Your Brain Outdoors

By Zabe MacEachren

Introduction

Adults readily note that today's youth encounter different experiences from when they were young. To discuss these differences popular culture has grouped various ages with designated generation titles: Baby Boomers, Generation X, Generation Y, Millennium Child, and so on. Each group becomes understood by the major cultural ideas that influenced their childhood and the dominant technology that shaped perspectives during formative years. The way technology influences a person's cognition is seldom recognized, but is of increasing interest among brain researchers. Outdoor educators tend to pay attention to the way different activities offer different perceptions of an environment. When natural spaces can no longer be accessed, we adapt and simulate natural activities in available spaces. As electronic technology becomes ubiquitous even in the outdoors, we must learn to attend to its influence on us and those we teach.

Advertisers and computer programmers increasingly entice us into desiring their products by taking advantage of what is known about the way our brain functions. They catch our attention by carefully manipulating our sensory abilities with such things as colour, motion, scent and pleasurable tastes designed to trigger positive memories. For people raised and imprinted on nature through time spent outdoors, it can be difficult to spend time watching images on a screen in order to analyze a device's appeal. It is extremely difficult to explain why technology impacts (and alters) the evolutionary path that human brain development has followed through countless generations. Our evolutionary brain development was informed by time spent outside doing activities that directly provided a form of survival, as opposed to responding to images on a screen as a means of surviving school and work. It is easy to be drawn into the enhanced constructs that information technology allows and encourages. We need to be aware of what we are missing in order to make informed decisions concerning technology's use. Like a naturalist, we need to see beyond the camouflage layer to determine if what is approaching is friendly or fierce.

Surprisingly, today's technology is actually helping us to understand such things. Brain research is beginning to track the influence of technology on our brain development. In this article, similar to my conference workshop, I share highlights of a journey I took that lead into reading forages about technology and brain research. It arose from my frustration at trying to teach across generational divides. As I read I reflected on the activities and outdoor skills needed in today's technological time to encourage a shift away from the attraction of the screen and back to the rapture of nature. My aim here is to share highlights of my examination into the way our brain development evolved through outdoor-based experiences and today is influenced by information technology.

Distraction and Concentration Skills

To relate to today's youth, teachers and parents need to understand what influenced their own generation's perception of the world. My professional obligation includes not only knowing how to use media and technology in my work, but also critically examining the way technology can influence us. Backpacking and canoeing both condition a person to determine the value of any item brought on a trip because energy must be expended to carry each item. This means campers (from a generation that grew up tripping with similar values) can readily attend to such questions as "Do I really need this item? Will this item aid my goal of relating well to the place I travel or will it

detract and cause hardship in my experience with nature?" A person who has no or little experience camping may think that many devices are necessary to bring along; such an individual lacks an embodied understanding of how such devices can weigh them down on a portage or actually interfere with establishing a healthy relationship with a place. I recall hearing a story from a solo traveler who once listened to music on his iPod every evening around camp until the day he looked up and saw a bear nearby. This person quickly realized how listening to music was detracting him from noticing the very sounds and things he had wanted to notice when camping. In her book, *Distracted*, Jackson (2008) discusses how children are frequently told to pay attention, but don't really know what that means (p. 258). Creating a common language concerning what it means to pay attention is key and must become "recognized as worthy of life from moment to moment," because we don't get back the time spent noticing other things (Jackson, 2008, p. 259). Examining the reasons why people are distracted from or attracted to a certain technology allows us to make informed choices about whether that technology is worth using.

When outlining the pros and cons of technology I try to use nature metaphors that concern survival skills. Many birds, like loons and killdeers, use the tactic of faking a broken wing to catch the attention of potential prey and thus lead them away from a nest. This tactic is effective only up to the point when the prey discovers that the bird's behaviour is nothing other than a purposeful distraction. Once people are aware of the intentionally distractive behaviour, they can then make informed choices. They can choose not to focus on the distraction and instead concentrate on finding the nest. Jackson (2008) provides an excellent starting point for understanding how modern technology creates distractions in our lives that can lure us away from what we value most in life.

