

Reinventing Learning for the Always-on Generation

Strategies and Apps That Work

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Introduction

Educators today face the challenge of teaching learners who have never known a world without laptops, tablets, smartphones, or the internet. Learners who take for granted growing up in a world that is seamlessly connected by powerful information and communication technologies that give them instant access to everyone and everything, anytime, and anywhere.

Digital games, YouTube videos, texts, tweets, Instagram messages, SnapChat posts, and all of the other elements of the always-on generation's digital diet have created a landscape of experiences that are constantly wiring and rewiring their neural structures of their brains. Researchers such as Judy Willis and David Sousa (2014), Bryan Kolb (1998), Norman Doidge (2007), Gary Small (2008), and John Medina (2008) have separately concluded that neuroplasticity, the ongoing process of reorganization and restructuring of the brain, is not a myth. The constant bombardment of information in the new digital landscape has become the catalyst for the emergence of a different kind of student.

Chronic digital bombardment has transformed our learners into digital learners. And because of this transformation, the digital generations have developed new preferences for learning. Jukes, Schaaf, and Mohan (2015) identified nine key learning attributes of the digital generations. It's important to point out that the attributes don't apply equally to every learner in every location. There are a wide range of behaviors that are affected by factors such as culture, socio-economics, geography, and personal experiences.

1. Digital learners prefer receiving information from multiple, hyperlinked digital sources.

In the past, the traditional approach in the classroom was for educators to slowly release information in the form of classroom lectures, discussions, worksheets, or textbooks. Nowadays, learners can ask digital assistants like Siri for simple answers that learners of previous generations needed to memorize or look up in a dictionary or encyclopedia. In an age of hyper-information, having an iron-clad memory is not always necessary to be successful. What is essential for digital learners is the ability to sift through and critically analyze all of the data scattered across the digital landscape to discover the information they are searching for. In many instances, the resources at their disposal in their homes or pockets are more powerful than the resources that are available to them in their classrooms. Digital learners today have access to the greatest collection of information in human history—the internet. Learners can instantly access more than one trillion hyperlinked web pages, and use them to construct personal knowledge. However, to effectively use the power of the internet, learners and teachers alike must be able to distinguish between information, misinformation, mythinformation, and “fake news” amongst online sources.



2. Digital learners prefer parallel processing and multitasking.

Many parents have had the experience of walking into the rooms of their children, their friend's children, and those of their nieces and nephews. There they are- using a tablet or computer - earbuds draped around their neck - blasting music from Pandora or their own digital library - their hands playing imaginary riffs to the guitar solo. Meanwhile, they're also doing their homework, watching a YouTube video, sending a SnapChat message, downloading music or an image from Google, and searching Amazon, while simultaneously carrying on two conversations - one on Instagram with a person they've never met - while at the same time texting their best friend about last night's party. Another screen holds a game of Angry Birds that has been momentarily paused. For many members of previous generations, this scenario resonates as being utterly overwhelming. There's just too much going on at once! The amazing thing is, if you ask the kids, many of them will tell you they're still bored.

In his book *Brain Rules*, author John Medina (2008) states that research on multitasking indicates that contrary to what the digital generations might believe, multitasking modern learners are not nearly as effective at concentrating on a particular task as those who single task. In fact, Medina suggests that humans are biologically incapable of processing multiple, information-rich inputs simultaneously. The behavior the digital generations are engaging in is known as continuous partial attention—where they randomly switch between tasks, deciding which one to do next, and time-slice their attention into short intervals. Although the digital generations can't engage simultaneously in multiple cognitively demanding tasks, they can perform everyday tasks they're familiar with, or that aren't cognitively demanding. The older generations consistently engage in continuous partial attention - they're driving their cars, listening to the radio, thinking about a problem at work, reading a billboard, and discussing where they want to go for dinner with the passengers.

The digital generations use their digital devices to augment their thinking skills. Lower order thinking is being replaced by search results and instantaneous access to information. As a result, digital devices are quickly replacing selective parts of our memory, while at the same time freeing up cognitive capacity to address higher order thinking tasks.

3. Digital learners prefer processing pictures, sounds, color, and video *before* they process text.

Traditionally, pictures were present in texts as a supplement to the intended message. However, due in large parts to advances in, and the prevalence of digital technologies and media, the digital generations have grown up in a remarkably visual world. Images have the ability to communicate meaning quickly. Burmark states (2002) that the eye processes images 60,000 times faster than it processes the content of text. From an early age, the digital generations have been regularly exposed to television, computers, tablets, videos, and digital games that put colorful, highly expressive, high-



quality, realistic, multi-sensory experiences such as sight, sound, and touch - and in the near future smell, taste, and 3D - that contain little if any text. As a result, many of the digital generations prefer to process pictures, sounds, color, and video before they process text. It's a natural conclusion that they prefer their media in the same way they use it at home.

