

# *Unseen and unexamined changes: The internet's silent restructuring of our brain pathways and interpersonal relationships*

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## The call

Principal Fiona, while attempting to build excitement about creative use of technology in the classroom, discovers that almost every teacher at the staff meeting is engrossed with her tablet or smartphone instead. When Fiona requests that devices be turned off during the discussion, the anxiety level in the room escalates palpably. Unperturbed, math teacher, Leon, cleverly tucks his iPhone out of Fiona's sight, to continue reading sports scores as they pop onto his screen.

When technology calls, we answer. Upon waking each morning, thirty-six percent of adults check our emails, texts and social media messages before doing anything else (Consumer Digital Study, 2013). We answer the call regardless of myriad studies that show anxiety, difficulty paying attention, depression and Internet Addiction Disorder (IAD) can result.

While internet usage connects us to one another and universes of information, it also silently reshapes how we think and learn. Are we, as education leaders, critically analyzing how our interface with the internet changes human learning and interaction? Can we envision how future generations of learners will interact, as a result, with human beings as teachers and fellow learners?

Early childhood expert, Diane Levin, notes: "Children who have two or more hours of screen time a day tend to exhibit more psychological difficulties, such as 1) hyperactivity, 2) emotional and behavior problems, and 3) difficulties with peers (2013, 17). Laptop usage in class by university students "interfered with students' abilities to pay attention and to understand the lecture material, which resulted in lower test scores" (Fried, Computers and Education, 2008, 911). In "Why successful people never bring smartphones into meetings" (2013), Kevin Kruse, cites research revealing:

- Eighty-four percent of "older professionals" think texting or emailing during formal meetings is inappropriate; whereas,
- Millennials are three times more likely than those over 40 to think checking text messages and emails during informal meetings was OK.

Are we as education leaders as aware as we need to be about the silent changes the internet is making to our brains, and consequently to our relationships?

Consider this vignette: "Why don't you just call Janie?" urges the perplexed mother whose daughter, Pippa, has been

Although the use of any kind of tool can influence our thoughts and perspective—the plow changed the outlook of the farmer, the microscope opened new worlds of mental exploration for the scientist—it is our intellectual technologies that have the greatest and most lasting power on how we think. They are our most intimate tools, the ones we use for self-expression, for shaping personal and public identity, and for cultivating relationships with others.

-Nicholas Carr (2010, 45).

slumped over her iPhone texting her BFF, Janie, all afternoon. When Pippa finally realizes her mother was asking her a question, she looks up, and says: "I wouldn't know what to say to her."

## Progress is our most important product

While an actor, Ronald Reagan marketed General Electric on television by proclaiming: "Progress is our most important product". Is progress our most important product?

Our actions as school leaders seem to support that standard. We welcome technology into our blended and flipped classrooms. We urge teachers to transition from being "sage on the stage" to "guide on the side". We are heartened by the progress autistic students make using computer programs tailored just for them. We can join online professional development groups with colleagues worldwide. Who would want to go backward? Technology only moves forward.

## Gains and losses that accompany change

Consider:

- How has your life been improved by the internet?
- Is the internet changing the way you relate to yourself and others?
- What effect is net usage having on the primacy of the teacher-student bond?

Remember what your life was like before text messages, emails, Facebook, Instant Messaging and twitter? I recall:

- The neighborhood gossip trying to stifle a sneeze as she eavesdropped on party lines conversations,
- Pulling off the road to place a call from a telephone booth,
- Opening holiday cards with personal hand written messages,
- Unfolding dog-eared maps to figure out my route,

I am grateful for internet connectivity: Isolated grandparents can hear all about a child's first day of school thanks to Skype. When tragedies like tsunamis or typhoons strike, we can thank the internet for instant updates and links on how to help.

If technology transforms our lives for the better, why focus on side effects like cell phone addiction or decrease of face-to-face or even heart-to-heart conversation? Telling stories around a crackling camp fire will always have allure. And that relationship between teacher and student will always be at the heart of learning. True?

The internet is what my mother used to call a "mixed blessing". Every change brings a loss as well as a gain.

## What the internet doesn't tell you

Faster. Better. Smarter. These are the gifts of technology. The world, thanks to the net, is at our fingertips. We have gained a world; but, what have we lost?

As we acknowledge how technology has freed us from figuring things out for ourselves, do we notice we lose capacities we no longer use? If your GPS malfunctions in fast-moving traffic in a new city, which turn do you take?

