

Understanding The New Digital Landscape, Kids & the New "Digital Divide"

© The InfoSavvy Group, 2007

This article has been prepared by Ian Jukes for MABE 2007. Ian Jukes is the principle of the InfoSavvy Group, an international consulting group that provides leadership and program design in the areas of assessment and evaluation, strategic alignment, curriculum design, professional development and planning. His offices are located in Illinois.

The Good Old Days

Any educator worth their salt knows that today's kids are fundamentally different from us when we were kids. It is hard to comprehend the vast differences or their significance because many of us grew up in times that were relatively simple, predictable, slow-paced, and decidedly low-tech. We heard about world events, often long after they happened. Information was finite and mostly paper-based text. Research customarily involved a library trip. Whether it was information, communications, services, or products, we learned to wait, be patient, and understand deferred gratification (Jukes and Dosaj 2004). Schools reflected these times: safe, orderly, valuing punctuality, neatness, and our unquestioning acceptance of their authority.

Fast Forward to Today's World

The concept of family has shifted from Father Knows Best to the Family Guy, from Beaver Cleaver to Beavis and Butthead. In the 1950s, only 20% of families had both parents working in a 5-day per week economy. Today, 50% of families have both parents working in a 24/7/365 economy. Over 50% of children come from single-parent homes. In 68% of American homes, the only parent or both parents work just to survive (US Census Abstracts, 2003). In one week, in the life of an average school-age child, he/she spends 0.5 hours with dad, 2.5 hours with Mom, about 2.2 hours on homework, 0.5 hours reading for pleasure, but over 25 hours watching TV (National Institute on Media and the Family 2004a, 2004b)!

Technology's Role

Work pressures cause parents to spend 40% less time with their children than they did 30 years ago (Putnam 2001). The scarcest resource for many families is paying attention to their children. Consequently, there is a growing void in children's lives, which has been filled increasingly by technology. It began years ago with the telephone, radio, and TV; then came videos and video games; now we can

add e-mail, surfing, online chatting, gaming, blogging, and texting to the list. Some 64% of youngsters come home from school to no one, because their parents are at work. For many reasons, including safety, many children remain inside rather than play outside, interacting with these technologies (Center for Social Media 2001).

The Digital Landscape

Increasingly, youngsters find their role models and learn social skills through these technologies, which fill their rooms with people, relationships, and interactions. Consequently, this generation is equally comfortable with virtual, screen-to-screen relationships as they are with face-to-face ones. Media Family tells us that 62% of school-age children now have TVs in their bedrooms. An estimated 82% of American children and teens play video games regularly, spending over 35 hours per week in front of some type of screen. Over 70% of dollars spent by children and teens on toys are for electronic games (Center for Social Media 200; Lenhart 2004a, 2004b, 2004c).

Time and distance, which meant so much to us, means little to today's youngsters because they are accustomed to seeing world events as they happen. Instantaneous access to information, goods, and services 24/7 has virtually led to the death of distance (Cairncross 1997) and patience, and the emergence of a generation expecting, wanting, and demanding instant gratification. This is one of the reasons why it is harder to encourage kids to read books today. Reading is a delayed gratification medium while TV, video games, and the Web provide gratification immediately.

MTV Mindsets

Not only do the digital devices facilitate instant connections with friends, games, music, movies, shopping, cheat sheets, and over 10,000 online clubs, today's youngsters have grown up with text, images, sounds, and video in a single digital medium of 1s and 0s (Center for Social Media 2001). This has led to a MTV mindset, which means that they are comfortable with the simultaneous bombardment of images, text, and sounds, that incidentally, provide relevant and compelling experiences conveying more information in a few seconds than can be communicated by reading an entire book. Further, these media not designed for passive viewing but interactivity. Today's generation is no longer satisfied to be the audience; they want to be the actors, craving connectivity and interactivity with everything and everyone (Jukes and Dosaj 2004).

