Attributes of Digital Learners

Introduction

In the vast technological landscape that is currently redefining our world and the world of our kids' education, an undeniable fact has come to bear. Continuous findings in brain research and learning evaluation tell us that kids today are different....completely different. Not just physically different, but neurologically different.

Because of technological bombardment and the phenomenal trend of InfoWhelm, the digital generation has developed what we call a "cultural brain". This digital exposure has completely rewired the young mind and created a very unique student, and thusly a unique challenge to the tried-and-true educational models that have long been staples in classrooms and lecture halls for more than 100 years. Our students have moved beyond that, and it's time to catch up.
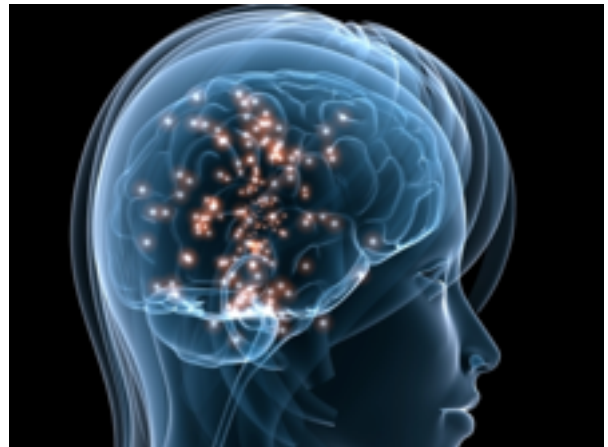
This handout offers a concise glimpse into what makes kids today really different - the way they learn, absorb knowledge and interact with our digital world. You'll come away with a clearer understanding of what neurologically defines a child of the digital generation, and why we could learn just as much from them as they can from us.

A Different World

Kids today are different in so many ways. Not just physically, but neurologically. They are nothing like us when we were students, getting prepared for a world that is quickly being replaced by a vast horizon of digital and technological saturation. Kids are different, because the *world* is different.

Thanks to digital bombardment, and the chronic and pervasive exposure to digital technology, the digital generation has developed what we call a "cultural brain" - a brain that has been profoundly affected by the digital culture to which they are exposed. It seems the brains of the digital generation have been and are continuing to change both physically and chemically. Any time people learn something the wiring in their brain changes. Even simple pieces of information involve the physical alteration of the structure of neurons participating in the process. These physical changes result in the functional organization and reorganization of the brain. The brain is constantly learning things, so it constantly rewires itself like a muscle – the more activity you do, the larger and more complex it can become. What you do in life physically changes what your brain looks like.
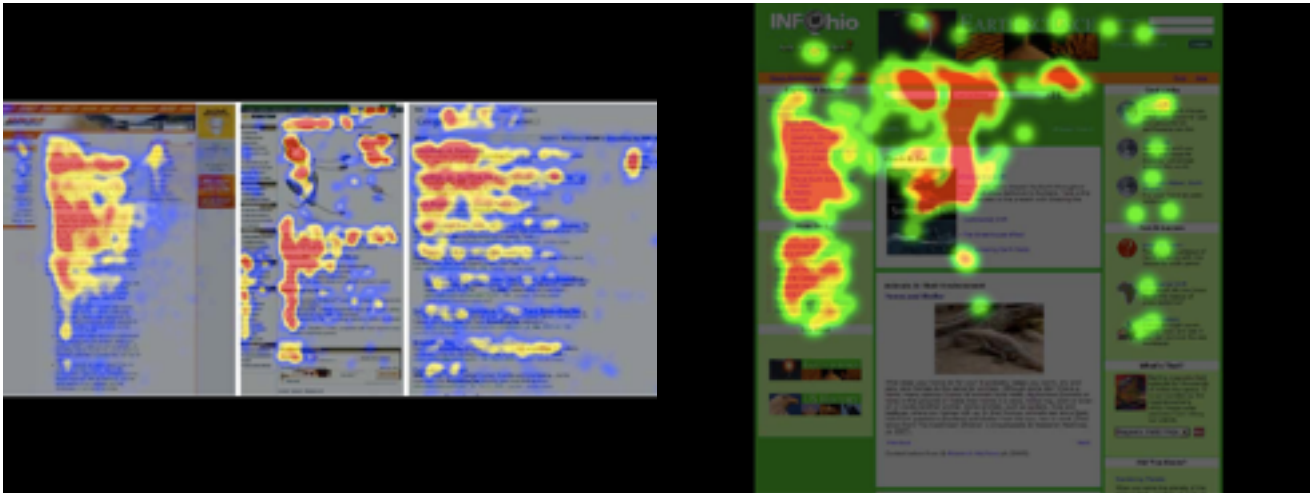
As a result of exposure to this chronic digital bombardment, what researchers are now beginning to discover is that our students are actually neurologically wired differently than we are. They not only see, but also interact with the world differently than we do. This digital generation has developed "hyperlinked minds". Their brains process information in a parallel or simultaneous manner, as opposed to the sequential or linear manner in which our brains function.

