

Closing the Digital Divide:

7 Things Education & Educators Need to Do

By Ian Jukes, The InfoSavvy Group and Ted McCain, Cystar

© The InfoSavvy Group, May, 2008

Please note that this is a first draft. Inevitably there are still some typos. Two things: first don't use the typos as an excuse to dismiss the content; and secondly, don't just notice them, let us know so that we can fix them. You can send corrections to me at iajukes@mac.com.

Synopsis

According to a recent NCES study 60% of minorities in America do not successfully complete grade 12. Shame on us! If we were a business and 60% of our product was defective, we wouldn't stay in business very long.

Beyond this a mere 39% believe that school work will have any bearing on their success in later life; only 28% of 12th-grade high school students believe that school work is meaningful; 21% believe that their courses are interesting; and.

And what makes these statistics even more shocking is when one realizes that these are only the opinions of those students who have remained in high school for four years. Students who have found the high school experience the least relevant have already exited the system in huge numbers.

We say shame on us. If we ran a business and 30 or 40 or 50% of our product was defective, we wouldn't stay in business for very long. So how do we address the Digital Divide?

The Gap Between Digital Learners & Traditional Teachers

Let's try to summarize what digital bombardment has done to the digital generation. Let's summarize once more what writers like Steven Johnson, Marc Prensky, Daniel Pink, and others say about the learning styles of digital learners:

Digital Learners prefer:	Many educators prefer:
receiving info quickly from multiple multimedia sources.	slow & controlled release of info from limited sources.
parallel processing & multi-tasking.	singular processing & single or limited tasking.
processing pictures, sounds color, & video before text	to provide text before pictures, sounds & video
random access to hyper-linked multimedia information	to provide info linearly, logically & sequentially.
to network simultaneously with many others	students to work independently before they network & interact
to learn "just-in-time"	to teach "just-in-case"
instant gratification & immediate rewards	deferred gratification & delayed rewards
learning that's relevant, active, instantly useful & fun	feel compelled to teach to the curriculum guide & tests

- 1. Digital Learners prefer receiving info quickly from multiple multimedia sources. Many educators prefer slow and controlled release of info from limited sources.**

Today's generations operate at twitch speed due to constant exposure to video games, hypertext, and all of the other experiences that reflect an increasingly digital world together with an expectation that they will have access to this world. As a result, Digital Learners have had far more experience at processing information quickly than we do, and they're better at dealing with high-speed information. To coin a phrase from the movie *Top Gun*, Digital Learners have "a need for speed," but many teachers only feel comfortable processing information at conventional speed. As a result, after spending hours of their lives playing video games, using digital devices and wandering around in virtual worlds, many Digital Learners literally run into a wall when they come to school and are forced to slow it down or dumb it down in order to function.

Educators can foster negotiation skills when they bring together groups from

diverse backgrounds and provide them with resources and processes that insure careful listening and deeper communication.

2. Digital Learners prefer parallel processing and multi-tasking. Many educators prefer singular processing and single or limited tasking.

From the earliest times we've always been able to multitask. This is called continuous partial attention and involves randomly toggling between tasks deciding which one to do next. For example, we can be driving in the car, listening to music, checking the rearview mirror, talking on a cell phone and thinking about things you have to do. But now in our increasingly digital world, this stuff happens faster.

Ian can personally remember his parents coming into his bedroom and telling me to turn off the radio because He was supposed to be studying. He remembers being told by teachers that the best way to study was to isolate himself from the television, the tape player, and the busy sidewalks outside the window. He was told to clear a nice study corner, with a comfy chair, good lighting, and ample workspace.

Contrast that with the ways things are today. Just walk into a Digital Native's bedroom today. They will be sitting at a computer, doing their homework, watching American Idol, listening to music, burning a CD, searching for something online, while simultaneously managing 14 instant messenger conversations...and they're still bored. In fact, many students will tell you that doing this all at the same time helps them concentrate.

3. Digital Learners prefer processing pictures, sounds color, and video before text. Many educators prefer to provide text before pictures, sounds, color and video.

For generations, graphics were generally illustrations, accompanying the text and providing some kind of clarification to a concept. For Digital Natives, the relationship is almost completely reversed. The role of text is to provide more detail to something that was first experienced as an image.

Since childhood, the digital generation has been continuously exposed to television, videos, and computer games that put colorful, high-quality, highly expressive graphics in front of them with little or no accompanying text. The result of this experience has been to considerably sharpen their visual abilities. They find it much more natural than our generation to begin with visuals, and to

mix text and graphics in richly meaningful and personal ways. Digital learners need to be able to communicate as effectively graphically as we were educated to communicate with text. And visual fluency - needs to be embedded into every subject and every grade level. And be the responsibility of every teacher from Kindergarten to Post Secondary.

4. Digital Learners prefer random access to hyper-linked multimedia information. Many teachers prefer to provide info linearly, logically and sequentially.

Buckminster Fuller once wrote "How often I saw where I should be going by setting out for somewhere else." The under-30 generation is the first to experience hypertext and "clicking around" in children's computer applications, in CD-ROMs, and on the Web. This new information structure has increased their awareness and ability to make connections, and has freed them from the constraint of a single path of thought, and in our humble opinion is generally an extremely positive development.

At the same time, it can be argued with some justification that unlimited hyperlinking may make it more difficult for students to follow a linear train of thought and to do some types of deep or logical thinking.

For Digital Learners, their mindset goes something like "Why should I read something from beginning to end, or follow someone else's logic, when I can just 'explore the links' and create my own?" While following one's own path often leads to interesting results, understanding someone else's logic is also very important. While the Internet may be far superior for quickly finding related bits of information, for understanding a topic deeply, it still requires the ability for extended focus and reflection.

5. Digital Learners prefer to network simultaneously with many others. Many educators prefer students to work independently before they network and interact.

When we were students, we were expected, at least in the beginning when new information was being introduced, to work independently. When we were out of school, the only ways we communicated with others was face to face or by phone.