Global pervasiveness

These trends do not only apply to those who have access to computers. These trends apply equally to the so-called technology have-nots or disadvantaged kids on the other side of the so-called digital divide; video games, cell phones, pagers, and MP3 players are affordable and voraciously sought by many youngsters, not just in North America, but across the world. The trends are pervasive globally, regardless of socio-economics, culture, race or religion. For example, last year China's estimated 220 billion cell phone messages, a significant portion of them by youngsters, represented more than the rest of the world combined (People's Daily Online 2003; Chinadaily 2004; Prison Planet 2004)!

Digital Natives

Today's kids crave tools that facilitate networking. As nimble multi-taskers, kids use hyperlinks/text and instantaneous random access seamlessly, as they do their homework, talk on the phone, listen to music, download movies, surf the Web, while maintaining multiple simultaneous conversations on a chat line. Using technology transparently, without marveling at it, or wondering about how it works, today's generation have grown up speaking digital - this is their native language - and they speak it fluently; they are digital natives (Prensky, 2001a, 2001b; Monitor Today 2004; Stepp 2004).

Digital natives process and interact with information, and communicate in fundamentally different ways than previous generations. Take Instant Messaging (IM). Over 3 to 5 billion instant messages are sent everyday in the US alone, a significant portion of them by teenagers (Monitor Today 2004; Stepp, 2004; Lenhart, 2004a, 2004b, 2004c). IM has created a rapidly evolving hybrid *write-speak* language based on words and pictures. Using just a few key strokes, complex messages are composed, sent, and instantly responded to from anywhere: bus, movie theatre, bedroom, classroom or even the exam hall! This is exemplified by the Christian Science Monitor who recently reported on a 13 year-old girl who submitted an essay (13), which began:

"My smmr hols wr CWOT. B4, we ud 2go2 NY 2C my bro, his GF & thr 3 :- kds FTF. ILNY, it's a gr8plc."

Translation: "My summer holidays were a complete waste of time. Before, we used to go to New York to see my brother, his girlfriend and their three screaming kids face-to-face. I love New York, it's a great place."

And that is the sanitized version without the icons!

The New “Digital Divide”

Today we face a widening digital divide - not one based on the gap between the technology haves and have-nots - but by one resulting from the vast differences between how we grew up and how today's generation are growing up. Coming from another land and time, we are immigrants and foreigners in this digital landscape, speaking digital as second language. Some have us are better than others at adapting to the ways of this new land, but like all immigrants, most of us retain some degree of our accent (Ruskoff, 1999; Prensky, 2001a, 2001b; Jukes & Dosaj 2004).

Being DSL

By being DSL - speaking *digital as a second language* - many of us are distracted and disoriented by the multiple, simultaneous, hyperlinked information sources inherent to the new technologies. We are far more comfortable reading a manual, taking a how-to course, watching a video or a TV show from start to finish, one channel at a time, applying our ingrained top-to-bottom, left-to-right, logical, linear, sequential mindsets, which were created are a direct consequence of our interaction with the dominant technologies when we were growing up.

Interestingly, such mindsets represent only one sub-set of a wide repertoire of digital natives' cognitive skills, and used by them in a limited fashion. Even though many of us immigrants use digital devices and the skills sets inherent to them, their use is neither intuitive nor natural. Digital natives, on the other hand, simply pick up these devices and start experimenting with them immediately, assuming that inherent design of the devices will help them to develop the skills needed to use them (Brewer and Catafalano 2003). Such skill development is facilitated by digital natives' use of rapid-fire, trial-and-error learning strategies. Unafraid of making mistakes, natives will seek help just-in-time, often online, because speed is important to them as is speedy learning (Ruskoff 1999).

The learning and communication styles of digital natives are beyond the comfort zone of many of us digital immigrants. By the time we have read the table of contents of manual for a technology device, the native has already discovered 15 things about that device that work and 15 that do not! The immigrant is afraid they will break the device, while the native simply hits the reset button and starts over. We try to apply our mindsets and skills learned in another time and place to

the new digital landscape. Digital natives, fluently use skills and literacies applicable to the digital landscape that are directly opposite and counter-intuitive to ours.