4. Digital learners prefer to network and collaborate simultaneously with many others.

In the past, traditional educational practice has been to initially have learners work independently, before exploring what they had learned with their classmates. In fact, outlets of communication were not as prevalent as they are today. Outside of school, communications with their friends was generally limited to conversations that were either made in person or by phone. However, today, children have grown up with literally hundreds of ways to communicate with one another. The new digital landscape allows the younger generations to connect anytime, anywhere with anyone using digital tools to communicate.

The digital generations are highly social - although not in the same way that the older generations are. They use computers, laptops, tablets, smartphones, Bluetooth, Wi-Fi, video mashups, Instagram, Snapchat, Skype, Facebook, texting, tweeting, social networking, and hundreds of other tools to collaborate and learn independently or from one another. Based on current trends, being able to transparently communicate and work with others in both virtual and face-to-face teams is becoming an increasingly critical skill.

5. Digital readers unconsciously read text on a page or screen in an F or Fast-pattern.

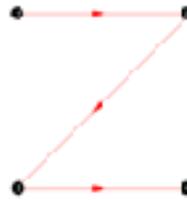
As a result of digital bombardment and the chronic urge to rapidly skim, scan, and scour through digital resources, a 'new' reading pattern has emerged for the always-on generations. Before the proliferation of digital screens and web-based content, traditional book readers engaged in a reading pattern similar to the letter 'Z.' Traditional readers would start their reading experience at the top left of a page. Then the reader's eyes would read to the right until it reached the end of the text line. Next, the reader's eyes would move diagonally down to the next line and repeat the reading pattern from left to right.

Today, as a result of constant exposure to digital reading formats, reading also involves viewing the layouts of things such as social media pages, websites, tablets, smartphone screens, ebooks, and video games. New research has emerged that demonstrates that digital readers don't read pages the way older generations do. Instead, their eyes first skim the bottom of the page, then scan the edges of the page, before they start scanning the page itself for information in what's called an F or fast pattern.

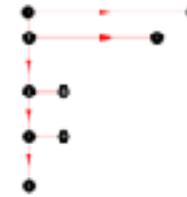


The reading behavior occurs as follows:

1. Users read in a horizontal movement, usually across the upper part of the content area. This initial element forms the F's top bar.
2. Next, users move down the page slightly and read across in a second horizontal movement that typically covers a shorter area than the previous movement. This additional element forms the F's lower bar.
3. Finally, users scan the left side of the content in a vertical movement. This last element forms the F's stem.



Z-Pattern



F-Pattern

6. Digital learners prefer “just-in-time” learning.

Traditionally, schools use the “just-in-case” approach in their academic programs. Learners are introduced concepts “just-in-case” they will be on a test, “just-in-case” they are needed for a good grade, or “just-in-case” the concepts and knowledge are eventually needed when they grow up. However, as mentioned earlier, the world has fundamentally changed, and continues to change even more each day. The global economy has created a new division of labor that rewards people who can make swift, well-informed decisions utilizing multiple information sources. At the same time, it penalizes those who lack the modern-day skills needed for the new workforce and workplace. As a consequence, learners are entering a working world where they need to be continuously upgrading their skills just to stay current - let alone move ahead in - their careers. The digital generations must prepare for a life of constant learning, unlearning, and relearning if their skills are to stay relevant in emerging work environments.

To be successful, they must embrace a “just-in-time” mentality - just-in-time to learn a new skill, just-in-time to accomplish a new task, just-in-time to solve a real-world problem, just-in-time for a new job, or just-in-time to fulfill a new passion.

7. Digital learners are looking for instant gratification and immediate rewards, as well as simultaneously deferred gratification and delayed rewards.

Digital learners have grown up in a world with access to the new digital landscape and the tools needed to navigate it once they get there. One of the most influential factors that keep them coming back for more is the constant feedback they receive from their digital habits. Digital tools provide instant and ongoing feedback to their users. As the digital generations dive into their virtual environments, they receive feedback and gain immense and immediate gratification for their efforts. Why do they keep coming back?

The answer is simultaneously complex, yet easily observable. If an aspiring photographer adds a photo to Instagram and immediately receives 50 likes from followers, then they are receiving both immediate feedback and instant gratification. If a young man shares a tweet on Twitter that is favorited and retweeted a dozen times by friends and strangers alike, they receive immediate feedback and instant gratification. If a young lady posts a video onto YouTube and it receives 75,000 views and hundreds of likes, then she receives immediate feedback and instant gratification. If a young gamer reaches Level 100 in their favorite video game, they receive immediate feedback and instant gratification.