As I became aware of the way technology is designed to distract me and to draw my attention away from chosen tasks to potential advertisements, I began to apply the skills and language I acquired in tracking awareness courses. Similar to playing a survival game in which an individual is asked to rank order the items they would take to survive in a particular scenario, I might ask students what they require to pay attention to something, or conversely what causes the most frequent or significant distractions that are hard to ignore (e.g., cell phones). In *Brain Rules*, Medina (2008) outlines how memory, interest and awareness all play a role in what we choose to pay attention to. I had my flashing incoming email messages turned off on my computer, once I realized how this visual flash capitalized on my primal wiring to readily notice small movements, yet resulted in me wasting time distracted on off-task details that ultimately added stress to my life. In accessible language, Medina explains how detractions affect the executive portion of the brain required for thinking and problem solving. He offers useful data to de-bunk the popular idea that we just need to learn to multitask better. As he reports, "Studies show that a person who is interrupted takes 50 percent longer to accomplish a task. Not only that, he or she makes up to 50 percent more errors." (Medina, 2008, p. 87) Some generations may be more adapt at task switching, but generally our brains require sequential-based processing to work well (Medina, 2008, p. 87).

Turkle (2011) elaborates on the way her research encourages students to realize they are poor multi-taskers and that they are losing their ability to communicate face-to-face because they are developing a preference for texting and other virtual forms of communication. Turkle describes research concerning the way technology shifts or interrupts our attention and creates a virtual world that the young increasingly prefer over the real. Many of her examples come from researching the effects of virtual pets on the young, and of robotic/virtual companions on adults.

While considering both Medina's and Turkle's ideas, I recalled some advice from Tom Brown Jr., author of *The Tracker* and

many other nature-based field guides: Brown discussed when to use focus or peripheral vision when traveling outdoors. Until this time I felt I was primarily conditioned to use focus vision, such as when reading or looking at a blackboard. Brown mentioned that a person should use their peripheral vision 95% of the time when outdoors. The ability to shift between focus and peripheral vision is important during the playing of a game like "Survival," just as an animal needs to focus on food sources and shift to peripheral vision to become aware of danger. Outdoor educators can offer explanations concerning the way many animals benefit from their particular unique visual ability. By becoming more aware of the way our own human vision works, we can make better choices concerning the visual demands of technological devices and their tendency to aid or detract our attention.

Outdoor travelers are well served by being aware of the benefits of both focal and peripheral vision in various situations that require full or partial concentration. In Smart Moves, Hannaford (2005) describes movements that require low levels of concentration yet aid overall concentration. Hannaford describes the physiological basis of the way many movements, especially the movement of the eye, can aid cognitive development. She uses many examples to describe the benefits of various movements and the hazards that may result when movements are stifled. For instance, she describes the hazard to children's eye development when asked too early in their development and for too long a period to focus their eyes, as well as the hazard of spending too much time in rooms where focusing on a distance is not possible. She writes, "Before entering school, three-dimensional and peripheral vision allow the greatest environmental learning" (2005, p. 116). As Hannaford published her book before the development of e-readers, she does not describe any concerns using these technologies. The outdoors with its many non-uniform surfaces provides the richest learning environments. Hannaford helps us understand this so we can use it to rationalize what we do.

Connecting Brain Research to Outdoor Activities

An overarching theme that every brain researcher seems to mention is the role of fitness in proper brain functioning. Medina, who structures his entire book on explaining 12 rules that convey how our brain works, begins with the most influential rule: "Rule #1: Exercise boosts brain power." His book provides a great overview of recent brain research with a wide range of examples and rules in a format suitable for teachers. Ratey's entire book, SPARK: *The Revolutionary New Science of Exercise and the Brain* (2008), provides in-depth details concerning the link between fitness and cognition as well as examples of alternative gym curriculum. Ratey provides new ideas for schools on ways to establish gym curriculum (e.g., mandatory square-dancing class for freshmen, kayaking activities that "serve as social lubricant" and are "crucial to this kind of learning" because they reduce anxiousness" (p. 30)). The emphasis of both Ratey and Medina on fitness as a key to learning inspired me to improve my own personal fitness level while also increasing opportunities for my students to move during my periods of teaching. The rationale they offer expands upon how the oxygen intake resulting from aerobic exercise acts like a brain fertilizer for neuron synapses to prosper. While good explanations of this process is offered in both books, I suggest that Ratey's description of the PE4life program, started at a US high school, should be mandatory reading for all physical education instructors.

If you are interested in learning more about the connection between fitness and the brain I suggest the following: Read Medina's *Brain Rule* (2008) as an introductory text. Use Ratey's *Spark* (2008) for ideas on shifting a standard physical education program that focuses on sports to a fitness program in your class or school. And if you are interested in rationalizing any movement or "alternative outdoor" experience in your curriculum, then use Hannaford's text *Smart Moves* (2005). Hannaford's work provides a more physiological understanding of

the benefits of a wide array of fine-motor movements. She will aid you to rationalize to parents and principals why you allow knitting in class, sitting on physio-balls instead of chairs and climbing trees instead of stairs. Hannaford also describes in details the importance of midlines and the role of using both sides of your brain to access better cognition. *Smart Moves* can serve as a bible for any climber that wants to justify the superior workout involved in the subtleties of their activity.

