

**Prensky's Digital Natives Versus Digital Immigrants:  
Urban Legend, Fact, or Fiction?**

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**Abstract**

Education, learning, and technology combined with a new generation of students called *digital natives* are on a collision course with instructors called *digital immigrants*. The collision has created a learning gap between digital natives and digital immigrants. The learning gap is based on the differences between students, parents, teachers, and school administrations and what each group knows, thinks, and expects when using technology to learn. This paper documents evidence of the learning gap between digital natives and digital immigrants. This evidence is based on studies about the interactions between the digital natives and digital immigrants (students, teachers and administrators) and their relationship to technology. To reduce the learning gap, teachers and school administrators must take a leadership role. Digital immigrants are now tasked with engaging digital natives in the learning process. Instructors need to understand generational, pedagogical, and technological needs. Class curricula require good instructional plans that promote pedagogical practices involving interactive inquiry or problem-based, technology-enriched teaching and learning. Teachers need to accept and embrace change and school administrators need to support faculty development. Digital natives and digital immigrants must work at better communications to help reduce the learning gap.

## **Prensky's Digital Natives Versus Digital Immigrants:**

### **Urban Legend, Fact, or Fiction?**

There seems to be an ever-widening learning gap these days between how teachers approach instructing students, how students learn, and how students prefer to learn.

Parents, students, faculty, and school administrators continue to view and experience technology very differently and this continues to widen the learning gap (“The New Media Consortium”, 2008). Marc Prensky is the author of many articles and books about gaming and how students learn as well as a proponent of changing how teachers instruct. Prensky (2001a) states, “today’s students are no longer the people our educational system was designed to teach” (p. 1).

This new generation of students is known by a few different names such as the Net Generation (Oblinger, Oblinger, 2005, p. 1.2), Millennials (Taylor 2007), and Digital Natives (Prensky, 2001a, p. 1). In the context of digital natives, there are also digital immigrants. The digital immigrants are a mix of teachers and older students. Prensky (2001a) discusses technology-related reasons as the difference between digital natives and digital immigrants. He says:

Today’s students – K through college – represent the first generations to grow up with this new technology. They have spent their entire lives surrounded by and using computers, videogames, digital music players, video cams, cell phones, and all the other toys and tools of the digital age. Today’s average college grads have spent less than 5,000 hours of their lives reading, but over 10,000 hours playing video games (not to mention 20,000 hours watching TV). Computer games, email, the Internet, cell phones and instant messaging are integral parts of their lives. (p. 1)

Elements of the learning gap (small and large) are attributed to student and parent expectations, school administration and policy guidelines, instructors' technological prowess (or lack of it), and how teachers see their role when instructing digital natives (Kim Farris-Berg 2005). Prensky (2001a) goes on to say "The single biggest problem facing education today is that our digital immigrant instructors, who speak an outdated language (that of the pre-digital age), are struggling to teach a population that speaks an entirely new language, (p. 2). This paper examines the argument that there is a learning gap between digital natives and digital immigrants, the reasons for it, and how to reduce it if this gap exists.

#### Elements of the Learning Gap

The learning gap cited in this paper is defined by the differences between what a student actually knows, thinks, and expects versus what the instructors (or school systems) know, think, expect, and teach and also what parents think and expect. Authors Levin and Arafeh (2002) of "The Digital Disconnect: The Widening Gap Between Internet Savvy Students and Their School" list many elements that cause the learning gap. Here seven of the many examples. (1) There is a wide variation in teacher policies about how the Internet is used by students in class and for class projects outside of class. (2) Schools and teachers have not yet recognized and have not responded to new ways to that students can learn and do research over the Internet. (3) Schools and teachers do not use technology in teaching. (4) It is the administrators, and not the instructors, who set the tone for Internet use at school. (5) Instructors do not competently use technology to engage students. (6) Some students and teachers don't have computer skills and need help

to update those skills. (7) Students think that professional development and technical assistance for teachers are crucial for effective integration of the Internet into curricula.

Another important example of research that illustrates the learning gap is from the Net Day Speak Up projects (from 2003 to 2008). All of these reports and studies not only offer evidence about the learning gap, but they provide insight into student trends, student learning activities, and how students, teachers, parents, and school administrators have been changing over the course of five years (2003 to 2008). These reports also show how the learning gap fluctuates. In some cases, the gap is reduced in one area because of conscious efforts and widened in other areas as technology evolves and other factors change. (McGee, Dias, 2007).

