Why Limit Screen Time?

Research Supports Screen Time Limitations for Young Children

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ABSTRACT

Our digital environment is a vast and changing frontier that requires our innovative, analytical, and moral participation. Public Waldorf charter schools agree with child developmental psychologists, such as Howard Gardner and Jane Healy, who state that the students of today need to develop critical, ethical and creative thinking skills along with social cognition to become democratic and active participants in the transforming virtual world of technology (Gardner, 2011; Healy, 1998). Children develop these skills over time as the different areas of the brain mature and must develop them through real relationships with others. Waiting to teach technological literacy until Grade 6 and limiting screen time are essential for the gradual unfolding of cognitive and social emotional capacities that allow them to become responsible citizens in the "faceless" world of technology (Graber, 2013; Anderson, 2013).

Why Limit Computer Use Before Middle School?

A key tenet of public charter schools inspired by Waldorf education is to provide their Kindergarten-8th grade students the time and experiences they need to develop their intellectual abilities through a relationship-based education infused with hands-on learning, creative play, visual arts, dramatic arts, music, movement, and exploration in nature. Limiting the students' screen time on computers, tablets, smartphones, and television, is the expectation both at school and at home throughout these important years of their development, with a gradual introduction to technological education and the use of technological devices from grade 6 upwards.

Public charter schools inspired by Waldorf education agree with the Alliance for Childhood, which states, "technology literacy is the mature capacity to participate creatively, critically, and responsibly in making technological choices that serve

democracy, ecological sustainability, and a just society" (Cordes, 2004). "Computers are not [the] magic bullet to improve children's academic success" (Hofferth, 2010).

What is needed for academic success? We agree with a number of education experts who state that the capacity to think ethically and to develop one's "non-cognitive" skills, such as self-regulation, perseverance, "growth mindset," long-term goal-setting, social belonging, and cooperation are the skills needed for success academically (Dweck, 2011; Cohen, 2006). These crucial skills must first be developed in the "real world".

Below are research-based reasons that support Waldorf charter public schools' view on limiting and delaying screen until developmentally appropriate:

The Brain from 0-20's Is a Work in Progress

When a child is born, most of the 100 billion neurons in her brain are not hard-wired. Instead they are pure potential "waiting to be woven into the intricate tapestry of the mind" (Begley, 1996). This weaving, or "wiring diagram," of trillions of connections is being made by what the child's brain receives from her outside world from birth well into her twenties.

During this long period of time the child's brain is highly sensitive to and influenced by external environmental circumstances, including sustained interaction with digital media (Klingberg, 1999). The report "Fool's Gold: A Critical Look at Computers in Childhood" states that brain imaging studies "indicate that experiences of every kind — emotional, social, sensory, physical, and cognitive — all shape the brain, and are shaped by the brain and by each other" (Cordes, 2000).

The Brain Develops Gradually From Sensory-Motor Maturation to Higher Thinking Capacities

Specific regions of the brain mature in a somewhat hierarchal fashion over the course of childhood through early adulthood. The longer it takes for a region of the brain to mature, the longer it stays impressionable and the less able the child is to access that region.

The parts of the brain associated with more basic functions develop early, with the motor and sensory brain areas maturing first. Then the areas involved in spatial orientation, speech and language development, and attention (upper and lower parietal lobes) develop. The structures of the emotional limbic system, having to do with motivation and memory, don't complete most of their "wiring" until puberty. The frontal lobes, involved in high-level cognitive skills, such as judgment, attention, and

motor coordination, mature after puberty.

Even though most children start thinking logically by 12 years of age, and thus show the beginnings of ethical thinking, new brain science has found that certain parts of the brain are still not fully functional until about age 25. The prefrontal cortex, the part of the brain largely responsible for emotional regulation and executive functions, such as impulse control and judgment, is the last part of the brain to mature (Gogtay, 2004). All of these skills have been found to be important capacities when using technology, thus waiting to introduce technology until a child is at least able to think logically, at about 12 years of age, is very important.

"Windows of Opportunity"

As the brain slowly develops there are certain time-sensitive periods of growth or "windows of opportunities" for learning. During these important "windows of opportunity" the brain's plasticity or adaptability allows for greater amounts of information to be processed and absorbed (Wolfe, 1998). These critical growth spurts are found to occur at the earliest onset ages of the stages of reasoning development as identified by renowned child development theorist Jean Piaget, i.e., 3-10 months, 2-4 years, 6-8 years, 10-12 years, and 14-16 years (Epstein, 1980, 1986; Hudspeth and Pribram, 1990). Research shows that if a child does not receive the appropriate experiences at these times, unused neurons will be pruned at the end of that cycle. In some instances the "window of opportunity" will be closed forever.

During these sensitive stages of development, especially in the early years, the child learns best through play and direct sensory experiences (Graber, 2013).
Time spent with media detracts from time spent with real life experiences, and researchers are beginning to see the effect this has on child's brains. For example, while a large body of uncontested research finds that face-to-face contact, creative play, hands-on activities, and physical movement are the building blocks of healthy brain development, preschoolers (ages 2-4 years) are spending about four hours per day with media (Chiong, C. & Shuler, C., 2010). Studies show that the use of technology at this stage can interfere with healthy cognitive development.

