth:

We have been occupied with the conditions and implications of growth ... When it is said that education is development, everything depends upon how development is

conceived. Our net conclusion is that life is development, and that, developing, growing is life. Translated into its educational equivalents, this means (i) that the educational process has no means beyond itself; it is its own end; and that (ii) the educational process is one of continual reorganizing, reconstructing, transforming....
(*Democracy and Education*)

Hofstadter puzzles over the meaning of growth in this excerpt, but it seems to me quite simple. "The educational process has no means beyond itself"; in other words, the most important skill a student could develop is learning how to learn. When faced with the uncertainty of how to prepare for an unimaginable future, the most functional skill a human being can develop is an open-minded adaptability to new circumstances and new tools. As we look towards a future of technological innovation, students will need habits of mind that will allow them to be flexible, creative problem-solvers and risk-takers. They will need to be persistent, resilient, and have a strong self-awareness of their own preferred learning styles. Ultimately, they will need to be open-minded and enthusiastic about figuring out how to create and use innovative technologies, and be self-reliant enough to do it by themselves.

The other essential skill is for students to learn how to function in a democratic community. When glancing over Edith Ackermann's observations of the strengths and weaknesses of digital natives, certain patterns appear. The need for a stable sense of identity, for a sense of allegiance to a community and a place in the physical world, the need to develop loyalty, persistence, empathy, care, and a sense of responsibility to other human beings; these are all qualities that can be cultivated in schools. As Dewey envisioned:

It remains but to organize all these factors, to appreciate them in their fullness of meaning, and to put the ideas and ideals involved into complete, uncompromising possession of our school system. To do this means to make each one of our schools an embryonic community life, active with types of occupations that reflect the life of

the larger society and permeated throughout with the spirit of art, history, and science. When the school introduces and trains each child of society into membership within such a little community, saturating him with the spirit of service, and providing him with the instruments of effective self-direction, we shall have the deepest and best guaranty of a larger society which is worthy, lovely, and harmonious. (*John Dewey 310*).

These are lofty goals indeed, but they resonate with the mission and values of the Harley School. Our students, through the devices that give them access to the worldwide web, are already citizens of a global society in ways that Dewey could never have imagined. It is impossible to put that genie back into the bottle. As educators, it is our job to address the specific needs and skills that students will have to develop in order to navigate the multiple worlds they will inhabit safely and successfully. Not only will they need to be good citizens and flexible life-long learners, but also good and ethical humans. School is not the only place they could learn those skills, but it is one place.

To conclude: in order to incorporate technology into our curriculum in a purposeful way, it is important to understand both the needs of our students and the mission and values of the school. Given the Harley School's proud history and commitment to progressive approaches, a fuller understanding of how the students' use of technology affects their approach to learning is vital. Subject area teachers can better meet students' needs if they have an awareness of how students learn, and can engage with them in ways that capitalize on practices they already enjoy on social media. As we have seen, teachers should be sensitive to the need to be very clear on what constitutes academic integrity and the responsible use of information. Even a rudimentary understanding of the transformative forces of social media will show how a commitment to guiding students towards social and civic engagement is more important than ever. It is to be hoped that these understandings will help to revitalize our curriculum, clarify our position as

educators on technology use, give teachers a clear perspective on how to incorporate technology more purposefully into our subject area curricula, and help us refine our program so that we can continue to reach for excellence as we work towards our values and goals.

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