And while these digital milestones provide immediate feedback to the digital generations, they also simultaneously provide deferred gratification and delayed rewards. Let's consider the previous examples through a less immediate lens. The aspiring photographer puts in the time to take the perfect photo. They may have taken hundreds of shots before settling on the best picture to share with their Instagram followers. The young man sharing his ideas on Twitter has to understand his audience and the type of content they want to read and tweet with others. HE may be sharing a passionate blog post, an essay on tectonic plates, or a drawing that took hours to complete. The young lady had to carefully plan, record, and edit her video to make it appealing to the millions of media-hungry viewers searching YouTube for entertaining or informative content. Finally, the young gamer may have spent hundreds of hours to develop their video game skills and experiences to achieve a milestone coveted by players of a lesser rank. All of these examples are powerful representations of deferred gratification and delayed rewards.

Things like smart phones, video games, and social media tools all tell the children of the digital age that if they put in the time, and if they master the game or tool, they'll be rewarded with the next level, a win, a place on the leaderboard, or a skill that's respected and valued by their peers. What they put into a task determines what they get out of it; and what they accomplish or discover is clearly worth the hundreds, if not thousands of hours of effort they put into developing these skills. But at the





same time, video games and digital technologies give kids immediate feedback for their efforts, and quench their constant thirst for instant gratification.

8. Many of the digital generations are transfluent. Their visual-spatial skills are so highly evolved that they have cultivated a complete physical interface between digital and real worlds.

Due to the constant use of digital tools and regular immersion into the digital landscape, the always-on generations live a hybrid existence - one part constructed from real-world experiences - and the other part, in a virtual environment. The older generations may develop a digital presence, but many of them continue to see the real world and the digital landscape as two separate environments. "On the other hand, many members of the digital generations are transfluent—their visual-spatial skills are so highly evolved that they appear to have cultivated a complete physical interface between their digital and real worlds." (Jukes, Schaaf, & Mohan, 2015, p.121) Their digital existence is just as relevant and impactful as their existence in the real world. Consequently, the digital generations have difficulty separating real from digital experiences. That's why cyberbullying has such a powerful effect. For them, text, images, or video viewed on a screen have the potential to cause equally as much psychological damage to the victims as real world events can.

Fortunately, there are also many positive forms of digital interaction that are experienced by the younger generations. For example, they conduct multiple discussions with friends and family members using virtual environments (often simultaneously) and regularly participate in activities related to scholarly or personal research, social activism, altruism, or crowdsourcing.

Although the digital generations covet their smartphones and tablets, they don't think about them because they have become transparent. They have outsourced parts of their brain to their smartphone. The devices are just a means to an end, not an end in itself. The digital generations use their tools to create seamless, transparent gateways between real and virtual worlds. They create unique and useful solutions to real-world problems by transforming raw information into new knowledge that they can connect to existing knowledge, which is the definition of transfluency.

9. Digital learners prefer learning that is simultaneously relevant, active, instantly useful, and fun.

As educators, we must ask ourselves some critical questions. Will our learners remember performing the play, *The Odyssey*, for the student body? Will they remember the campaign undertaken to clean a local reservoir that has been fouled with pollution? Will they remember the Skype interview conducted with an astronaut from NASA, or a Pulitzer Prize winning author, or a local politician explaining some of the important issues their town is currently facing? OR Will they remember the countless hours of worksheets and homework assigned as busy work? Will they remember the endless



days of standardized tests they had endured before they graduated? Will they remember the content of the hundreds of stand-and-deliver lectures they received during their time in school? How many school teachers have ever been told by a former student that a standardized test changed their life?

Digital learners prefer learning that is simultaneously relevant, engaging, active, instantly useful, and fun. Outside of school, learners are constantly connected to others in a global intelligence. They are immersed in virtual environments that promote a participatory culture that encourages them to not only interact with their friends and classmates, but also with other in from far-off places. However, in many classrooms today, learners continue to be unplugged. As a result, the digital generations can become easily resentful and disengaged, because many of them have a digital life outside of school, while they have a non-digital life in school.

Beyond the classroom, members of the digital generations have a large measure of control. They pick what video games to play, what blog posts to read or write, what causes to advocate for, what videos to like, which friends to text, what music to listen to, or what passion project to embrace. However, in schools, many of the digital generations have little sense of, or opportunity for, ownership of their life or learning. They lack the choices as to what books to read, what instructional tools to use, what products to create, or how to learn new information.

Closing

Anyone who has felt the passion of teaching can tell you that the secret to success in the classroom has very little to do with being a good disciplinarian, classroom manager, or content dispenser - and everything to do with creating engaging teaching methodologies that compel learners to *want* to be there. It's not about *making* learners learn. It's about getting them to *want* to learn. If learners have no motivation to learn, there will be no learning. As an educator, ask yourself this question - would learners choose to be in your classroom if they didn't have to be there?

