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## **Creating Balance in the New Age of Technology**

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Let me start by saying that I am not a Luddite. I was the first person I knew to have a cell phone, and I was reading news from CNN on that phone when the screen was green and 1-by-1½ inches wide. I could text and send pictures but didn't know a single person with whom I could communicate. I was an outlier. I am still an outlier now, but in another way.

Outside of my classroom, I spend time researching and sharing with others why they should consider reducing their involvement with technology. In the spirit of honesty, I should confess that much of the research I read and compile, I find on my iPod. For most of my life, though, I lived without a computer or cable television. No one would mistake me for a technophile; I'm an immigrant in a brave new digital world.

Marc Prensky coined the term digital native in 2001 to describe those who have grown up with a constant interaction with technology, including television, video games, and the Internet. For these people, many of them now in their twenties, life has always included the presence of screens—televisions, cell phones, iPods, video games, and computers. Additionally, digital natives tend to believe they can use many of these devices at the same time and do it very well (multitasking). In fact, in 2010 the Kaiser Family Foundation released its largest, most comprehensive study of adolescents, which concluded that children ages 8 to 18 spend, on average, 53 hours a week immersed in various kinds of technology. In addition, the number of hours spent by children younger than 8 with technology is rising dramatically as new applications for children appear daily, some targeting babies as young as 6 months.

For years, scientists and psychologists have believed that the most vital brain development takes place between birth and 6 years. Montessori herself believed that major sensitive periods during the first 6 years include order, language, writing, and culture, and discussed sensitive periods of development in detail in *The Secret of Childhood* and *The Absorbent Mind*. Humans have always learned about life, language, love, as well as academic imperatives, from other humans. Throughout time, we have been wired neurologically to observe even the smallest micro-muscle movements as we internalize our environments and culture during sensitive periods. Mark Frank, professor at the University of Buffalo's School of Informatics, looked at research from as far back as Darwin on micro-muscle movements and how they express conscious and unconscious behavioral cues (Science Daily). For example, we can tell when a friend is upset by a slightly furrowed brow or pursed lips. As I will discuss later, studies have shown that the use of technology can interfere with our understanding of these micro-muscle movements and associated behavioral cues. Media has brought us unparalleled access to information; however, children in today's world need adults who can balance the benefits of technology with its shortcomings.

While birth to age 6 is the primary age span for brain development, there is a second period of profuse development in the growing brain, beginning around age 11 and lasting for the next couple of years. Teachers and parents must understand the consequences of excessive interaction with technology on children and help them construct the ability to balance the instant gratification of technology with the mind's deeper en-

agement in tasks of mental substance.

The second period of brain development (between ages 11 and 13) provides a second chance for teen brains to construct meaningful cognitive functions. During this period, neural connections “bloom” in adolescents.

Humans are born with more than 100 billion brain cells, but over time, based on usage, our brains “prune” what is not used. Up to 60% of these unused connections are pruned in the teenage years. After this second “blooming and pruning,” the brain is fundamentally wired for the rest of a person’s life, though some pliability is present into our twenties.

Recently, neuroscientists have noticed disturbing study results that suggest that people, especially digital natives, should learn to moderate interactions with media (Kaiser, 2010). Digital natives appear to possess less ability to demonstrate empathy, recognize social cues, focus for extended periods of time on one task, or follow a linear thought without interruption. Conversely, digital immigrants (those of us who didn’t grow up with constant technology access) may have an advantage in maintaining a more balanced relationship with media interface. The idea that one can be so affected by technology seems foreign to many of us over the age of 30, who learned about ourselves, each other, and the world without immediate access to the Internet. Parents who work in technology often do not appreciate the struggles children may face as a result of overuse of television, computers, or video games.

When I suggest to the parents of my students that it may be beneficial to moderate media interaction, they sometimes become defensive. Many believe that in this digital world, proficiency in technology equals success in the future — especially parents who use computers for work on a daily basis or run technology departments at their places of employment. However, it is vital that parents understand the brain research on technology so that they are able to appropriately integrate media use in the home.

Maria Montessori understood the importance of interaction with the world to the development of children. From Childhood to Adolescence, she explained the vital lessons children learn from their surroundings and their experiences as members of society:

"He who arrives at University has left behind him childhood and adolescence: he is a formed person. A great part of his social destiny, of the success of his studies will depend on how he was formed . . . because the person who has never worked, who has never tried to make his own living, who has never mingled with people of different ages and of different social classes, will with difficulty become worthy of becoming the leader of anything."

