Technology in the Montessori Classroom - Benefits, Hazards and Preparation for Life

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When we think of "technology" in the classroom, our minds today turn immediately to electronic devices – Computers, televisions, PowerPoint projectors, cell phones, iPads, iPods. Technology is a term that refers to much more than this, however. The Cambridge Dictionary defines "technology" as *methods for using scientific discoveries for practical purposes*, and when we consider "technology" from this perspective, a discussion of technology in the Montessori classroom takes some interesting directions.

A critical moment in our history occurred when one of our most distant human ancestors picked up a rock and used it to crack open a nut or a crab shell so that the meat inside could be reached. The first human tool had been invented. We should recognize that the invention of this first, crude hammer also led to the invention of something else almost immediately: The crushed and bruised thumb…that first "hammer" sometimes must have missed its mark and struck its user rather than the intended target! Benefits and hazards accompanied the first tool, just as they accompany our latest technological gadgets, and it is to benefits and hazards that we should direct our attention when considering technology in the Montessori classroom.

That day of creation of the first tool (and of the first tool-related mishap) was also the day on which our ancestors created the field of knowledge that we now call "technology." We speak of *flint knapping technologies* when studying our Paleolithic ancestors. We speak of the *metal working technologies* of the cultures that followed them. We refer to *industrial technologies* of recent centuries. And now we have *information/digital technology*.

From the most simple of beginnings, technology in its many forms has advanced over the millennia. Information/digital technology has been adopted with ever-increasing acceleration.

- The radio was first made commercially available in 1897. Thirty-one years elapsed before at least a quarter of the U.S. population had adopted it.
- Television was first commercially available in 1926. Twenty-six years elapsed before at least a quarter of U.S. citizens had adopted TV.
- The first PC entered the market place in 1975. Just sixteen years later, at least one in four households had adopted this technology.
- Mobile phones were introduced commercially in 1983. Thirteen years later, a fourth of the U.S. population was making calls.
- The internet was made available commercially in 1991. Seven years later a quarter of the population had connected. [1]

We haven't felt the need to think about "technology in the classroom" too much until recently, when computers and tablets and cell phones began to rapidly infiltrate our lives and classrooms. But take a look around any school, Montessori or not, and ignore anything with a screen or a keyboard. Ignore anything that requires a supply of electricity. You will still find "technology" everywhere. Consider two examples that our children use routinely.

- *Scissors*: (Scientific discovery: the wedge … Practical purposes? Almost endless!)
- The *bicycle* (Scientific discovery: Pulley/wheel and axle/gear … Practical purposes? Transportation, sport, fitness, and recreation.)

These two examples of non-digital technology commonly in the hands of today's children have their own benefits and hazards. You can cut and trim a wide variety of materials with scissors… you can also cut your finger. You can travel further and faster with a bicycle than on foot…you can also fall and injure yourself.

Computers, cell phones and iPads are just the latest arrivals in a parade of technology that has been entering our lives for centuries. It is this most recent "technology" to which most people refer when discussing "technology in the classroom." What is interesting about these latest technological advances

is that we often find ourselves considering intellectual, psychological, emotional and social benefits and hazards more than the typically physical benefits and hazards that accompanied previous generations of technology such as scissors and bicycles. Now a band-aid may not be enough if something goes wrong – we're talking about benefits and hazards to young minds!

In his 2014 article "*Steve Jobs was a Low Tech Parent*" Nick Bilton reports that in 2010, Mr. Jobs stated that his children had not yet used the iPad (which was just hitting the shelves) and that he limited how much technology his children used at home. [2] Bilton went on to note that other technology chief executives and venture capitalists had the same child-rearing philosophy.

These leaders in the field of technological devices would likely be first to point out the many benefits offered by modern technology. It is clear also that they are equally aware of dangers that accompany it. We should listen to them. We should also, as Montessori educators, look closely at what "technology in the Montessori classroom" might offer children in terms of potential benefits and hazards.

Let's just take a look at "screen time." Before going any further, we need to understand that this is a slippery concept. "Screen time" is easy to measure (*How many minutes did the child sit in front of the screen?*), but research tells us that "time spent" is not nearly as important as <u>what was going on</u> during that "screen time:" Social interactions online, active game playing on a device, skills drill, keyboarding practice, passively watching some form of entertainment, research, creative writing and editing using a word processor, etc. As the activity changes, so do potential benefits and hazards.

Research that focuses more upon "what was going on" is shedding new light upon some generally accepted benefits and hazards of "screen time." It is also raising new questions. For example:

- A British research project entitled *Do Television and Electronic Games Predict Children's Psychosocial Adjustment? Longitudinal Research Using the UK Millenium Cohort Study* showed that when children aged five years or older viewed TV for three hours or more on a daily basis, there was minimal impact upon future conduct. No impact at all was observed from playing computer games. No impact on other negative behaviors often associated with screen time was observed. [3]

- A recent study presented by Deborah Linebarger at the 2014 American Psychological Association Conference showed that media involving real characters in real situations was associated with <u>improved</u> language development in toddlers, and that the interactions between parent/s and toddlers were a critical component of this development. "*It's content based – not bad or good*," she said. [4]