At the COEO conference I demonstrated an experience of Drums Alive® adapted to an outdoor setting as a possible fitness activity suited to a campfire ring. The aerobic, rhythmic crossing of midlines and group work required in this activity make it an ideal holistic activity (see sidebar for more information). I have become a firm believer that all teachers need to increase students' opportunities to engage in physical activity throughout the day beyond designated gym periods. Our ancestors' brains were developed while walking an average 10–20 kilometres a day (Medina, p. 11). We do not really know what is happening to our brains when we sit for hours behind a screen. The sedentary lifestyle developed through screen watching needs to be addressed, including introducing fundamental changes in school scheduling that allow for more natural movement. The benefit of brain research to outdoor curriculum is that it offers an optimum physical and brain development opportunity that we can use to rationalize what we do.

No Googling = Solo Experiences = Storytelling and Journaling

It was the subtitle of Nicholas Carr's book, *The Shallows: What the Internet is Doing to Our Brains*, that captured my interest. The book follows his examination into the fact that he and many of his peers, who use the Internet for a living, were noticing their own decreasing ability to concentrate deeply. They no longer read long passages and frequently described themselves as being scatterbrained. Carr's description of why he self-imposed a retreat from all media sources to write his book sounded similar to the reasons solo experiences are offered as part of many wilderness programs, and even the new tourism market that limit opportunities for electronic engagement. His book provides accounts of past historical reactions to new technology. For instance, initially people were concerned with the way the introduction of the alphabet shifted intellect from an oral to a literary place that could reside on a page versus in a body through the act of storytelling and dialogue. People were also concerned that too many people would reside just within their own thoughts due to the proliferation of silent reading that resulted once the printing press made books readily available and in turn decreased the need for public and family reading with a single expensive, and thus shared, text. Carr's book sets out to answer the question "Is Google making us stupid?" — the same question he posed in an article of the same name that appeared in *The Atlantic* journal. His answer, *The Shallows*, should be mandatory reading for all teachers because it provides examples and test results that outline the distractions programmed into most computer-based activities. These distractions consistently interrupt the development of deeper thinking skills so people operate daily on a much more shallow level (hence, the book's title). Carr's writing offers to outdoor educators a rationale for oral storytelling experiences to be offered after engaging in outdoor activities that require prolonged periods of concentration and awareness.

Conclusion

Trying to connect my reading about brain research to outdoor education has been a very informative experience. At times I have had to slow down to concentrate on fully understanding the new ideas being presented to me as I also reconnect to past physiology lessons. My own daily habits have shifted as I used myself as a big experiment. Frequently I noticed that I was more mentally alert on days I ate well and got some exercise. The more I became in-tune with an awareness of this healthy state the more I encouraged this same awareness to be reached in the teacher candidates with whom I work. I want future teachers to recognize the lifestyle offset a

that promote healthy brain development and role model this in their classrooms. The outdoor environment is a much richer environment for our brains to learn in than any wired classroom, and learning about the brain can help us articulate this. In short, my instructions to "turn off computers and cell phones" in my classes has become synonymous with embedding my lesson with nature awareness skills.

References

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Zabe MacEachren coordinates the Outdoor and Experiential Education program at Queen's University. She has been known to drum on the side of her canoe late into the night on still, quiet lakes throughout the northwoods.

Activity: Drums Alive® is a fitness program that offers a one-day instructor's workshop on leading drumming and movement sessions using large physiotherapy balls (propped up on step-up blocks). Basic drumming sequences are combined with aerobic dance moves to create a dynamic cardio workout. It was designed by Carrie Akins, a dancer who had to overcome a physical setback. I took this workshop at my local YMCA after watching a promotional video clip and imaging what this activity would be like done outdoors around a campfire. As I do not have access to a class set of large physiotherapy balls, I experimented with Ensolite pads tied to trees and large sponges on desktops. The fundamental movements involved in this activity, the powerful rhythm of drumming, the opportunity to cross midlines to stimulate new neural pathways in the brain and this activity's adaptability to an outdoor environment make it a euphoria for outdoor education. For further inspiration see http://drums-alive.com/