As Fiona's daughter texts her friend non-stop, her conversational skills atrophy and her prowess at staccato communication grows. LOL.

## The silently seductive restructuring of our brain's pathways

The pathways in my brain and yours are changed by our interaction with the internet. What we do not use, we lose. The losses can be permanent.

Our brains, like muscles, develop with use and atrophy with disuse. In fact, "Experiments show that just as the brain can build new or stronger circuits through physical and mental practice, those circuits can weaken or dissolve with neglect." (Carr, 35)

The internet fires up our short term memory, that capacity to take in information in the moment. The net is less likely to activate long term memory, that stored bank of meaningful information and concepts. Our short term memory can take in finite amounts of information. Little if any of that information and those concepts gets poured into our long term memory. In time, we become less reflective and increasingly hungry for new information (Carr, 120-124).

That continuously "alert" part of our brain is disengaged from our executive function, the pre-frontal cortex where our capacity to reason, reflect, and make informed, even wise decisions, resides. The autonomic system, based in the amygdala gland, keeps us adrenalized, scanning the environment for novelty (Cozolino, 2006).

The more distractions the internet provides, the less likely we are to remember much of anything. Have you berated yourself for forgetting a name or where you parked your car?

We have morphed into multi-taskers, able to text, talk and drive at the same time. Drive, you say? Seventy-seven percent of young adults believe they can text and drive, despite laws against this dangerous behavior (textinganddrivingsafety.com). Principal Fiona's teachers believe they can surf the net and share at staff meeting.

A growing body of research contends the net is addictive (Rosen, 2010). We wake up and do not act until we access our messages online. As teacher Leon hides his cell phone from Principal Fiona, Leon's internet dependency trumps human interaction.

We think we are expert multi-taskers. Studies show multi-taskers are less able to accomplish anything well. As we are continuously distracted, we fail to give full attention to anything. The net "seizes our attention only to scatter it" (Carr, 118).

If you were to click on the net now, how many choices face you? If you decide to research flipped classrooms, you will find pages of links. One link leads to another while an email alert system announces "you've got mail." Icons might lure you to check your twitter or Facebook messages. Bright red advertisements blink like neon to demand your attention. Like a fireworks display, our brain cells are popping all over the place. What our brains are not doing is diving deep.

Reading a novel, by contrast, calls upon long term memory, the part of the brain where we make sense of data. Reading novels

As we come to rely upon computers to mediate our understanding of the world, it is our own intelligence that flattens into artificial intelligence. (Carr, 224)

Whenever we turn on a computer, we are plugged into an "ecosystem of interruption technologies". Cory Doctorow as quoted by Nicholas Carr, 2012,

exercises brain pathways "in areas of the brain associated with language receptivity and representative understanding" (Rebora, 2013). The lament of many professors is: "My students won't read books anymore". Why bother when someone else has summarized the main points into bullets?

Our instinctive response to internet interruptions is to follow the interruption. In that moment, our "train of thought" scatters. After hours of use, our thinking becomes anything but deep.

## The net effect on relationships

Thanks to the study of emotional intelligence or EQ, the ability to read people as well as we read books, and to neuro-scientific research on the power of face-to-face relationships, we know:

- Each heartbeat communicates a negative or positive feeling to the people within five feet of you (McCraty, 2004)
- Our mirror neurons both soak up feelings of the people around us.
- Mirror neurons amplify the emotional messages of people perceived to be in power (Goleman, 2006).

Many studies have shown:

- A child's positive relationship with one adult at school from the janitor to the principal has a significant effect on whether that child stays in school.
- Children who cannot form relationships are the most likely to drop out of school.

Communication in face-to-face relationships is rich, nuanced and memorable. Learning to read these languages of the heart can take a lifetime.

Teaching and learning is all about relationships. A teacher with EQ knows how to engage and inspire each student in her classroom. My autistic son thrived in classrooms where he and the teacher connected. Nick raised havoc in classrooms where the teacher was more committed to the subject matter than to her students.

Who is the teacher who changed your life? Chances are strong that that teacher noticed you as special, paid attention to your needs, and above all, cared about you. When a child feels safe and appreciated, she is freer to learn.

As students, and teachers, read the net instead of reading each other, what becomes of those touching and compelling relationships? Steve Jobs and other technological geniuses have taken us to unimaginable worlds of data. But did these innovators take into account a child's need for a teacher's warm physical presence?