#### Understanding Generational Differences for Effective Teaching

To grasp the implications of overcoming the learning gap, a generational timeline, with comments about the three generations involved, needs to be discussed. This timeline provides a snapshot of who is involved with today's teaching and learning. The timeline also provides insight into how digital natives and digital immigrants approach learning and their generational traits.

**Baby Boomers: 1943-1960.** This generation was shaped by the cold war, the hippy movement, social awareness, the drug culture, Vietnam, TV, the Kennedy and King assassinations, the Beatles, Rock N Roll, Johnson's Great Society, landing on the moon, Woodstock, Nixon, WaterGate, and Kent State (Taylor, 2007).

**Generation X: 1961-1981.** This generation was shaped by their parents, the Baby Boomers. Gen Xers thinking has significant overtones of cynicism against things held dear to the previous generation (the Boomers). In Gen Xers' lifetime, the Cold War ended

and Ronald Reagan was president; these two factors created a preoccupation with all the problems of the preceding generations and its those influences. There are fewer Gen Xers so they are termed the *baby busters*. Gen Xers feel influenced and changed by the social problems they see as their inheritance: racial strife, homelessness, AIDS, fractured families, and federal deficits (Taylor, 2007).

Millennials: 1982- 2003. Millennials are the children of late baby boomers and early Generation Xers. They grew up with “Babies on Board” signs in cars during the early Reagan years (1980s) as well as with signs “Have You Hugged Your Child Today” that were a sign of the early Clinton years (1990s). Millennials feel like they are a generation of “wanted” children and that they are central to their parents’ sense of purpose. Many Boomer parents delayed having children until they were financially secure. Boomer parents tend to be over-protective, but Millennials are confident because they have parents believing in the importance of self-esteem raising them. Millennials are optimistic yet practical. They want their parents involved (really involved) and they accept authority. Their “growing up messages” were: “Be smart – you are special” and “leave no one behind.” They are taught to be inclusive and tolerant of other religions and sexual orientations (Taylor, 2007).

Being connected 24/7 has taught the Millennials to be interdependent on family, friends, and teachers. A common theme is to achieve now, with the idea of getting into the right college or the right preschool as well as think of the greater good, invoking the call to serve your community. Millennials are used to being organized in teams and have spent much of their time working and learning in groups (Taylor, 2007). They believe it is cool to be smart (Oblinger, Oblinger, 2005). Millennials are achievers who are very

much into setting and meeting goals. Pressured by parents, teachers and peer competition, Millennials study hard wanting to succeed in college and in careers that “pay off” nicely. (Taylor, 2007).

### Digital Natives and Education

Many observations can be made about the Net Generation (as Oblinger calls Millennials). These observations merit special mentions because of the potential impact on higher education (p. 2.4). Digital immigrants and instructors need to be aware that Millennials have preferred learning styles that include using technology and multitasking. Millennials don't think of technology as optional, but rather a way of life. For them, the availability and use of technology is a given (p. 3.6). Millennials believe that information must be individually tailored to them and that technology is available to use. However, they understand that using technology is not a learning substitute. It is critical that information is portable and that any type of content must be dynamically generated. ‘Lag Time’ is a foreign concept to them (Taylor, 2007). College students gravitate to group learning activities and are fascinated by new technology. Using technology, is not just about having the technology, they think in terms of activities that technology enables. (Oblinger, Oblinger, 2005, p. 2.10).

Millennials work in teams and learning is participatory. They like experimental learning that involves interactions with others (Oblinger, Oblinger, 2005, p. 2.13). Millennials like and learn from games (Prensky, 2001a, p. 1). Trial and error is a key learning strategy (Nintendo logic) and Millennials are used to bits and bytes as well as flash and color. They have zero tolerance for delays and are “rule followers.” But (we) must give them clear rules they can understand (Taylor, 2007). They have the “ability to

read visual images—they are intuitive visual communicators.” With “visual-spatial skills—perhaps because of their expertise with games, they can integrate the virtual and physical.” Millennials prefer “inductive discovery—they learn better through discovery than by being told.” “Operating with Attentional Deployment, they are able to shift their attention rapidly from one task to another” and they may choose not to pay attention to things that don’t interest them, “and they have fast response time—they are able to respond quickly and expect rapid responses in return” (Oblinger, Oblinger, 2005, p 2.5).