- The research of Rosie Flewitt showed that children who struggle to learn using books often made more progress with iPads. Her research also showed that iPads helped quieter children to "speak up." [5]

- An October, 2014 UCLA research project *Five Days at Outdoor Education Camp Without Screens Improves Preteen Skills with Nonverbal Emotion Cues* found that sixth graders who did not even glance at a screen for five days performed substantially better at reading human emotions than their peers from the same school who continued to spend hours each day with their digital devices. [6]

- Does regular video game playing contribute to obesity? A number of studies have found the opposite – game players tend to be less obese, more physically fit, more civic minded, and better socially adjusted than their peers who don't play. [7,8]

In his *Psychology Today* blog Peter Gray (whose byline is, coincidentally, "Freedom to Learn") argues for no limitations on computer game "screen time," and some of his arguments are reminiscent of Montessori philosophy:

"Whenever we prevent our kids from playing or exploring in the ways they prefer, we place another brick in a barrier between them and us … Children are suffering today not from too much computer play or too much screen time. They are suffering from too much adult control over their lives and not enough freedom."

"… The computer is, without question, the single most important tool of modern society. Our limiting kids' computer time would be like hunter-gatherer adults limiting their kids' bow-and-arrow time. Children come into the world designed to look around and figure out what they need to know in order to make it in the culture into which they are born … Whenever there's a new technological innovation, kids learn how to use it more quickly than their parents do. They know, instinctively, what they must learn in order to succeed." [9]

So where does all of this leave us?

Firstly, we must recognize that research on this subject is generally carried out in mainstream education settings. Some of the major benefits cited for the use of digital devices in

classrooms include provision of personalized instruction, self-paced learning, and improved access to information for "research". These "benefits" are already embedded in Montessori classrooms, through the materials, the approach and through the elementary *Going Out* program, and so are less compelling as sole arguments for digital technology in a Montessori setting.

We must also concede that the jury is out when it comes to the benefits and hazards of some forms of "screen time." What we have learned is that it's often not so much the screen time itself, it is the activity of the child and the content that appears on the screen that brings benefits or hazards. Also, the degree of benefit or hazard is related to the age of the children interacting with the device.

The argument that no "screens" should be available in our Montessori prepared environments for first plane children finds support. American Academy of Pediatrics guidelines state, for example, that "*television and other entertainment media should be avoided for infants and children under age 2*" at home, school or anywhere else. [10] Children and teens are restricted to one to two hours of quality content. (As a Montessori educator I am far from satisfied with these guidelines. They address only "entertainment media," which is hardly adequate. But at least they're headed in the right direction, and at least they keep these devices away from children under the age of two!)

In the elementary, however, we should return to our original definition of "technology" as we ask ourselves: "Is there a practical purpose for this proposed access to a digital device?" Does it offer an alternative approach that exists in no other format? (Digital art work, for example.) Does a group project (such as an online e-newsletter) require use of a computer? If our answer is "yes", then perhaps access to the computer is warranted for our elementary children.

From the elementary years on, we are probably on the safest ground when we treat digital devices as potential tools for self construction, and when we refrain from introducing them until sensorial avenues have been explored by the children, and exhausted. These devices should be "materials" in the classroom, and they should fully conform to Montessori philosophy and practice. Carefully constructed presentations will be required. Considerations of safety are critical. Access and usage will be moderated by purpose and by the community of the classroom. Access and usage will also likely increase parallel to age, as our elementary children and our adolescents steadily acquire the technological skills and know-how that they need as they take successive steps towards adulthood.

Computers and other digital devices are indispensable to life in twenty-first century society. Our Montessori children must emerge from their schools well-versed in the use of these tools. This is a twenty-first century expression of Montessori's belief that education should be *preparation for life*.

References

[1] K.N.C., G.S. & P.K. (2014) *Happy Birthday World Wide Web*. The Economist. http://www.economist.com/blogs/graphicdetail/2014/03/daily-chart-7

[2] Bilton, N. (2014) *Steve Jobs was a Low Tech Parent*. http://www.nytimes.com/2014/09/11/fashion/steve-jobs-apple-was-a-low-tech-parent.html

[3] Parkes, A; Sweeting, H; Wight D, & Henderson, M. (2012) *Do Television and Electronic Games Predict Children's Psychosocial Adjustment? Longitudinal Research Using the UK Millenium Cohort Study*. http://adc.bmj.com/content/early/2013/02/21/archdischild-2011-301508.full

[4] Linebarger, D; Jennings, N; Piotrowski, J. (2013) *Extending the Lessons of Educational Television with Young American Children*. Journal of Children and Media. Vol. 7, Issue 2.

[5] Flewitt, R; Messer, D; Kucirkova, N. (2014) *New Directions for Early Literacy in a Digital Age – The iPad*. Journal of Early Childhood Literacy. http://ecl.sagepub.com/content/early/2014/05/19/1468798414533560.full.pdf

[6] Uhls, Y; Michikyan, M; Morris, J; Garcia, D; Small, G; Zgourou, E & Greenfield, P. (2014) *Five Days at Outdoor Education Camp Without Screens Improves Preteen Skills with Nonverbal Emotion Cues*. http://escholarship.org/uc/item/4zr41925