A computer cannot hug a child, as of yet. Nor can a computer sense the sorrow of a bullied child, as of yet. A computer cannot listen empathetically to an unemployed parent, as of yet. And no computer has mastered the non-verbal and verbal art of holding a meaningful, elucidating conversation, as of yet.

If human connection is the heart of our profession, will our dependence on the internet screen atrophy our ability to be present to one another physically in the moment?

Maybe, sooner than we can think about it, our need for more data faster will atrophy our need for one another. If that is the case, what does the future hold for school children, teachers, principals, the learning process, and above all, our heart-to-heart physical connection to one another?

More than 40 years ago, one of my students at Carver Junior High School in Mississippi asked me: "Why should I care about your math if you don't care about me?"  
-Carol Lach, 2013

## Bibliography

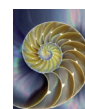
- Axiom Digital Impact, 2013. "Consumer Digital Study". [www.emailmonday.com/mobile-email-usage-statistics](http://www.emailmonday.com/mobile-email-usage-statistics)
- Bruno, H.E. 2012. *What you need to lead: Emotional intelligence in practice*. NAEYC.
- Carr, N. 2010. *The shallows: What the internet is doing to our brain*. New York: W.W. Norton & Company.
- Cozolino, L. 2006. *The neuroscience of human relationships: Attachment and the developing social brain*. New York: Norton.
- Fried, C. B. 2008. "In-class laptop use and its effect on student learning". *Computers & Education* 50, [www.elsevier.com/locate/compedu](http://www.elsevier.com/locate/compedu)
- Gilkey, R, R. Caceda, & C. Kilts. 2010. *When emotional reasoning trumps IQ*. *Harvard Business Review* 88: 27.
- Goleman, D. 2006. *Social intelligence: The new science of human relationships*. New York: Bantam Dell.
- Goleman, D. 2010. *Emotional intelligence: Why it can matter more than IQ*. New York: Bantam.
- Kruse, K. "Why successful people never bring smartphones to meetings". [www.talentsmart.com/articles/Why-Successful-People-Never-Bring-Smartphones-to-work](http://www.talentsmart.com/articles/Why-Successful-People-Never-Bring-Smartphones-to-work).
- Levin, D. 2013. *Beyond remote controlled childhood*. NAEYC.
- Mayer, J.D., & P. Salovey. 2004. What is emotional intelligence? In *Emotional intelligence: Key readings on the Mayer and Salovey model*, eds. P. Salovey, M.A. Brackett, & J.D. Mayer, 29–60. Port Chester, NY: National Professional Resources.
- McCraty, R., M. Atkinson, & R.T. Bradley. 2004. Electrophysiological evidence of intuition: Part 2. A system-wide process? *The Journal of Alternative and Complementary Medicine* 10 (2): 325–36.
- Rebora, A. "Novel reading could be good for your brain". *Education Week Teacher* blog, January 13, 2014, [blogs.edweek.org/teachers/teaching\\_now/2014/01/study\\_novel\\_reading\\_generates\\_sustained\\_boost\\_in\\_student\\_brain\\_activity.html](http://blogs.edweek.org/teachers/teaching_now/2014/01/study_novel_reading_generates_sustained_boost_in_student_brain_activity.html)
- Rosen, L. 2012. *iDisorder: Understanding our obsession with technology and overcoming its hold on us*. New York: Palgrave MacMillan.

## Podcasts and websites

- "Creating sensible policies on cell phones in the classroom", [BAMradionetwork.com](http://BAMradionetwork.com) (Interview with Dr. Larry Rosen by author)
- "Three keys to working with people who push your buttons", [BAMradionetwork.com](http://BAMradionetwork.com) (Interview with Dr. Louis Cozolino by author).
- [Consumerdigitalstudy.com](http://Consumerdigitalstudy.com)
- [Textinganddrivingsafety.com/textinganddrivingstatistics.com](http://Textinganddrivingsafety.com/textinganddrivingstatistics.com)



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**Holly Elissa Bruno**, MA, JD, is an author, international keynote speaker, attorney and radio host.

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You can also listen to Holly Elissa being interviewed on NAEYC Radio, National Head Start Association Radio, and National Association of School Principals Radio.

Holly Elissa's keynotes receive stellar audience reviews from Reykjavik to Phoenix, Tulsa to Tampa and Vancouver, British Columbia to Washington, DC. To "recovering attorney" Holly Elissa, life is too short to anything but enjoy it daily.