Digital natives have grown up with literally dozens of ways to communicate. From cell phones, to MySpace, Friendster, Facebook, YouTube, blogs, Instant Messaging and so on they need, want and expect to be able to instantly and

seamlessly communicate with others using tools of personal and mass collaboration - and they take for granted that this kind of access to others will be available 24-7.

6. Digital Learners prefer to learn “just-in-time.” Many educators prefer to teach “just-in-case.”

Schools are organized around just-in-case. Just in case it's on the exam. Just in case you need to know something to pass the course. Just in case you want to become a scientist or an astronaut. Digital Learners prefer to learn just in time. They want to gain an understanding of the things that they need to know to allow them to acquire the necessary skills and knowledge just in time to play a game or how to do something they don't know how to do. Just-in-time learning is about having the skills, knowledge and habits of mind that will allow them to learn just in time when that next window of opportunity or area of interest opens to them.

A classic example of just-in-time learners happens when a Digital Learner purchases or receives a new game or digital device.

Do they read the manual from cover to cover like many of us do? Of course not! They pick it up and start messing around with it, pushing buttons and exploring the interface. By the time we've read the table of contents, they've figured out ten things that work and ten things that don't work. Then they immediately go out online searching for blogs, user groups, cheat sheets and message boards to figure out what else they can do; or the text or Skype their friends to get the information they need.

7. Digital Learners prefer instant gratification and immediate rewards. Many educators prefer deferred gratification and delayed rewards.

The digital culture provides exactly what kids need most - constant affirmation, lots of attention and the ability to distinguish themselves. Games and digital technology tell the user that if they put in the time and master the game or device, they will be rewarded with access to the next level, with a win, or a place on the all time high scorers' list. What they do determines what they get, and what they get is obviously intrinsically worth the effort they put in.

New technologies excel at giving instant feedback, and the payoff for any action is typically very clear. Compare how often Digital Natives are expected to make decision while gaming (every $\frac{1}{2}$ to 1 second) and how often they are

rewarded for those efforts (every 7 to 10 seconds) with how often students are asked to make a decision or positively rewarded in schools. This may be one of the reasons that many students are waiting for a video game or Internet version of school to come out so they won't have to attend any more.

8. Digital Learners prefer learning that's relevant, active, instantly useful and fun. Many educators prefer feel compelled to teach to the curriculum guide and tests.

While often derided in the press as being intellectual slackers, in reality Digital Natives are very much an intellectual problem-solving generation. Many types of logic, challenging puzzles, spatial relationships, and other complex thinking tasks are built into the computer and video games they enjoy. While some have argued that play and games are simply preparation for work, for today's younger generation, play is work, and work is increasingly seen in terms of games and game play. They want their learning to be relevant and instantly useful. They want to know what possible connections this has to them and their world? And more than anything else, they don't see why this can't be fun most of the time.

What does this mean for schools?

What should be clear from the research and what we have said and shown you is that there is a growing disconnect between the learning preferences of digital kids and the teaching and assessment preferences of traditional teachers.

Ask yourself this question - why are kids in our classrooms? Would kids be in your classrooms if they didn't have to be there? Are they there because they want to be there or are they there because they have no other choice?

And if they're there only because they HAVE to be there, what can we begin to do differently starting right now to help more students want to be in our classes more of the time?

As Mike Josiah says, anyone who knows anything about learning knows that the secret to success in the classroom is not about being a good disciplinarian and has everything to do with engagement and motivation. It's not just about GETTING them to learn, it's about getting them to WANT to learn - without motivation there is no learning.

But because of the huge gap between their digital learning styles and digital learning preferences and education's non digital perspectives about teaching,

learning and assessment, despite our best of intentions to do what is right for kids we are failing mainly because our instruction is targeted at kids from another age.

Digital kids are increasingly experiencing a digital world that is increasingly - some say completely - out of synch with traditional approaches and assumptions about teaching, learning and assessment.

And we believe that this is an absolute recipe for disaster. Kids are increasingly voting with their feet and their mind.

According to a recent NCES study 60% of minorities in America do not successfully complete grade 12. Shame on us! If we were a business and 60% of our product was defective, we wouldn't stay in business very long.

Beyond this a mere 39% believe that school work will have any bearing on their success in later life; only 28% of 12th-grade high school students believe that school work is meaningful; 21% believe that their courses are interesting; and.

And what makes these statistics even more shocking is when one realizes that these are only the opinions of those students who have remained in high school for four years. Students who have found the high school experience the least relevant have already exited the system in huge numbers.

We say shame on us. If we ran a business and 30 or 40 or 50% of our product was defective, we wouldn't stay in business for very long.

So with this in mind we want to outline seven major changes we believe educators and education must immediately make if we ever hope to effectively re-connect and communicate with the digital generation and in doing so, to leverage their digital preferences and learning styles and adequately prepare them for the fundamentally different world of the 21st century

1. It's Time For Educators And Education To Catch Up

Educators must become learners and discover the digital world. But once again we want to stress that we're not suggesting that you throw out everything you believe in or have been teaching for years.

YES it's essential for kids to learn the traditional curriculum and YES it's essential for them to have traditional literacies. The traditional curriculum is how we transmit culture from one generation to the next. But traditional literacy is no longer enough.

We can't close our minds to other possibilities - to other research driven approaches for teaching, learning and assessment because they are not the way we've always done it.

And it's not as some educators, parents and politicians believe a matter of either/or, us or them, our generation or theirs, our priorities or theirs, our way of learning or theirs, our way or the highway.

Kids are different - neurologically different, and as a result they see the world differently than we do. But many educators only pay lip service to this notion. When told that kids are different, educators knowingly nod their heads - uh huh -yup - but then they shut the door to the classroom and go back to business as usual - and it could just as easily be 1960 all over again.

The bottom line is that many people of our generations really don't understand their digital world and we never will until we take the time to honor and respect where they are coming from.