Unable to comprehend, let alone value digital natives' skills, we tend to complain about the skills they *do not* seem to have or use: they have limited attention spans; they cannot sit quietly; they are unable to focus or do seatwork; they cannot write, or too speedy. In so doing, we unconsciously assume that their skills are not as good as ours; or that they are not as literate, attentive, or as intelligent as we are because they do not seem to value or prioritize our skills. We apply our definitions of what constitutes attention span, being a good student, good listener or viewer (Ruskoff 1999, 47-53). Instead of acknowledging that the world is fundamentally different, as are the skills needed to flourish in the new digital landscape, many immigrants nostalgically yearn for the old country. This widens the digital divide, increases disengagement from school, explaining the rising number of discipline challenges experienced by today's educators, and the startling number of students dropping out of high schools.

Research

There are two major research fields that can help us understand our observations:

- a. the *brain* or neurosciences, which traditionally studied the nuts and bolts or the brain's hardware;
- b. the *mind* or psychological sciences, which examined the software or the brain's mental processes.

These fields are merging, which together with technological advances now produce exciting new fields including cognitive neuroscience, neuropsychology, and neuroinformatics. Despite recent advances in brain/mind research, we are still in the rudimentary stages of our understanding. There are some research aspects that all educators *must* know in order to grasp their significance for increasing student engagement, motivation, memory, learning, and achievement (Maxwell 2004; Bruer 1999; Bransford et al).

Conventional neuroscientific beliefs held that by age three, the brain had a fixed number of cells, which died off throughout life. Memory, intelligence, and processing power were unchangeable. All brains were the same, using the same neural circuits for our mental processes, regardless of race, culture, or experience.

Such beliefs are now known to be wrong. The brain makes cells throughout life. It changes constantly or is neuroplastic. This occurs because of experience or input, by breaking old circuits and their connections and making ones, thereby creating new thinking patterns. Younger brains are more plastic than older ones. New neural circuits become permanent depending on the focus, intensity, repetition, and duration of experiences, and operate on *use-it-or-lose-it* and *survival-of-the-fittest* principles (National Institute for Mental Health 2001; Bransford et al 1999; OECD, 2001)

This helps us understand *why* and *how* digital kids' brains can be so different from ours. Digital natives use technology for long periods, intensely, repeatedly, and with great focus. Combine this with technologies that facilitate hypertext, interactivity, networking, random access, and multitasking, and it becomes evident how their neural circuitry is established, and why they process information differently than us.

Peeking Inside Brains

Scanning/imaging techniques, including Electro-Encephalography (EEG) functional Magnetic Resonance Imaging (fMRI), Positron Emission Tomography (PET) scans, and OT (Optical Topography) facilitate viewing normal and impaired brain functions non-invasively inside living brains while they think - feeling sad, adding two plus two, or moving a finger. We believe that if we were to scan our parents' brains and compare them to ours, we would probably see that that we use *slightly* different neural pathways to process the same information than them. However, if we were to compare our brain scans to those of our kids, we would probably find that they use *fundamentally* different neural pathways to process the same information than us.

Related research findings

Recent neuroscientific findings also validate well-established research from the psychological sciences including multiplicity of human intelligences, social aspects of learning, learners' need for context and relevance, connecting new learning to older learning, role of emotion, and high- challenge/low-threat environments. Current research also exposes some widely held assumptions, myths, and dogmas about learning that can impede learning or are just plain wrong, e.g. gender stereotyping and left-and right-brain learners, enriched environments in early childhood, fixed intelligence, IQ as the measure of all intelligence, that all brains are the same, or that memory fades as we age (Jukes and Dosaj, forthcoming).

Sadly, almost none what we have learned about how the brain functions is being applied to help understand today's learners or their learning and communication preferences. Nor is it reflected in many of the assumptions that are the foundations of public education today.