This chronic and pervasive digital bombardment causes the brain to become neuroplastic - literally, the brain becomes plastic and malleable. So contrary to traditional assumptions that the brain was stable from about three years of age on, we now understand that the brain is constantly creating new thinking patterns throughout our lives, thus affecting the way we interact with the world. We also know that the eye processes and interprets the content of photographs 60,000 times faster than the eye processes and interprets the content of text.

The Topic Of Text

While our generation reads for information in a classic Z-pattern that moves from left to right sequentially, the digital generation is different. They read in what's called an F-pattern, and the following page shows you how this all looks using FMRI scans (functional magnetic resonance imaging).

These imaging scans tell us that, unconsciously, the brain of the digital reader ignores the right side and bottom half of the page. It turns out readers will only go to those areas of the page if they are highly motivated to do so. The conclusion seems to be that this F-pattern mimics the way kids play video games and surf the web scanning the screen for information. Do you think this holds any implications for designing engaging reading materials which compel students to read the entire page for information?

Here's another interesting fact. It turns out that specific colors of text attract and repel digital learners when they're reading for information. Our experiences growing up and our cultural brains have wired us to favor reading black text on a white background. In fact, many of us find it difficult to read text in any other color or on any other background. It turns out, however, that digital learners' preferences are different. The first choices for text here in North America are blood red or pink text (depending on gender) followed by neon green and then burnt orange. The backgrounds they like best are black or red, or pink text on a blue background. However, the color of text they will not respond to unless motivated to do so is - you guessed it - black text on a white background. Just ask them; you likely won't get a consistent answer, but you will be surprised at the foreground background combinations they prefer.

Also, most effective for their style of learning is not text-based homework, but rather experiences that repeat what was learned. Not at home, but during the school day at specific timed intervals 90-120 minutes after the initial learning occurred. Despite what we know, our schools are currently designed so that most real learning has to occur at home where students are forced to relearn things from scratch. These findings hold many implications for developing strategies to help students become highly effective readers. Digital bombardment is clearly affecting the way the digital generation thinks, views the world, how they learn and what engages them.

Proof In Comparison

We now get into the actual comparison between digital learners' learning preferences and our traditional TTWWADI-based teaching style (That's The Way We've Always Done It) still used in classrooms today.

Digital learners prefer to access information quickly from multiple-media sources...

...many educators prefer slow and controlled release of info from limited sources.

Digital learners prefer parallel processing and multitasking...

...many educators prefer linear processing and single or limited multitasking.

Digital learners prefer processing pictures, sounds, color and video before text...

...many educators prefer to provide text before picture, sound and video.

Digital learners prefer random access to hyper-linked multimedia info...

...many educators prefer to provide info linearly, logically and sequentially.

Digital learners prefer to network simultaneously with others...

...many educators prefer students to work independently before they network and interact.

Digital learners prefer to learn "just in time"...

...many educators prefer to teach "just in case".

Digital learners prefer instant gratification and immediate rewards...

...many educators prefer deferred gratification and delayed rewards.

Digital learners prefer learning that's relevant, active, instantly useful and fun...

...many educators feel compelled to teach memorization of content in the curriculum guide.

Points That Bear Repeating

Now that we have the basic comparison down, we can go into more detail on the above points.

1. Digital learners prefer to access information quickly from multiple-media sources, but many educators prefer slow and controlled release of info from limited sources.

Digital learners operate at "twitch speed" due to exposure to cell phones, video games and other hand-held devices. These devices are being limited or banned outright, without even first considering the educational avenues they present. These all reflect aspects of comfort in a digital fast-paced world. Many teachers haven't had this experience, so they are only comfortable teaching at conventional speeds. So kids get to school and basically run into a wall. We need to be willing to acknowledge and accept that this preference is part of their everyday lives.

2. Digital learners prefer parallel processing and multitasking, but many educators prefer linear processing and single or limited multitasking.

Digital learners are comfortable doing many things at the same time. Most educators, however, prefer the traditional approach to learning - one thing processed at a time. Multitasking is technically "continuous partial attention". We randomly toggle between tasks while deciding which one to do next. With the digital generation, it happens much faster. Walk into a kid's bedroom today, and what do you see? They're working on the computer, listening to the iPod, burning a CD, doing homework, watching a movie and carrying on several conversations on Skype and MySpace - all at the same time - and they're still bored.

3. Digital learners prefer processing pictures, sounds, color and video before text, but many educators prefer to provide text before picture, sound and video.