But to do this requires that teachers have a REAL understanding of 21st Century digital culture. And more than just understanding, we need to be able to use the very 21st century tools and skills that educators and Friedman and Pink tell students they'll need to have in the culture of the 21st Century.

And knowing about the digital culture is about more than just rhetoric - this is about more than just talking about change and flapping our lips. This is about the application of the 21st century skills by educators. To actually going from talking change to walking it. Let's be clear that we will never have the level of technical skills Digital Kids have, but there are many other things that we can do that they can't - we have our wisdom to share with them - but this requires us to be walking change not just talking it.

As an aside, we'll help you. You can commit yourself to a 25 Week Digital Diet where every week you're asked to learn and do some new and different digital tool. Each week the challenges become larger, but you do it by taking baby steps.

First you learn a new tool. Then you learn how to use the tool. Then learn to use the tool to create your own digital resources and content. You can download the *25 Week Digital Diet* from the handout section of Ian's web site at <http://www.ianjukes.com>.

So what kinds of learning activities, what kinds of tools are we talking about here?

First go out on line and read the adventures of teenager Jeremy and his long-suffering digital immigrant parents in the cartoon strip Zits. We don't know who the writers are but they absolutely nail it every day.

To gain an appreciation of the amazing visual skills, lightning quick reflexes, and rapid-fire decision-making ability that digital kids have, try playing video games with them even if they will inevitably kick your butt.

And to really get a feel for their remarkable ability to handle the simultaneous bombardment of multiple forms of information play those video games while music is playing at bone jarring levels and a movie is running in the corner of the screen.

Take the time to explore their online worlds. Try to familiarize yourself with what they're doing and how they're doing it. Take a close look at what Digital Natives are doing with video at YouTube.

Go download some photos from Flickr.

Take a look at MTV's "The N" and learn about the latest trends - vomenting and video mashups - visual commenting where they add commentary to video via text blurbs or audio clips,

Go out to Wikipedia and search for something of personal interest that's really obscure. Then head write a wiki of your own on some area you're knowledgeable in.

Download ring tones to your cell phone.

Go out to Technorati or the iTunes store to find, download, and listen to podcast. Then create a podcast of your own.

Read and respond to a blog then create a blog of your own. Learn how to use Instant Messenger.

Make a phone call or videophone call using Skype or iChat.

Play a massively multiplayer on line role-playing game like Everquest, World of Warcraft, or Maplestory.

Create a personal avatar and attend a course virtually at Second Life, Club Penguin or WebKinz.

Become a thumbster on your cell phone.

Open a MySpace or a Facebook account.

Log on to Craigslist or eBay and spend some time exploring the amazing range of goods available for purchase.

Beyond this, it's also important that you appreciate the learning potential of the online world, so pick a skill that your students would like to master like playing the guitar or learning how to fix a mountain bike. Search the Internet for sites that will help you develop that skill.

Go to Del.icio.us and create a Tag Cloud.

Go out to TeacherTube and watch a Physics or Chemistry experiment or learn how to write Haikus.

The list goes on and on. Every day there are more tools and resources appearing. And remember, this is just the tip of a very large and growing iceberg of tools and resources.

But, on the other hand, if you have no idea what we've been talking about for the past few minutes - if we appear to have been speaking in tongues - then you have just caught a glimpse of the gap between you and them and you have confirmed your digital immigrant status.

You are beginning to see the breadth and depth of your personal digital divide. This divide is much less about have and have nots or the know and the know nots - and more about the generational divide between the way their generation and our generations look at the world - so catching up to them is really important.

2. Teachers Must Teach to the Whole Mind

As Daniel Pink writes, it's about the whole new mind - not just to the traditional linear logical, left to right, top to bottom beginning to end left side of the brain which is the hallmark of education today.

But this is a great challenge in the age of high stakes testing and No Child Left Untested. Consider typical classroom instruction today. The primary focus is on typically memorization. The products are mainly traditional reports and tests. As students progress through the system it's ASSUMED they will pick up critical thinking skills.

The problem is that everyone thinks it's someone else's job. Elementary teachers assume that kids will be taught the critical thinking skills at the high school level. But secondary teachers think that this should have already happened at the elementary level - and besides, second teachers don't think they have time to teach critical thinking skills because they have the curriculum to cover.

Most teachers judge their success as teachers on how the top third of kids in their classes do. But many of the top third really don't need to be taught, They tend to learn things on their own, they know things intuitively, they're on the honor roll, And if we're really honest we'll admit that many of them learn in spite of teachers and school, not because of them.

The REAL test for teachers is not our top 1/3rd of our students; it's what we're able to do with the kids in the bottom 2/3rd. They're ones that need to be taught.

But instead of seeing them as an exciting challenge some teachers view the bottom 2/3rds as a problem - as the kids that need to be fixed. These students require time, they require energy, they require new strategies, and they require special attention.

They're the ones that get shipped off to special ed and learning assistance, because they don't respond to the traditional one-size-fits-all teaching strategies. That's why there are kids who absolutely fail in our system as they fly below the radar - then they go out and are hugely successfully

Think about tests. They're primarily fill-in-the-blank, multiple choice, and short answer questions, simple answers that are easier to mark.

Then consider the language of the questions on the test. What kinds of verbs do we see? Verbs like *identify, name, list, define, explain, describe* - verbs that primarily reflect low level left-brained recall and regurgitation of facts. Verbs that reflect the lower end of Bloom's Taxonomy - not verbs such as *analyze, synthesize, apply, infer, interpolate*.

The primary sources are textbooks, black and white handouts, worksheets, test prep material. Materials that are decidedly non-technological, slow paced, twentieth century tools and environments. Cell phones, iPods and social networking tools that are an everyday part of digital natives' lives outside of school aren't used - in fact in many cases they're heavily restricted or banned. In banning access to their personal tools we are absolutely missing a huge opportunity to connect with the digital culture - we're whiffing the ball. In the digital culture this kind of learning is *SO boring and SO irrelevant* for most kids that they have to power down when dealing with teachers. Digital kids spend hours before and after school playing games and wandering around in virtual worlds and networked environment and using social networking tools; and then come to school where they are often confronted by the awesome power of an overhead projector or dry erase pen and a whiteboard

Beyond that it's also **ABSOLUTELY** not preparing kids for the world they will graduate into.