Beware of Snake-Oil Salesmen Selling "Brain-Based Education"

These days there is considerable hype around recent neuroscientific findings leading to the emergence of so-called "brain-based education" models, which have become fashionable in many schools and districts throughout North America. The hype is, in part, due to neuroscience being viewed by some as far more exciting and sexier than the considerable body of well-established psychological research. "Brain-based education" is held up by some as the research-based panacea to many of the ills besetting education.

Excuse the rant for a moment, but talking about brain-based education makes just about as much sense as talking about leg-based walking or mouth-based eating! What else should education be, if not brain-based? It is important to examine the research base of these "brain-based" educational packages and training currently offered to educators. Many are built on hype, myths and misconceptions that reinforce deeply-held erroneous educational beliefs and assumptions. Others are simply psychological research-based sheep seductively dressed up in neuroscientific wolves' clothing (Bruer, 1999).

Gullible, solution-seeking educators and policy-makers desperate for immediate, measurable results buy into such products because research can be twisted around to explain, justify or conversely discredit just about anything. This is despite the fact that the hype often is based on isolated or limited research findings that may have been glamorized, misinterpreted or misrepresented by overzealous publishers and the media .

It *is* critical that educators ensure that instructional practices are based on well-researched solid theories of learning and memory (Bransford et.al 1999; Heuer 2004). You may feel overwhelmed by the research and worry that you are being sold a bill of goods. The following statement is sound advice from J. Byrnes (2001, p.185):

"By itself, brain research cannot be used to support particular instructional practices. It can, however, be used to support particular psychological theories of learning, which in turn can be used to design more effective forms of instruction."

Using current research

Current brain research sheds light on *why* and *how* youngsters' experiences in the digital landscape are impacting their brains and minds. Combining this with well-established psychological-based theories of learning and instruction can help us to make good educational decisions. However, the bottom line is that if we are unable or unwilling connect with as our students and build relationships with them by understanding their learning and communication practices, and applying this understanding to classroom practices, no amount of energy, money, research, or mandates will increase student achievement or address the challenges of state standards or No Child Left Behind.

References

- Bransford J.D., A.L. Brown, and R.R. Cocking, eds. 1999, *How People Learn, Executive Summary*, National Research Council, <http://www.nap.edu/html/howpeople1/es.html> (accessed June 17, 2004).
- Brewer M., and G. Catafalano, 2003. The changing face of the technology consumer, August, *BrouderBrief*, <http://brodeurbrief.brodeur.com/article.jsp?articleId=12359&industryId=68> (accessed September 1, 2004).
- Bruer, J.T., 1999. In Search of... Brain-Based Education, *Kappan*, <http://www.pdkintl.org/kappan/kbru9905.htm> (accessed June 14, 2004).
- Byrnes, J., 2001. *Minds, Brains, and Learning: Understanding the Psychological and Educational Relevance of Neuroscientific Research*, p. 185. New York: The Guildford Press.
- Cairncross, F., 1997. *The death of distance*. Cambridge, MA: Harvard Business School Press
- Center for Social Media, 2001. *TeenSites.com: A field guide to the new digital landscape*. http://www.centerforsocialmedia.org/cme/teen_sites.htm (Accessed August 27, 2004)
- Chinadaily*, 2004. Rules to intercept unwanted messages.

http://www2.chinadaily.com.cn/english/doc/2004-04/16/content_324043.htm
(accessed September 1, 2004).

Heuer, R.J., Jnr. (2004). *Memory: How Do We Remember What We Know, Psychology of Intelligence Analysis*, 1999,
<http://www.odci.gov/csi/books/19104/index.html> (accessed August 2004).

Jukes, I., A. Dosaj (2004). Digital Kids, Learning in the New Digital Landscape, June,
<http://www.thecommittedsardine.net/infosavvy/education/handouts/handoutsmain.asp> (accessed September 1, 2004).