Another important period of brain development occurs between the ages of 10 and 12 years, as mentioned in the section above, when children are constructing meaningful cognitive functions. In a recent study conducted by researchers at UCLA, sixth-graders (in this 10-12 age range) who went five days without even glancing at a smartphone, television or other digital screen did substantially better at reading human emotions than sixth-graders from the same school who continued to spend hours each day looking at their electronic devices. Other studies have found that when children spend prolonged lengths of time staring into screens their physical and mental health may suffer. For instance, increased TV viewing over time has been linked to a higher risk of

depression and anxiety among teen girls. (Uhls, 2014).

Graber (2013) cites “in keeping with the developmental findings of both Piaget and Kohlberg, who believed that up until about 12 years of age children [are] still developing the cognitive capacities required for ethical thinking, it appears that middle school is the right time” for introducing technological participation. Interest in media peaks in the middle school years (grades 6-8) and children need to learn how to use it respectfully, safely, and positively. They also need to be taught skills that will help them balance technology use with other aspects of their lives.

Self-Regulation, Self-Control and Multitasking

Long-term academic success is linked to the ability to set aside short-term activities that may be more appealing (playing video games, texting, etc.) to engage in the needed responsibilities to achieve that success, such as paying attention in class, studying, and completing homework (Duckworth, 2005). Researchers such as Carol Dweck of Stanford University are proposing that “in an age in which children encounter more and more distractions—such as Facebook, Twitter, and text messages—the ability to turn off distractions to focus on a difficult academic task may become increasingly important for success in school and in life” (Dweck, 2014).

The word *multitasking* is used freely today to describe the task-juggling that we all engage in due to the multiple, simultaneous demands on our time and attention. But cognitive, behavioral and neurological scientists seem to be moving towards a consensus that such a state does not actually exist in the human brain. Most media multitasking is actually not multitasking or parallel processing at all, but rather rapid task switching, and studies show that this switch tasking is mentally damaging.

Stanford University professors Clifford Nass and Eyal Ophir, who study “multitasking,” have found most media mulitaskers are worse at task switching than they think. According to their research, high media multitaskers (HMM’s) have greater difficulty filtering out irrelevant stimuli from their environment; they are less likely to ignore irrelevant representations in memory, and are less effective in suppressing the urge to engage in irrelevant tasks (Nass, et al., 2009).

This is an important point, especially when we consider that 8-18 year olds spend an average of 10 ½ hours per day engaged with media when researchers account for multitasking, or task-switching (Rideout, et al, 2010). Likely they are switching their precious attention from homework to text messages or social media.

Importance of Social Cognition

The skills needed to be aware of our own mental states and those of other people, known as "social cognition,"develop slowly, from the first day of life up to late adolescence (Choudhury, 2006). These skills allow one to understand cultural norms and appropriately interact with others. They have a direct impact on the quality of one's relationships and success in life. Children and teens need plenty of face-to-face experiences to learn how to read others' emotions through gauging voice, facial expressions, gestures, and posture.

According to Michael Friedlander, head of neuroscience at Baylor College of Medicine and a member of the Dana Alliance for Brain Initiatives, "kids who are spending all of their time interacting through [the] cyber world are very likely to not have the opportunity to develop [these] skills that are innate and important to the human brain" (Patoine, 2008). Specifically, research is beginning to show that young people appear to possess less ability to demonstrate empathy and to focus for extended periods of time on one task or on a linear thought. Sherry Turkle, professor of sociology at M.I.T., "raises the possibility that extensive interaction with cyberspace (especially through multi-user domains) may create individuals incapable of dealing with the messiness of reality, the needs of community building, and the demands of personal commitments (National Science Board, 1998). "

The Effects of Screen Time

In 2013, the American Academy of Pediatrics created new guidelines for children's technology use to balance screen time with other critical aspects of learning, adding that more research on the impact of media on children is necessary. These recommendations were born from several long-term research studies revealing that an excess of "screen time" has a number of negative effects on youth, including childhood obesity, irregular sleep patterns, and social and behavioral problems. With more than two hours of screen time per day, children are also more likely to experience a drop in school performance and increased aggression. Recent studies following thousands of European preschool and school-age children linked upward-creeping screen time to emotional and family problems and to a lack of sleep.

Healthy Media Diet

AAP spokeswoman Marjorie Hogan advises families to cultivate a "healthy media diet" with all things in moderation. The AAP's specific guidelines are:

0-2 Years

In 1999 the American Academy of Pediatrics first provided guidance on media use for children under age 2. At the time, there was limited data on the subject, but the AAP

believed there were more potential negative effects than positive effects of media exposure for the younger set, so they recommended no screen time at all for children under 2. Newer data bears this out, and the AAP stands by its recommendation to keep children under age 2 as "screen-free" as possible."

2-18 Years

In 2013 the AAP raised eyebrows by issuing a policy statement regarding media use for children ages 2-18, recommending that parents:

- Limit entertainment screen time to ***less than one or two hours per day***.
- Model effective "media diets" to help their children learn to be selective and healthy in what they consume.
- Take an active role in children's media education by co-viewing programs with them and discussing values.
- Make a media use plan, including mealtime and bedtime curfews for media devices. Screens should be kept out of kids' bedrooms.

See the AAP recommendations at:
http://pediatrics.aappublications.org/content/132/5/958.full.pdf+html

SUMMARY

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