### Prensky and the Brain

The premise about digital natives proposed by Prensky is that the digital natives have grown up with technology and have a better understanding of it because that is all they have known their whole life. No matter how comfortable digital immigrants are with technology, they did not learn it first. However, other researchers and writers such as Oblinger and Oblinger point out that while the net generation was “exposed to IT beginning at a very young age,” other generations can adapt to the use of technology in the context of learning (p. 2.2). Prensky (2001b) goes on to suggest that because digital natives have known only how to use digital technology that they have a different thought process from other generations (p. 1). Prensky (2001a) in the article: “Digital Natives, Digital Immigrants – A New Way To Look At Ourselves and Our Kids” goes on to claim that there are other reasons for a difference between digital natives and digital immigrants.

One reason is that digital natives’ brains work differently than digital immigrants’ and that this impacts how digital natives think and learn related to technology. It is now clear that as a result of this ubiquitous environment and the sheer volume of their interaction with it, today’s students think and process information fundamentally differently from

their predecessors. These differences go far further and deeper than most educators suspect or realize. (p. 1)

While teaching methods might need updating to accommodate digital natives, the idea that somehow human brains are wired differently because Millennials are the only generation that has exclusively been exposed to digital technology seems unrealistic. Prensky's references (Caine, Caine, 1991) support his conclusions that the brain changes based on different stimuli. Other sources such as Bruer's, books titled: *The Myth of the First Three Years* (1999) about brain research also verify these claims that the brain changes after birth. And while the brain develops at different rates during various stages of life, the brain can adapt and accept change based on diverse stimuli (that can be good or bad) from social, economic, personal, and environmental factors that impact change and this change can happen to anyone, not just Millennials. (Nelson, C, 1999, p.43).

An interesting point made by Pensky (2001b), who is not a brain researcher, and others who are in the brain research field, is while experiments are done on humans and other animals, no one really knows if any of this is true about the brain (p. 2). Brain researchers do have different forms of evidence about the brain and how it works. However, it is impossible to say (with a 100% accuracy) that the brain works exactly one way. Other factors that influence the thought process of digital natives are games. Prensky has written extensively about this in books such as: *Don't Bother Me Mom--I'm Learning!* (2006) and in articles such as "Why Games Engage Us." (2001). However, according to Prensky (2001b) he states:

We often hear from teachers about increasing problems their students have with reading and thinking....One key area that appears to have been affected is *reflection*. Reflection is what enables us, according to many theorists, to generalize, as we create "mental models" from our experience.... In our twitch-speed world, there is less and less time and

opportunity for reflection, and this development concerns many people. One of the most interesting challenges and opportunities in teaching Digital Natives is to figure out and invent ways to *include* reflection and critical thinking in the learning (either built into the instruction or through a process of instructor-led debriefing) *but still do it in the Digital Native language* (p. 5).

#### Digital Natives Learning Styles Versus The Role of Digital Immigrants

Do Millennial students or digital natives learn differently than the generations preceding them? Yes, they do! But not because they were born with their brains in tune with digital technology. The Net Generation have distinct behavioral traits from being comfortable using and learning with technology. And while, they understand that using technology is a way of life, they know it is not a learning substitute. Millennials think in terms of the activities that technology enables. They like to be engaged intellectually with activities such as games, working in teams where everyone participates, using trial and error experiments as important learning strategies and they like to follow the clear cut and understood rules. A shortcoming of Millennials is not reflecting after learning takes place.

These traits are due to generational influences such as their upbringing and the way that technology evolved during the time Millennials were growing up. This learning behavior is not uncommon between students, parents, teachers and school administrations of different generations. In the struggle between generations, digital immigrants need to take a leadership role to address the generational learning gap. Digital immigrants who are tasked to teach digital natives need to learn how to speak their language.

What about digital immigrant behavior? Moore, Fowler and Watson (2007), the authors of “Active Learning and Technology: Designing Change for Faculty, Students, and Institutions”, state, “however much the public rhetoric champions transformative

change—the kind of organizational learning that signals a marked shift in the way colleges and universities behave—the reality is that most mature organizations and the individuals they employ resist change” (p. 1).