Lenhart, A., 2004 (a). Generation IM: Teens and Technology. *Pew Internet and American Life Project*. http://www.pewinternet.org/PPF/a/100/about_staffer.asp
(accessed March 2004).

Lenhart, A., 2004 (b). Teen, Students, Parents and Internet Technology. *Pew Internet and American Life Project*.
http://www.pewinternet.org/PPF/a/100/about_staffer.asp (accessed March 29, 2004).

Lenhart, A., 2004 (c). Teenage Life Online. *Pew Internet and American Life Project*. http://www.pewinternet.org/PPF/a/100/about_staffer.asp (accessed March 29, 2004).

Maxwell, M.G., 2004. *Learning and thinking: what science tells us about teaching*.
<http://www.studentfriend.com/onhist/learning.html> (accessed September 1, 2004).

Monitor Today (2004). America Online Inc.'s Second Annual Instant Messaging Trends Survey, August 24, <http://www.monitortoday.com/News-2004/2004-08-24.12.html> (accessed September 1, 2004).

National Institute of Media and the Family, 2004. Fact sheet: Watch what your kids watch. http://www.mediafamily.org/facts/facts_childandtv.shtml (accessed August 29, 2004).

National Institute of Media and the Family, 2004. Fact sheet: Children and television. http://www.mediafamily.org/facts/facts_mediause.shtml (accessed August 22, 2004).

National Institute of Mental Health (2004). *Teenage Brain: A work in progress*, 2001, <http://www.nimh.nih.gov/publicat/teenbrain.cfm> (accessed 22nd July, 2004).

Organization for Economic Cooperation and Development, 200. *Understanding the Brain - Towards a New Learning Science*, May 2004, http://www.oecd.org/home/0,2605,en_2649_201185_1_1_1_1_1,00.html (accessed June 27, 2004)

People's Daily Online (2003). 8.2 Billion Short Messages Sent Last Month in China. (February 21). http://english1.people.com.cn/200302/21/eng20030221_112001.shtml (accessed August 31, 2004).

Prensky, M. 2001 (a) Digital Natives, Digital Immigrants Part 1, *On the Horizon*, September/October, 9 (5). <http://www.marcprensky.com/writing/default.asp> (accessed March 2004)

Prensky, M. 2001 (b). Digital Natives, Digital Immigrants Part 2, *On the Horizon*, September/October, 9 (6). <http://www.marcprensky.com/writing/default.asp> (accessed March 2004)

Prison Planet.tv (2004). China extends text message surveillance. <http://www.prisonplanet.tv/articles/july2004/070204chinaextends.htm> (accessed August 2004)

Putnam R.D., 2001. *Bowling alone: The collapse and revival of American community*. Simon & Schuster.

Stepp L.S., 2004. Away messages keep users in touch. July, 9. *MSNBC. Washington Post highlights*. <http://msnbc.msn.com/id/5404762/> (accessed August 31, 2004).

Rushkoff D., 1999. *Playing with the future: What we can learn from digital kids*, 47-53.

US Census Abstracts, 2003. US Society: *Census and demographics*.
<http://www.usembassy.de/usa/society-demographics.htm> (accessed July 24, 2004).

FOR MORE DETAILS CONTACT:

Ian Jukes

Cell: 250-462-0767

Fax: 250-490-4969

E-mail: ijukes@mindspring.com (Ian Jukes)

Check out the Committed Sardine Blog at:

<http://homepage.mac.com/iajukes/blogwavestudio/index.html>

Web sites

<http://www.infosavvygroup.com>

<http://www.ianjukes.com>

<http://www.thecommittedsardine.net>

OFFICE MANAGER

Lori Anderson

Office: 250-717-0998

Fax: 250-717-0999

E-mail: ijukes@shaw.ca (Lori Anderson)

Copyright Policy:

This handout, and materials published on The Committed Sardine web site may be duplicated in hard copy format for educational, non-profit school district use only and must include this copyright policy. All other uses, transmissions and duplications are prohibited unless permission has been expressly granted.