What are the skills kids need today? What are the dynamics of the working world?

First, as Friedman writes, there has been a shift in emphasis away from rote memorization to the higher level thinking, creativity and the problem solving that happen primarily in the right side of the brain. A shift to a skill set that was exclusively for the subset of management in the 20th Century. In the 21st century everyone needs to have the higher-level thinking, creativity and problem solving skill set.

As Daniel Pink writes in a *Whole New Mind*, it's about moving beyond 20th Century literacies like reading, writing and numeracy. In an age of multimedia, hypertext, blogs, wikis, and much more, reading is no longer a passive, linear activity that simply deals with text. And writing is no longer just about being able to communicate effectively with written or spoken text.

Rather it's about having a wide range of different skills needed to function within a rapidly changing society. For a long time our schools have placed a great deal of emphasis on training our students to be good consumers of traditional

content by becoming good readers, writers and learners.

In the age of digital content, success is about teaching our children to also become good and responsible producers of content - writers, artists, composers, etc - to be prosumers - simultaneous producers and consumers of content.

In the information age, citizens will need to work with information in all forms to fashion content products that have value, that entertain and teach. But if all learners do is read, write and calculate, they may be literate by 20th Century standards but certainly not by 21st Century standards. And as Friedman and Pink write, if they leave school with only 20th Century skills they will absolutely not be prepared for what awaits them after they finish school as a citizen, a family member or a worker.

To prepare them for their future, we need to move beyond literacy to an expanded list of 21st century fluencies. Let me distinguish between literacy and fluency. When you are literate you still have to think about what you have to do next. Fluencies are unconscious skills. You don't even have to think about them. You just intuitively know what to do.

It's like riding a bike - you don't have to think about it - you just get on and ride.

The 21st Century fluencies our students must have and our teachers must understand and be able to teach include:

Technological Fluency

Technological fluency involves the transparent use of digital tools to perform a wide range of tasks. It's like using a pen. You don't think about the pen, you just use it. With a pen, it's about being directly engaged between the tool and the task - between your brain and the paper. With digital technology, it's not about learning Excel - it's about using Excel to solve a problem. It's not about using Word - it's about using Word to write. It's not about PowerPointlessness - it's about using PowerPoint to communicate effectively.

In each case, the primary focus is not on the cards and cables, not about RAM and ROM, not about hardware and software, not about the tool but the task that needs to be accomplished. The primary focus is on headware not hardware - critical thinking, problem solving, and decision-making. A focus on headware

rather than hardware means learning about the technology is nothing but an incidental but essential byproduct of that process.

For example if you're in the magazine industry you might need a specific photograph. You're not thinking, "I need to learn to use a digital camera". Rather, you're thinking, "how can I use the digital camera to take the photographs I need?" You learn to use the camera - that's the means to the end - to take the needed photographs - which is the end.

The task drives the use of the technology. Learning about the technology is nothing but an incidental but essential byproduct of that process.

Next there's:

Media Fluency

Media fluency is not just about the ability to operate a digital camera, create a podcast, or build a Power Point presentation, or write a document, It's about being able to look critically at the content of a web site, a PowerPoint presentation, a podcast, a video, a blog, a wiki, a TV show, a newscast, or a video game - and be able to understand how that particular medium is being used to communicate with the users. It's about how the media is used to shape our thinking.

And it's not just that a particular medium is being used or about how it's being used, it's about how well the medium is being used to communicate the message.

But media fluency is not just for passive viewing. We live in an interactive visual world. It's also about digital natives creating and publishing original digital products that help them communicate as effectively with visual & auditory elements as we were taught to communicate with text

The problem is that many digital natives outwardly appear to have exceptional technical and media skills which belie the fact that they have large holes in their understanding of the tools and techniques for effective communication. The Internet is a wasteland of digital products created by people who have little or no understanding of how to construct digital documents that communicate their messages effectively.

At the same time, it's critical for educators to understand that excellent writing skills are not enough to be good communicators in a multimedia world. Effective communication is about more than just traditional products like a

handwritten or typed report on the symbolism in the Lord of Flies.

That's why we need to challenge students to create digital products as outcomes that not only reflect an understanding of the necessary content. Not only to develop technical skills such as using a video camera, designing a web site or making a presentations - but also provides them with the empowering principles of graphical design, color theory, video editing, and the use of apparent motion to help them to do things better and to fill in those holes in their Swiss cheese understanding of media.

We have to note that most of these skills are either not taught in school or considered secondary, optional or elective if they are taught at all. In the 21st Century those skills need to get a promotion - and they can't be considered optional. In the 21st Century they need to be every bit as important if not MORE important as history, mathematics, and English literature.

The difference here is that instead of submitting an essay written by hand, students will use a word processor, film, blog, podcast, wiki, or any other of a wide range of other digital products. Teachers need to understand that these new products we're describing are not just fads - they're essential building blocks of communications and understanding for the 21st Century. In the culture of the 21st Century all students need to have these media fluency skills.

Finally there's:

Information Fluency

Information fluency is the ability to unconsciously and intuitively interpret information in all forms and formats in order to extract the essential knowledge and perceive its meaning and significance. There are 5 distinct steps to the process - what we call the 5 A's.

First the researcher needs to be able to Ask good questions. If the researcher can't ask good questions, they will not get good answer.

Once you have good questions, then based on those questions you have to be able to Access and Acquire raw material from the most appropriate high tech, low tech and no tech sources. This is not just about going to the card catalog and getting a book - this is about YouTube, Wikipedia, music, or interactive web sites.

Digital resources are more and more the raw materials of the 21st C. More and more of these raw materials are graphical and audiovisual in nature. It's no longer just the traditional paper based resources of our youth.