Further, Montessori understood the importance of interactions between and among humans. In *Education and Peace*, she said, “The individual rarely lives a life entirely apart from others: rather he is meant to associate with many others.” Researchers are substantiating this today, especially as it relates to the relationships among adolescents and media interfaces.

Though today’s digital natives are constantly connected to friends through virtual chats, including texting, instant messaging, or social networking websites, research shows that today’s children, ages 8 to 18, are less able to read social cues, express empathy, or participate in deep conversation. In a recent article in the *New York Times*, Dr. Sherry Turkle writes:

"The little digital devices change not only what we do, but who we are. Texting and email and posting let us present the self we want to be. Human relationships are rich; they're messy and demanding. Email, Twitter, Facebook, all of these have their places — in politics, commerce, romance and friendship. But no matter how valuable, they do not substitute for conversation. FACE-TO-FACE conversation unfolds slowly. It teaches patience. When we communicate on our digital devices, we learn different habits."

Dr. Gary Small, director of UCLA's Memory and Aging Research Center, in an interview for *Frontline*, said the effect of technology on a young developing brain is "much more profound" than on someone older. He warns that neurological development during adolescence could determine all future behavioral and cognitive processes. This effect is a result of the massive "blooming and pruning" stages the adolescent brain experiences. Numerous studies are emerging about the lack of empathy many people today seem to display. Dr. Small, in an article for CNN, cited several studies, as far back as 2002, showing that not only is empathy something children learn, but also that it is difficult for them to discern an emotion without the barrage of media images that distort or exploit suffering. I have noticed in my own classrooms that children's reactions to someone falling down or getting hurt is often laughter. Today's children learn compassion from their culture, and television shows that consist of home videos of people getting hurt (with a laugh track highlighting every image) teach us to delight in others' misfortunes, rather than to feel concern for their welfare. Additionally, cartoons or video games that trade on people getting hurt for humor teach children that injuries are funny. We are a nation becoming conditioned by schadenfreude.

We must take care to foster empathy and concern for others, exactly as Montessori does in the practice of grace and courtesy.

Montessori pedagogy is the perfect antidote to the frenetic lifestyle of so many technophiles. Montessori specifically addresses the importance of sustaining concentration, focusing on one task to completion, and cultivating skills in grace, courtesy, and empathy. Additionally, these skills are suited to the home as well as the classroom.

Dr. Steven Hughes, a pediatric neuropsychologist who specializes in brain development (he is also the parent of a Montessori child as well as an AMS 2013 Annual Conference keynote speaker), believes wholeheartedly that Montessori education is in line with what neuroscientists understand about the optimal development of the brain. In his presentation, "Good at Doing Things: Montessori Education and Higher Order Cognitive Function," Dr. Hughes provides myriad examples of how Montessori education promotes optimal brain development of children and ParentFurther ([www.parentfurther.com](http://www.parentfurther.com)) offers printable guidelines for parents and educators on how to best moderate child/teen media interface interactions. ParentFurther and Common Sense Media ([www.common Sense Media.org](http://www.common Sense Media.org)) address the possible benefits of using technology in healthy ways as well as the negative consequences of unfettered access to media (including television, video games, and Internet usage).

On its video game fact sheet, ParentFurther suggests limiting the amount of time spent and the elimination of violent "first-person shooter" games that employ violence or the objectification of women to "win." The organization also suggests limiting television, keeping media (Internet and TV) out of the bedroom, turning the TV off during meals, and maintaining ongoing dialogue on TV show choices. ParentFurther, in addition to

providing dozens of research articles, offers strong research that suggests that more than any other factor, having family mealtimes with discussions is the number-one way to boost academic achievement, even when all other variables (socioeconomic class, race, etc.) are taken into account.

Common Sense Media sends weekly email reminders and suggestions for creating a healthy balance with media as well as ideas for utilizing media in positive ways. Parents tell me that these websites have been wonderful because they educate and provide alternatives to the technology overload many families are experiencing adolescents. "In Montessori, all meaningful learning takes place through analysis of error . . . that's how humans learn; that's how we are built." Further, multisensory engagement is important, as is interaction with the outside world. Hughes continues, "Montessori provides an environment that is unique in supporting the development of executive function . . . which allows humans to modify remote events through intentional behavior."

The capacity to utilize executive functioning skills, if not developed early in life, is hard to learn later. Without executive functioning abilities, goal-oriented behavior is very difficult.