Digital learners prefer pictures, sound, color and video. Most educators provide text before delving into these mediums. For generations graphics were generally static illustrations, photos or diagrams that accompanied the text and provided some kind of clarification. The primary information was provided by text and the images were there to complement the text. The old saying is that a picture is worth a 1000 words – but instead some teachers continue to use 1000 words. For digital learners, the relationship is almost completely reversed. The role of text is to provide more detail to something that is first experienced as an image or a video. To this generation, images and video are powerful enough to communicate the message to them on their own.

4. Digital learners prefer random access to hyper-linked multimedia info, but many educators prefer to provide info linearly, logically and sequentially.

Digital learners prefer random access to hyper-linked multimedia. They are very comfortable roaming between sources in a random non-linear way. Educators, in most cases, prefer the "stand and deliver" method - sequential and straightforward and very left-brain, just like when we grew up. But the digital generation is the first generation in American history to experience hypertext and "clicking around" in computer applications, CDs, DVDs, and now on the Web. This new kind of information access structure has created hyperlinked minds. It has increased their awareness and ability to make connections, and freed them from the traditional paper-based constraints of a single path of thought. This is generally an extremely positive development. However, 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 because they become easily bored. Because the digital generation have hyperlinked minds, their perspective is often "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?" Both traditional and digital learning styles are equally essential because while following one's own path often leads to interesting results, understanding someone else's logic is also very important.

5. Digital learners prefer to network simultaneously with others, but many educators prefer students to work independently before they network and interact.

Digital learners prefer to network with others, but many educators prefer kids to work independently at first. In our school days, we were segregated from one another and very much on our own. After school, we could only communicate either in person or by phone. Today, the digital generation has scores of outlets for communication, all of which they take for granted since they've had them their whole lives. In fact, they expect to be able to interact in this way. We simply cannot deny our kids these opportunities.

6. Digital learners prefer to learn "just in time", but many educators prefer to teach "just in case".

Digital learners are "just in time" learners. Many educators teach "just in case". In the past it was common for someone to spend their entire working lifetime at a single career. Today in this changing economy, having a career for life is very uncommon. The message from companies and employees alike is "if you want loyalty, you should probably buy a dog." Thomas Friedman writes in The World Is Flat that today's students should anticipate having anywhere between 10 to 17 careers by the time they are 35 years old.

It's interesting to note another thing Friedman claims: the top 10 jobs that will be in demand 10 years from now don't exist yet. That requires us to provide students with an entirely different set of skills than the ones they are being given in schools today. But we continue to teach just in case there is an exam, just in case you might need this to pass the course, just in case you might want to become a doctor or an engineer. Digital learners need to learn just in time to play the piano, just in time to solve a new puzzle, just in time to do something they didn't know how to do before. This is the learning that allows them to have the skills, knowledge and habits of mind they need to adapt as that next window of opportunity opens to them.

7. Digital learners prefer instant gratification and immediate rewards, but many educators prefer deferred gratification and delayed rewards.

Digital learners want instant gratification and immediate reward. Many educators will defer such reward until a later time. The message they send is that if you study hard and stay focused, you will eventually be rewarded with a good grade, a better school, or a great job. See why digital culture resonates so strongly with the new generation? It provides them with exactly what they want exactly when they want it. Just like we did at their age, the digital generation wants constant affirmation, lots of attention and the desire to distinguish themselves. Cell phones, social networking tools, digital technology and video games tell the user that IF they put in the hours and master the game or the tool they will be rewarded with the next level, with a win, with a place on the high scorers' list, or a skill that is respected by their peers. What they do determines exactly what they get, and what they get is obviously worth the hours and hours of effort they put in. Video games are intentionally designed to not only coerce the player into making constant split-second decisions, but to reward those choices at regular timed intervals - usually every 7 to 10 seconds of gameplay. This is preferable to the alleged frequency that reward is given in the classroom, in which a student is only given the opportunity to ask a question or make a personal decision once every 25 minutes.

8. Digital learners prefer learning that's relevant, active, instantly useful and fun, but many educators feel compelled to teach memorization of the content in the curriculum guide.

Digital learners want learning that is relevant, useful and fun. The problem is that many educators prefer to follow the curriculum guides alone, and prepare students solely for standardized testing. This approach does not necessarily cultivate the higher-order thinking skills. It does not cater to the essential 21st Century fluency skills our children will need once they leave school. Even though they are often accused of being intellectual slackers, the digital generation are in reality an intellectual and highly motivated problem-solving group. Many types of logic,

challenging puzzles, spatial relationships, and other complex thinking tasks are built into the computer and video games they enjoy. Well below our personal radar, they have highly developed critical thinking and social skills - they're just not the skills that we value nor the skills that we test for in schools. More than anything, they want the answers to these questions: Why am I learning this? What possible connection does this have to me and to my world?