Then to be able to Analyze and Authenticate the acquired data to distinguish between the good, the bad and the ugly of information - to distinguish between fact and opinion - to understand bias - and in the process to turn the data into usable knowledge.

Then to be able to Apply the knowledge within the context of a real life, real world problem or a simulation of that problem - to build a bridge, write an essay, complete a science experiment, or perform in a debate. At this stage the researcher is asked to move from theory into practice.

And finally the researcher is asked to Assess both the product and the process. What was learned, how was it learned, how could we make this process, how could we make this product better the next time around? And understanding that Assess is not just a teacher task, it's also a learner task.

As you can see we don't hold strong opinions about these things. We believe that information fluency is the absolute backbone of education and needs to be taught in the same structured manner that Math, science, social studies and language is taught. Taught at every grade and every subject area by every teacher from Kindergarten through to senility.

Two related resources of interest can be downloaded from the handout section of <http://www.ianjukes.com> - they are:

1. *21st Century Fluency Skills: Attributes of Digital Learners*; and
2. *21st Century Fluency Audit Tool*.

But we have to be clear that if all we do is add another layer of curriculum nothing will change. In order to help students learn these 21st Century fluency skills the next thing that needs to be done is:

3. Educators Need to Shift Their Instructional Approach

There has to be a shift away from the predominant left-brained traditional stand and deliver, full frontal lecture approach of the 20th Century. We must resist the temptation to tell the whole story and must stop giving them the end product of our thinking.

The problem with telling is that it takes the excitement of discovery out of learning. Telling someone something removes the first hand experience just like when someone tells you the ending to a suspenseful movie you're about to watch. Telling also eliminates the motivation for learning. When we tell the whole story, there's no necessity to go out and get the skills and information because someone is going to tell you what you need to know.

Now let's be clear, there absolutely IS a place for telling - it can be very useful when you have to deliver a lot of content. But we need to shift our instruction from predominantly full frontal lecturing to more of an emphasis on discovery learning.

In essence, we need to learn to teach lazy. Our job as educators should not be to stand up in front of students and show them how smart we are. Our job as educators is to empower them to become independent thinkers. To be men & women who are capable of thinking outside the lines - of doing new & creative things, not simply repeating what other generations have done before them.

We need to invoke a fundamental policy of progressive withdrawal into their lives. Let me explain why.

When children come to us in kindergarten there are completely dependent on us to tell them what they need to do - and if we continue to focus primarily on content, and memorization and value that as being more important than thinking for themselves, they are still completely dependent on us in Grade 12 to tell them what they need to do to pass the test, pass the course, pass the grade and graduate.

And then when they leave us after 13 years of schooling and they fall flat on their faces as many of them do, we can't understand why it happened. It's our fault. Because from kindergarten on we've focused on, we've maintained, a culture of dependency - a dependency on the teacher, the textbook, the test.

Our job is to make sure they don't need us by the time they graduate from our schools. Our job is the same as being a parent. Think about a child's very

confident steps. What does it look like...WOBBLE, WOBBLE, LURCH...

What's inevitably going to happen? CRASH!

So when they do fall over, do we rush over to them and say C-, 36 percent, I'm sorry you've had three chances, you don't get any more...?

Of course not! What do we do? CLAP, CLAP, CLAP. We help them up we brush them off, we encourage them to try again. Why? Because our job, as difficult as it may be, particularly during their teenage years, is to help them to become independent and self-reliant.

So why do we know that intuitively as parents, but in schools we continue to hang on tight - to cultivate and maintain our culture of dependency - dependency on the teacher, the textbook, the test.

We need to teach lazy. We need to use progressive withdrawal. We need to move from being the sage on the stage to being the guide on the side - the facilitator of learning.

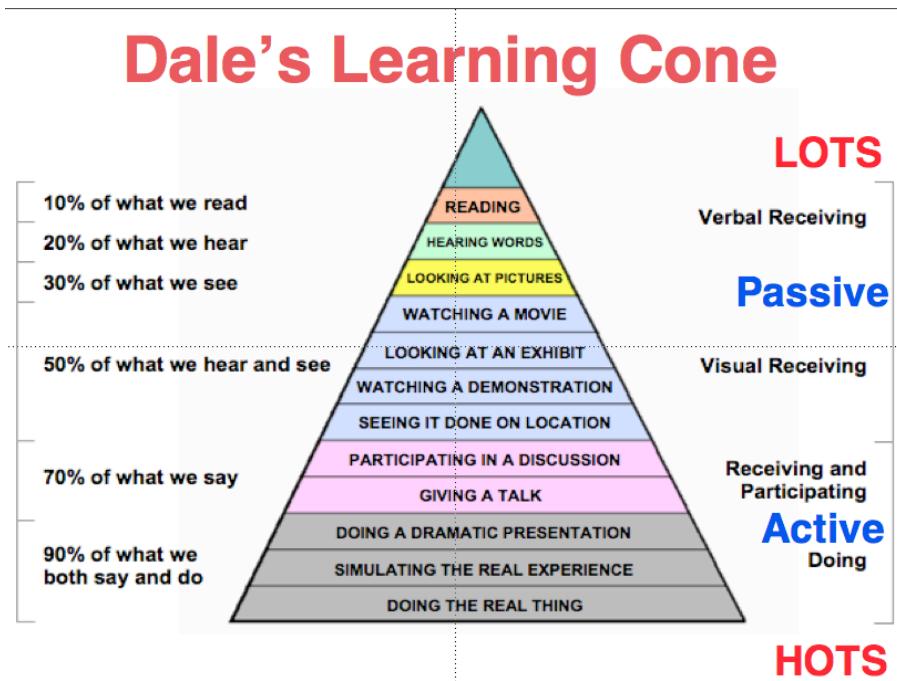
Why? Because today we live in an age of InfoWhelm where accessible data is growing at exponential rates. As a result, it's just not possible for teachers to be the experts they once were or to keep students engaged.

