

Dr. Larry Rosen

How Much Technology Should You Let Your Child Use?

I recently read two articles that struck me in the way they examined the impact of technology on small children. In a *New York Times* article entitled, “The Child, the Tablet and the Developing Mind” Nick Bilton described watching his sister calm her four-year-old and seven-year-old children at a restaurant by providing each an iPad to use during dinner. Then, a week later, I stumbled across an article in the *Daily Mail* where Rebecca Seales and Eleanor Harding described a four-year-old girl who is being treated for iPad addiction. These two articles reminded me that a brand new invention, called the “iPotty,” was unveiled at the 2013 Consumer Electronics Show which incorporates an iPad holder in a portable potty trainer to keep the child occupied while learning to go to the bathroom on his/her own and I felt as though I had hit the trifecta¹ of today’s parental conundrum. Where do you draw the boundary between allowing your children to avail themselves of highly engaging technologies and excessive use or overuse of those very same highly engaging technologies?

I am privileged to speak to groups of students, parents and educators around the world mostly due to having researched and written books about the impact of technology for more than a quarter century. I actually started studying what has been termed the “psychology of technology” way back in 1984 when Apple introduced the Macintosh in a stunning Superbowl advertisement that promised us that, “1984 won’t be like 1984²” and tomorrow’s computers would herald a change from the humdrum world of IBM computers to the highly engrossing world of the Mac. And, indeed, it did change the world. And what followed were even more and better tools that moved us from a mouse and keyboard to a touch screen on a device that we can carry with us 24/7/365.



I talk to parents about how technology is such an interesting double-edged sword. On the one hand there are more apps than one could ever want to teach your children math, science, reading and a host of other skills. My granddaughter, who just turned a year old, loves math apps and Paint Sparkles as well as trying to follow the swimming fish on the iPad screen. I have watched even younger children grab an iPhone or iPad and touch and swipe and find their favorite games or videos in seconds and then sit absorbed for long periods of time.

The critical questions are: Is this bad for our children? Is it wrong to provide them the most up-to-date tools for both entertainment and teaching? Is it wrong to want to see our children smile and grin as they watch their favorite videos? The little girl in the UK who was being treated for iPad addiction is one example of what can happen if a child is left to play with these toys for hours on end. On the one hand it is comforting (and useful) to have your child so easily entertained. After all, isn’t that what we used to do with the television? When mom or dad needed some time to make dinner or do a bit of work they knew that they

¹ *hit the trifecta*: (here) found the three most important examples

² a novel by George Orwell (1903-1950)

could sit their child in front of a Disney video and they would have a respite while their little couch potato sat absorbed.

40 The new touch screen gadgets offer a different experience and one that I tell parents demands more structure. Television is a passive medium and, as such, requires less use of certain brain areas than active media such as iPads, iPhones and computers. Compared to gazing slack eyed at the TV screen, making decisions about what to touch and where to swipe activate different areas of the prefrontal cortex, not to mention what it does in the amygdala in producing emotional reactions to these decisions. And we see what happens if you don't limit this active participation. The child continues to be reinforced in the highly
45 engaging e-world and more mundane worlds, such as playing with toys or watching TV, pale in comparison.

When I talk to parents I discuss three main issues that can arise from allowing their children to overuse technology:

- Lack of time for essential personal interactions in the real world
 - Lack of time for creative thought and mind wandering
 - Lack of time for calming overactive brains
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Although e-communication is not that prevalent among young children, the overuse of technology keeps them from spending time playing with their parents, siblings or peers. As these young children grow up and embrace electronic communication, as do their older preteen and teenage siblings (a typical teen would rather connect with their friends through texting and social media than face-to-face), they are sending and receiving messages behind glass screens. And behind a screen you do not see anyone but yourself reflected
55 back. You don't have a sense of the "context" that the recipient finds himself in nor do you have an understanding of how your message impacts that person. And adding in the occasional LOL or smiley face is not sufficient. Without this contextual information from those receiving your messages, you will have a very difficult time learning the pragmatics of communication including an understanding of the impact that your words have on the other person as well as the niceties of back-and-forth communication. Learning
60 these skills was far easier before technology arrived and we parked ourselves and our children in front of those high-def screens.

Our brains have a specialized mechanism, called the Default Mode Network, which has been appraised as being operational during daydreaming, mind wandering and other non-task-oriented behaviors. If you are constantly and actively making decisions about what to do on an iPad, you will not activate the DMN which
65 neuroscientists are now understanding keeps your mind focused and does not allow for the types of "ah ha" experiences gleaned during mind wandering.

Finally, neuroscientists have begun to show evidence that interactions with technology over-stimulate your brain. Dr. Gary Small at UCLA demonstrated this with brain scans of older adults who had never used the Internet showing more activity when using Google than when reading a book. Other studies have validated
70 that the constant task switching afforded by multi-screen technologies activates more of your brain than simply working on a single task to completion.

What is the solution? I tell parents that children need to use technology at a ratio of 1 to 5 meaning that for every minute of tech use there should be an equivalent 5 minutes of time spent doing something else
75 including talking to people, interacting with toys that promote creativity (and mind wandering) and doing activities that calm an overactive brain. So, if your child uses an iPad for 30 minutes (my recommendation of the maximum time for a child up to around four or five years old) then he or she should do some other activities for 150 minutes to balance out their brains and to allow for practice communicating and mind wandering. As the child gets older, the ratio starts to change and around the time your child is a preteen

80 the ratio is usually about half and half. When technology becomes more prevalent in the teen school and social life that ratio flips to 5 to 1 with teens still needing time away from technology but also needing to connect with their schoolwork and their virtual social worlds.

One further piece of the puzzle concerns the amount of time spent using technology before taking breaks. Dr. Nathaniel Kleitman was well known for his work on sleeping behavior, teaching us that our sleep comes
85 in roughly 90-minute cycles, each culminating in a dream state. Kleitman also talked about a BRAC – Basic Rest and Activity Cycle – that we maintain during the day that is also around 90 minutes. After about 90 minutes of technology interaction we all need a short rest – I advocate about 10 minutes – and neuroscience can tell us what we can do to calm our brains and make them more available for completing our work in an expeditious manner. For example, a recent study by Dr. Richard Coyne and his colleagues
90 showed that if you walk in nature your brain activity calms to a state of involuntary attention, which is much less activating and energizing. Other research has shown that looking at art, listening to or playing music, practicing a foreign language, exercising, meditating, taking a warm bath or shower, or even having a pleasant conversation with a friend face-to-face or on the phone calms your brain. And for an added bonus, many of these activities have also been shown to enable your Default Mode Network. Many people
95 report that they get their most creative ideas when wandering in nature or taking a hot shower or bath. Neuroscientists agree.

The bottom line is that we need to start taking care of our children’s brains – and our own – as early as possible. Start when they are little with technology in moderation and opportunities for mind wandering, creative activities and your child will grow up with solid communication and thinking skills.

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