A review of the scope of current research suggests that children and teens may be permanently and negatively affected by unregulated interaction with media. But all media usage is not detrimental. In fact, though studies by the Kaiser Family Foundation reveal that media can interfere with optimal brain development, there are ways to use media productively. Children can learn how to Skype with family, make short movies, use Photoshop, create a music CD for family members, and build computer programs. Once media is demystified, children have a more accurate understanding that what they see on television, in magazines, and online is not reality—the message being that "Images may be manipulated, but you don't have to be."

Parents, though, are ultimately responsible for their children's media consumption. According to the Kaiser results, 46% of children report that their parents restrict or regulate what they watch on television, 30% have video game guidelines, and 52% percent say their parents have guidelines for computer use. These statistics reveal that about half of children have unregulated access to media—that half of our children may be socially, morally, and academically affected, perhaps permanently, by images that decrease empathy, shorten concentration, stymie creativity, and foster isolation instead of conversation. Since Montessori education was built on the backs of parents and families in America, it makes sense that as we become more educated, we educate the parents we serve. Montessorians have always understood the power of information; we take parent education seriously. Dr. Maya Angelou offered us powerful advice when she spoke at the AMS 2007 Annual Conference on the courage to do the right thing; she has been quoted as saying, "Do the best you can until you know better. Then, when you know better, do better."

[www.sandraguzman.com/2011/10/when-you-know-better-you-do-better-maya.html](http://www.sandraguzman.com/2011/10/when-you-know-better-you-do-better-maya.html)

Without question, the digital interface is a permanent aspect of our existence. Like most things in life, we must employ media to our advantage by using it appropriately and in moderation. By bringing an understanding of media's impact on social functioning and brain development to teachers and families, we may be able to help children grow into adults who experience life in its entirety and are not merely plugged into a shallow, virtual world.

## **Suggestions For Parents and the Home:**

**Spend time with people, doing things.** We bond with others through shared key experiences. Spending time together doing things that promote your family values will build strong bonds and teach children how to navigate difficult situations with empathy and compassion. Be aware of and understand the importance of your body language, facial expressions, eye and physical contact, and your general appearance. Translate nonverbal cues. For example, if your neighbor keeps looking at his watch, he may just be checking the time, or he may be giving you a nonverbal cue that he needs to leave and you should conclude the conversation.

**Live a well-rounded healthy lifestyle.** Children have to learn how to entertain themselves. They need adults who practice what they preach. If you tell children to go out and play (because it's good for their brains and bodies), and then you plop down on the couch with the remote, your actions show that you don't truly believe going outside is important. Show them how it's fun. Go outside with them, and show them how to make a fort from sticks, build fairy houses, or make clouds disappear (pick one and stare at it for as long as you can). Or garden with them; gardening is great for all the senses.

**Eat dinner with loved ones.** Studies show that children of families that prepare and eat dinners together achieve more academically.

**Have tech-free spaces in the home.** Leave cell phones in a basket by the door. Remove televisions and computers from bedrooms. If you must have a TV or a computer, have one that the entire family shares in a central family space. You will quickly become aware of how much time individuals spend, as Sherry Turkle says, "alone together."

**Demystify media and use it as an authentic learning tool.** Use a video camera to make movies of your favorite family memories. Learn how filmmakers edit movies and Photoshop images. "Remake" movies or video games that reinforce stereotypes. Mute movies and commercials, then analyze how brands are marketed, and to whom they are meant to appeal. Learn how to build or fix computers and computer programs. These activities require repetition, concentration, order, critical thinking, and follow-through, all of which are integral objectives of a Montessori education.

**No media, ever, for children under 2.** Even though the American Academy of Pediatrics made its first recommendation in 1999 to limit TV time, they updated and rereleased their recommendation in October 2011 to include new forms of media. Babies and toddlers should not have interaction with media (even so-called "educational" media) before 2 years old, and it should be limited to less than 2 hours daily for children over 2. This can be difficult, especially when media really does hold a child's attention so you can "get things done"; however, as Montessorians know, the first years are critical in brain and social development, and there is absolutely no substitute for interaction with loving human parents and caregivers. For more information, visit: <http://aapnews.aappublications.org/content/32/11/34.5.full>.

*The complete article may be read online at:*

<http://richmont.org/sites/all/sites/default/files/files/Creating%20Balance%20in%20the%20New%20Age%20of%20Technology%20%20American%20Montessori%20Society.pdf>