It was increasingly difficult to be an expert during the 20th Century. With the emergence of digital media, the Internet and InfoWhelm being an expert has become impossible in the 21st C. But despite the fact that we now live in an age of InfoWhelm, students continue to spend the vast majority of class time being lectured to. The primary focus is on LOTS - lower order thinking skills, simple data information recall, memorization and lots of information.

Dale's Learning Cone

This is Edgar Dale's Learning Cone, first developed in the 60's but reaffirmed by the research and adapted again and again - other derivatives of it are also known as the learning pyramid, or learning triangle

:



What their research tells us is that on average after two weeks we recall:

- less than 10% of the content of what we read,
- about 20% of what we hear, like from a lecture
- 20 to 30% of content simultaneously using two or more media, like looking at pictures or watching a movie
- about 30% of lessons involving demonstration
- about 50% of content that we hear and see like while watching a demonstration that uses two or more media simultaneously
- 65-80% of content that involves practice by doing like participating in a discussion or giving a talk
- and about 90% that involves the teaching of a concept to others as well as the immediate application of the learning within the context of a real time, real world task or a simulation of that task

All of this operates on a continuum from passive receiving of information and traditional learning with a primary focus on LOTS (lower order thinking skills) to active participation and engagement with information, and a focus on HOTS (higher order thinking skills).

Standardized Tests For Non-Standardized Brains

In the face of this research, we need to acknowledge that we're continuing to use standardized, traditional tests to measure increasingly non-standardized brains. We're literally trying to fit round pegs into square holes, and square

pegs into round holes.

It's not that students have ADD or ADHD. Outside of the US, Canada, Britain, Australia and New Zealand we have almost no cases of ADD or ADHD - which here has become the official overmedicated brain syndrome of the information age.

The real problem is that they're just not interested, not listening and increasingly tuning us out.

We hear teachers complain all the time that kids have short attention spans - that students just can't focus - that they can't even remember the names of the state or the capitals when asked.

Meanwhile that same student is thinking, "Why do I have to know this when I can Google the answer in 2 seconds."

And the same kid who can't remember can instantly and enthusiastically remember the lyrics to 1000 songs or the characteristics of 100 video game characters. Their attention spans aren't short for games or music, or anything else that actually interests them. They just have short attention spans for old ways of teaching, learning and assessment of that learning.

The problem is that as educators we just don't understand how different digital natives are. They're not just a little different they're completely different. The problem is that today's learners are not the learners our schools were originally designed for. And today's learners are certainly not the students that teachers were trained to teach.

The bottom line is that if we want understanding, if we want retention, if we want success on school exams, state exams, AP or ACT exams, if we want to address and exceed the mandates of NCLB, if we want children to demonstrate proficiency beyond content recall, we can't just lecture to them. The emphasis in the classroom can't just be exclusively on LOTS - lower order thinking skills - simple data information recall - and LOTS and LOTS of information.

If we want our kids to be successful on the test - if we want them to be successful in life beyond being able to successfully complete a written exam - if we want them to graduate as more than just highly educated useless people - people who are good at school but not adequately prepared for life - then our emphasis as professional educators has to be on much more than just content

recall - it has to be on much more than LOTS - we must give them assignments that require higher level thought.

A Focus on HOTS

Our focus has to include HOTS - higher order thinking skills, on Howard Gardner, on Bloom's Taxonomy, de Bono, on critical thinking, problem solving and the 21st Century fluencies and metacognitive skills that move beyond the theory to the application of what is learned by making a fundamental shift to giving problems first and teaching second.

The starting point is to remind you about how truly different their students are and adjust your assumptions about teaching, learning and assessment accordingly.

The biggest gift teachers can give their children is their wisdom. What are the implications? What's the big picture? Where are the connections? How does this relate?

It's important to acknowledge that while many students are technically adept, most of them haven't yet gained the life experiences necessary to understand the broader implications - at least to do this on their own.

In an age of InfoWhelm teachers can' no longer be the content expert but they can be the problem solving expert. And as Edgar Dale's Learning Cone demonstrates context is king, relevance is needed for retention - and it has to be relevant to the learner not just the teacher.

Effective learners make a series of attachments or relationships between their existing knowledge & new information. Richard Wurman calls this Velcro learning.

You see novice learners often just try to remember facts in lists, which we all know is the common strategy for students preparing for quizzes & tests. The problem is that information that doesn't have a context, interest, or relevance or reinforcement is like having only one side of a piece of Velcro - things just don't stick.

True learning can only occur when the brain can make meaning through a series of relevant connections between past experiences and new information. When the two are combined, long-term learning sticks permanently and powerfully to the student - just like Velcro.

4. We Need to Let Students Access Information Natively

Throughout history, education has always struggled trying to come to terms with new innovations and tools that are central to society only to relent later when the educational value of the new innovations and tools became clear.

As examples, Father Stanley Bezuska once noted:

At a teacher's conference in 1703, it was reported that students could no longer prepare bark to calculate problems. They depended instead on expensive slates. What would students do when the slate was dropped and breaks?

In 1815, it was reported at a principal's meeting that students depended too much on paper. They no longer knew how to write on a slate without getting dust all over themselves. What would happen when they ran out of paper?
(And did they think that paper grew on trees? - our comment)

The National Association of Teachers reported in 1907 that students depended too much on ink and no longer knew how to use a knife to sharpen a pencil.

According to the *Rural American Teacher* in 1928, students depended too much on store bought ink. They did not know how to make their own. What would happen when they ran out? They wouldn't be able to write until their next trip to the settlement.

In 1950, it was observed that ballpoint pens would be the ruin of education. Students were using these devices and then just throwing them away. The values of thrift and frugality were being discarded. Businesses and banks would never allow such expensive luxuries.

In 1966 it was noted that electronic calculators would never be able to compete with the computational ability of the human brain.