The most powerful technology in the classroom - the killer app for modern learning - is a passionate teacher with a love of learning, an appreciation for the aesthetic, the esoteric, the ethical, and the moral. A teacher who transforms their classroom into a nexus of knowledge, creativity, and innovation.



Digital Libraries

We have collected resources aligned to each of the learning attributes and curated them into individual digital libraries.

Chapter 1: Standards: The Common Core & Beyond

<http://bit.ly/reinventinglearningc1>

Chapter 2: What's Wrong With Kids Today?

<http://bit.ly/reinventinglearningc2>

Chapter 3: Kids Today Are Different

<http://bit.ly/reinventinglearningc3>

Chapter 4: A Need for Speed

<http://bit.ly/reinventinglearningc4>

Chapter 5: Multitasking Mind

<http://bit.ly/reinventinglearningc5>

Chapter 6: EyeWorld

<http://bit.ly/reinventinglearningc6>

Chapter 7: Everyone Is Connected To Everyone & Everything

<http://bit.ly/reinventinglearningc7>

Chapter 8: Fast Pattern Reading

<http://bit.ly/reinventinglearningc8>

Chapter 9: Just in Case versus Just in Time

<http://bit.ly/reinventinglearningc9>

Chapter 10: Instant vs Deferred Gratification

<http://bit.ly/reinventinglearningc10>



Chapter 11: Transfluency
<http://bit.ly/reinventinglearningc11>

Chapter 12: Learning Must Be Fun
<http://bit.ly/reinventinglearningc12>

Chapter 13: Time For A Change
<http://bit.ly/reinventinglearningc13>

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This resource is the collaborative effort of a group of experienced educators and entrepreneurs who have united to share their experience and ideas and to create a project geared toward making learning relevant to life in our new digital age. Our purpose is to develop exceptional resources to assist in transforming learning to be relevant to life in the 21st century. For more information, please visit our web site www.infosavvy21.com.

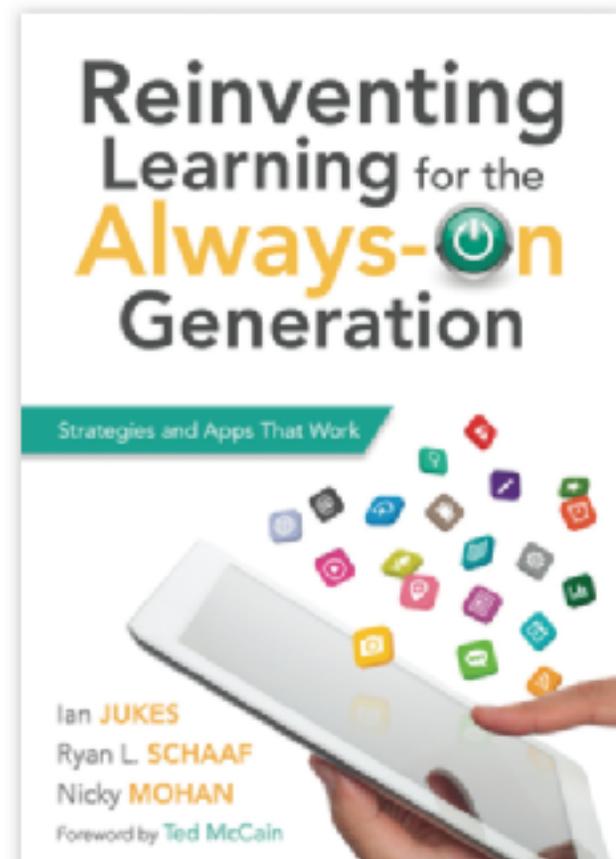
This handout was updated by Ian Jukes, Ryan Schaaf, and Nicky Mohan in November 2017.



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Cultivate effective 21st century classrooms. Teachers and administrators must respond to the digital bombardment students face to ensure their success in the 21st century world. Explore the differences in students' neurological processing from previous generations, investigate the nine critical attributes of digital learners, and discover practical strategies for making learning relevant, engaging, and fun through digital activities.

Benefits

- Understand how the digital generation's exposure to technology is rewiring their brains and the challenge this rewiring creates for educators.
- Identify learning attributes unique to 21st century students, and gain strategies to support each attribute.
- Recognize the strengths and weaknesses of different digital tools, and learn to use each in teaching, learning, and assessing.
- Learn why the digital generation must be engaged and taught differently than previous generations to ensure learning.
- Select the traditional teaching practices that can be integrated with digital technology to best educate students.

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