The research says that most teachers overstuff their students, relating far too much information all at once without providing enough time so the students can connect the dots. What the research tells us is that for learning to be relevant to these students, the content must have a context. The tools have to be used to perform a real-life task, and the end product of learning has to be folded into a process. Even more than anything else, learning has to be *fun*. Digital learners just don't understand why learning can't be fun more of the time. What a radical concept - learning being fun, like it was in kindergarten.

So Now We Know

This is the new generation; the digital generation. On the outside they look just like everyone else. But on the inside, neurologically speaking, the similarities end. They're fundamentally different, neurologically different, they think differently and they process information differently using different parts of the brain than people of our generations.

It is truly sad that none of this valuable knowledge we have gained about the way the digital mind functions and learns is being applied to classroom instruction today. Even though we continue to educate in the same manner that we have for nearly the last 100 years, we expect, want and need completely different results. Educators are constantly complaining that kids can't concentrate or memorize content like state and capital names. Meanwhile, that exact same student is thinking "why do I need to spend hours in a classroom learning this when I can Google it on an iPhone in under 5 seconds?"

They're not disabled, they're just "other abled". They're just not interested in and have no patience for old ways. Anyone who knows anything about teaching and learning knows that the secret to success in the classroom has far less to do with being a good disciplinarian or classroom manager, and everything to do with creating an engaging and motivating methodology where the student

feels safe, understood and connected. It's not just about getting them to learn, it's about getting them to *want* to learn. Without motivation there is no learning.

The digital generation are experiencing a world that is increasingly - some would say completely - out of synch with our traditional instructional approach. Today education continues to operate on assumptions about teaching, learning and assessment that are targeted at students from another age. Current brain research tells us categorically that there is no greater anti-brain environment than the way that teaching, learning and assessment currently take place. We continue to try fitting square-peg students into round-hole schools.

Standardized testing will not accurately measure a non-standardized brain. Every child and every brain learns differently, just as everybody develops differently - a fact that the current school system ignores. It's ridiculous to continue to embrace standardized learning and standardized tests at the very same time the new economy is eliminating standardized jobs. If there's one certainty about what today's school children will be doing a decade or two from now, it's that they won't all be doing the same things, and they certainly won't be drawing on the same body of knowledge. That's why education has to change.

Let's be clear about one thing. There absolutely is a place for traditional teaching and learning and assessment. There is always a place for basic skills. That's how you transmit culture and democracy from one generation to the next. We have every right to expect our students to respect and honor our traditions...but the world has changed. Literacy is no longer enough. Having said all this it's important that, ultimately, we strive for a balance between their world and ours.

Every generation since the time of Socrates and Plato including our parents, has looked at the next generation, including us, and said "what's wrong with those kids?" There's nothing wrong! The digital generation is different and they engage with the world differently. We must begin to rethink and re-shape the current classroom learning experience. We need to overhaul the way we teach, the way students learn and particularly the way we assess that learning. We are already 10 years into the 21st Century and we are still debating exactly what 21st Century skills even are. In an era of continuous and disruptive change we in education have not yet become able to respond to the turbulence - what's wrong with that picture?

We need to acknowledge that this generation is different, and begin to address the digital learning styles and learning preferences of the digital generation. We must do this by shaping learning to the students rather shaping the students to the learning as we do now. Otherwise, we run the risk of losing them. How many important things are going on in our classrooms and with our students that we're missing because we are focused elsewhere, such as on standards testing and meeting the requirements of the NCLB? What are we missing that we ought to be looking for?

In 1513, Niccolo Machiavelli wrote this:

> *There is nothing more difficult to take in hand, more perilous to conduct, or more uncertain in its success, than to take the lead in the introduction of a new order of things, because the innovator has for enemies all those who have done well under the old conditions, and lukewarm defenders in those who may do well under the new.*

But perhaps Jim Crupi, founder and president of Strategic Leadership Solutions, also has a point when he tells us this:

> *Lead, follow, or get the hell out of the way.*

We all understand that there is a need for change. But when things get challenging, we all have a tendency to go back to what we're comfortable with. As the old saying goes, when the going gets tough the tough get traditional. At an unconscious level we absolutely revert back to our comfort zones. How do we in education step out of this mindset, and prepare ourselves to move forward into a world that we may not understand, but must try to if we ever hope to prepare our children for life beyond the classroom? Perhaps you can start by asking yourself 3 critical questions:

1. What are 3 things you know now that you didn't know before?

2. What 2 things are you going to tell your family and friends about?

3. What action are you going to start taking *right now?*

Don't let your TTWWADI hold you down, because change is happening now! Once you take that action, you set events in motion. You take the first of many steps toward understanding, and connecting with, our new digital generation. You now know what's going on, and you have a glimpse of "living on the future's edge". The digital learners are leading the way...and it's time for us to catch up!

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21st Century Fluency Project

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