In 1988 in an article written for the National Association of Secondary School Principals it was declared that there was no good evidence that most uses of computers significantly improved teaching & learning and that most schools would be better off if they just threw their computers into dumpsters.

Cell phones, iPods, and social networking tools are just the latest trends to be thrown under the bus by education.

Social networks are communities of people who share interests and activities. Social networking is primarily web based and provides a variety of ways for users to interact, such as chat rooms, instant messaging, video, voice chat, file sharing, blogging, or discussion groups and so on.

A new National School Board Association study has concluded that digital devices and social networking are now so deeply embedded in the lifestyles of 9 to 17 years olds that it rivals TV for their time and attention.

While these devices and social networking appears to be an everyday part of lives of tweenagers and teenagers outside of school, most school districts have created rules against, or banned outright the use cell phones, iPods and other digital devices, and online activities such as chatting, tagging, instant messaging, bulletin boards, blogging, wikis, sending and receiving email at school, RSS readers, educational video games, or the use of social networks.

In many cases this has been done without efforts being made to first thoroughly understand these devices and tools or considering the enormous potential they have to provide enhanced learning opportunities and improved academic performance.

This widespread blocking of these tools and activities is happening at the same time that in businesses and higher education, social networking and digital devices are commonly being used as the communications and collaboration tools of choice. The report suggests that schools may be missing a HUGE opportunity to leverage digital tools and social networking tools at powerful learning resources and that we need to examine the remarkable educational potential of social networking, chat rooms, instant messaging, blogs, wikis, cell phones, digital tools, streaming video, tagging tools, RSS readers and much more for after-school homework help, review sessions and collaborative projects to enhance learning, teaching and assessment. Next:

5. We Must Let Students Collaborate

Understanding that 21st Century collaboration goes WAY beyond traditional working in groups.

It also means allowing them to collaborate using the digital tools that are an everyday part of their culture. We're not talking about using whiteboards, dry erase colored pen, overhead projector, or even a smartboard.

We shouldn't be banning digital devices; we should be encouraging them to use them. Why? Because we live in a network culture that is the new reality of both business and life

As Donald Tapscott writes in his new book *Wikinomics*, we live in a network age that has fundamentally changed the nature of business. Companies today are using mass collaboration, open source and social networking tools such as wikis, blogs, podcasts and virtual learning environments to be successful.

By coming together and cooperating with competitors to improve a given operation or solve problems. *Wikinomics* is a radical concept by traditional 20th Century thinking. *Wikinomics* is working and it's FUNDAMENTALLY reshaping the face of business

Digital kids do the very same thing in their personal lives with their digital technology, their social networking software and their digital mindsets. They work together in virtual digital mobs to get things done in creative and occasionally unimaginable ways (Ted calls this spontaneous ad hocism). Plans are fluid, so in the course of an evening digital mobs can do 5 things with 5 different groups that Digital Immigrants might not have imagined being able to do in 5 weeks. This happens because they see the world differently than we do and they use their tools differently than we might to create unique digital products.

In the new digital landscape these tools aren't just optional. They are a cultural necessity and a fundamental foundation of 21st Century life. Digital Natives could just as easily be texting with a kid in Afghanistan, Iraq or Venezuela about civil war as someone across town. They could just as easily be videoconferencing on a project with someone from Denmark as someone from somewhere else in the state or province. They can share cultural information with a student in Japan as easily as they can with someone in the next seat. The possibilities are literally unlimited.

6. We Need to Let Students Create Real World Digital Products

We need them to create real world, real time digital products that allow them to reflect their understanding of both content and process. Learning is not just about the content learned; it's also about the context in which the content is used. Learning is not just about end product of the learning but also the process that took place to gain that understanding. Learning is not just about the tool that was used; it's also about how it was used to solve the task.

Digital tools can help with the process of learning and producing the product of learning. And it's not just about using digital tools because kids will like them. The digital tools enhance traditional learning - they're better.

For example, think about producing a magazine. What would be the primary tool you would choose to use - pen and paper or a word processor? Obviously most people would choose a word processor, not because word processing is cool but because it's a better tool for writing.

Think of the 5 steps of the writing process - plan, draft, revise, proof, publish - the word processor is far more effective for each of these steps. This is why modern publishers use word processing exclusively for the writing process.

Consider the tools that are used for creating the end product of publishing - photo manipulation, desktop publishing, web design, and video. These are the tools being used in the workplace, not because they're cool to use but because they are the most powerful tools for producing the end product given to consumers

These are digital natives. We need to let them use their digital tools to demonstrate their knowledge of the subject while understanding that they will probably use these technologies differently than we would and also that they will use it in unexpected ways to create unexpected products. This is how vomenting and mashups became instantly popular in digital culture

By letting them access information natively we acknowledge their culture. Our job is to show them how to be more effective with what they do, even when they take their products further than we can visualize or imagine. They can take it further than we can imagine because they live in different culture - a visual multimedia hyperlinked culture.

So instead of traditional products like a handwritten or typed report on the symbolism in the Lord of Flies, we need to challenge them to create digital

products as outcomes that not only cover the necessary content, not only to develop technical skills such as using a video camera, designing a web site or making a presentation; but also provide them with the empowering principles of graphical design, color theory, video and sound editing to help them do things better and to fill in those holes in their thinking. These are digital natives raised in the new digital landscape.

Because they view the world fundamentally differently than we do they will produce different products than we would; and they will produce products that reflect both the product and the process of their thinking; and that result in the creation of digital products that reflect more of a focus on HOTS, critical thinking, problem solving and 21st Century fluencies rather than just on the traditional LOTS. And finally:

7. We Must Re-evaluate Assessment and Evaluation

While there is still a place for traditional testing, true assessment is about much more than just memorization or content recall or the results of paper-based, fill-in-the-blanks, short answer or bubble tests.

We don't need a pilot who just did well on the bubble test or the written exam because written tests do not generally measure things related to success in life. What we need is a pilot who not only got 100% on the written exam, but can also land the plane perfectly 1000% of the time despite the fact that they may be dealing with mechanical failure, electrical failure, hydraulic failure or the fact that some idiot is trying to kick down the door.

Assessment and evaluation have to be used as more than tools of measurement - they have to be tools of change and learning. They have to be tools of change for both student and teachers. Evaluation has to help both students AND teachers get better at what they do. Assessment and evaluation are not just tools of accountability for external bodies that have little if any understanding of what real learning is about.

Learners need clear and realistic standards, expectations, and criteria to work toward. They need appropriate tools, technologies, and resources to work with; they need lots of modeling, coaching, and mentoring to establish a sense of what quality and success look like.

They need lots of guided and independent practice. They need timely, targeted, non-judgmental feedback on their performance. They need opportunities to make mistakes as they learn and not be penalized for them. And they need authentic audiences in a variety of settings and contexts in which to demonstrate what they can do.

But most of all they need the encouragement to try and to do things in all kinds of performance areas with all kinds of tools, technologies and techniques to create all kinds of products that reflect their understanding of concepts. But for this to happen, we need to rethink assessment and evaluation and go beyond the traditional quantitative summative assessment of learning that doesn't really help the students get better and really doesn't help the teachers other than to scare the heck out them.

Knowing content doesn't make you competent. Competence is the ability to apply content in some useful way. But if we want our students to be competent, we need to rethink assessment and evaluation and go beyond the traditional

quantitative summative assessment of learning that doesn't really help students get better and really doesn't help the teachers other than to scare the heck out them.

Eventually we'll start learning about these new digital tools but in the short run, we need help from people who understand how new media is put together, can evaluate the technical parts, and assess the effectiveness of the product created.

It's not that they are going to mark the projects. Rather, they are there to help teachers learn how to evaluate a movie, the script, the lighting, the green screens, the pacing - skills above and the traditional writing of the script. It is important that we just create another specialist job like learning disabled so I don't have to learn that job.

Knowing content doesn't make you competent. Competence is the ability to apply content in some useful way. But if we want our students to be competent, we need to rethink assessment and evaluation. This is about designing learning opportunities for qualitative formative assessment - self assessment - team assessment - culminating assessment - assessment of what has been learned within the context of a real time, real world problem

Our task is not to do a better job of teaching a curriculum designed for preparing students for life and work the 19th or 20th century. Rather our task to design a different way of teaching designed for preparing students for life, learning and work in the 21st Century.

So How Do We Bridge This Digital Divide?

First we need to roll up our sleeves and acknowledge that there's lots of work to be done. And if we are willing to acknowledge this - if we are willing to meet the digital generation half way - if we are willing to acknowledge and embrace their world, as we expect them to embrace ours, we will set them free. And in doing so, we will be able to leverage their digital lifestyle and help each and every one of them become better, more engaged, more independent learners.

If we want to truly unfold the full intellectual & creative genius of all of our students more of the time - if we want to prepare them for the world that awaits them - if we want to help them prepare for their future, not our past - for their future, not our comfort zone - if our nations are going to march through the 21st Century & maintain its longstanding tradition of success - if

we want our children to have the relevant 21st century skills - we must create a bridge between their digital world and ours.

We live in amazing times, remarkable times, overwhelming times this was beautifully summarized by philosopher Alfred North Whitehead 100 year ago when he wrote:

It is the business of the future to be dangerous. The major advances in civilization are processes that all but wreck the societies in which they occur.

Alfred North Whitehead

And remember that today the long term is measured not in terms of centuries, or decades but in years and sometimes months, weeks, days and hours. We live in a moment in history where change has become so speeded up that we begin to see the present only when it's already disappearing into the past.

Our biggest challenge is and will continue to be comprehending and accepting the scale of change. We're talking about change changing so rapidly that very nature of change is changing

But when changes are happening quickly we tend to want to hang on to old ideas and assumptions about the world. And when we do this, we run the risk of ending up crashing headlong into the future.

This is perfectly summarized by the great philosopher Erik Hoffer when he wrote:

In times of radical change the learners inherit the earth while the learned find themselves perfectly equipped for a world that no longer exists.

Erik Hoffer

Our greatest fear is that at this moment, despite our very best efforts, we are doing a terrific job of preparing our children for year 1960 and we may be being optimistic in saying that.

So what have we being trying to do to you with this handout. At the end of our presentations, we take a large rubber band and we stretch it out and hold it there. After awhile, when our arms get tired, we release the pressure on the rubber band and it snaps right back to where it was before.

Why? Because a rubber band has a mindset, a paradigm, a comfort zone, a place it's been for a long period of time - a place that it likes to be.

So how do you get a rubber band to stretch and stay stretched?

There are several things you can do. You can wrap it around something, you can heat it, you can freeze it, you can rub it with a solvent to change the chemical composition.

The interesting thing is that even after all that effort, when you release the pressure the rubber band still tries to go back to where it was in the beginning.

You see, intellectually we all understand that the world has changed. We nod our heads, and agree that things are different. But, as the old saying goes, "when the going gets tough, the tough get traditional." At an unconscious level without even being aware that we are doing it we can revert back to our old habits and beliefs.

The rubber band effect occurs when your mind recoils from the discomfort of new ideas that are outside your past experience. We tend to unconsciously revert to the status quo and go back to doing things the way we always have. It is a predictable phase that all people go through when dealing with change. You will experience it today, tomorrow or sometime in the near future when you realize the true implications of the new ideas that have been discussed.

And remember, staff development without follow-up is malpractice.

Do you want to read more about this? If so, head out to <http://www.ianjukes.com> and check out the Committed Sardine web site. Handouts, articles, funny photos, reading list, great links and the Committed Sardine Blog which is read by more than 75,000 people around the planet.

FOR MORE DETAILS CONTACT:

Ian Jukes

Cell: 250-462-0767

Fax: 250-490-4969

E-mail: iajukes@mac.com

Check out the Committed Sardine Blog at: <http://ianjukes.com>

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.