One suggested solution to help digital immigrants reduce resistance is to lower the digital immigrant’s learning anxiety. The digital immigrants need to accept that change is necessary to learn new practical skills. Tactics, such as training and coaching, along with incentive programs, are necessary to facilitate change and encourage progress (Moore, et al. 2007, p. 43).

Digital immigrants need to understand how to work effectively with digital natives. For example, “Digital natives are used to receiving information really fast.” This is referred to as *twitch speed* (Prensky, 2001a, p. 2). Digital immigrants don’t understand twitch speed skills that digital natives have developed. When a digital immigrant comes to teach a class, he or she assumes that students learn the way they always have and that tried-and-true teaching methods will work. Prensky (2001a) states, “that assumption is no longer valid” (p. 3).

#### Digital Immigrants Delivery Skills Need To Change

Change agents are necessary for developing and maintaining new skills for “fluency with information technology in higher education.” To have successful change related to using technology, three knowledge and skill-development areas must be acquired. The first is learning day-to-day skills such as how to navigate a computers operating system or working with word-processing applications. Second is to understand the advantages and disadvantages of when to use various electronic media to achieve stated aims. Third is to develop knowledge and skills to improve intellectual capabilities

that support high-level problem solving, critical thinking, and clear communication when working in information-technology-enabled environments. All of these skills require practice. Faculty members need to develop knowledge of technology-based processes. Six best practices describe activities that faculty should participate in, learn, and ultimately use to change their teaching behaviors, They include: “(1) manage institutional issues; (2) implement adult learning practices; (3) offer incentives to participate; (4) deliver workshops; (5) utilize colleagues and peers; and (6) provide ongoing support” (Moore, et al., 2007).

Good management practices are necessary to establish an “atmosphere of trust” that provides an environment in which faculty can fail without losing face. Rewards are needed to encourage faculty to take risks and be creative. Open and frank discussions about how technology works enables faculty to see where they are stand in relationship to using technology to develop 21st century skills. (Moore, et al., 2007, p. 46). Skills for the 21st century include: learning and working with Weblogs also known as Blogs, collaborating on and working with Wikis, learning how to work with collaborative social networking websites such as My Space and Flickr, creating and working with Podcasts and being Web aware and savvy. (Richardson, 2005, p. 8).

In a article by Moore et al. (2007) the title heading: *Pedagogy First, Then Technology* is used to describe good teaching practices. This title heading suggests that pedagogical practices need to involve “interactive, inquiry- or problem-based, technology-enriched teaching and learning” (p. 46). This requires teachers to develop pedagogical strategies that require students to be actively engaged in learning and developing “problem-solving and problem-posing skills” in technology-enabled learning

environments. Faculty need to “discover, implement, and assess effective technology-enriched teaching and learning practices (p. 46). Some faculty members have changed their teaching approach simply to get the attention of students. “But reexamining pedagogical practices to curb students’ inattentiveness ought not be the principal aim of change” (McGee, Dias, 2007). The ideas should be to create a better learning environment that engages and challenges students.

### Reducing Learning Gaps

What can be done to reduce the learning gap between instructors and students? Questions that faculty might consider are: “(1) What do achievements in critical thinking, problem-solving, and communication (and in other higher-level capabilities desired across areas of study) look like in technology-enriched environments? (2) What teaching strategies might be used to help students attain the achievements identified?” (Moore et al. 2007 p. 51). Fundamentally instructors need to become fluent in developing technology-based skills. While digital immigrants will rarely catch up with digital natives, the instructors need to have good instructional plans developed that will allow them to engage students with technology (McGee, Dias, 2007). Once students are engaged, an instructor uses content to teach (Taylor, 2007). Digital immigrants need to learn how to capture the learner’s attention by using technologies students are familiar with to deliver the content a teacher want his or her students to know (Taylor, 2007). Instructors also need to know each of their students. Talking with and listening to students to find out what they are interested in is imperative. (Prensky, 2006, p. 139). Finding out what digital natives interests are will help instructors find unique ways to gain the students’ attention and create interactivity. Another suggestion is to teach using

games that the students have interest in. Ideas to gain attention and engage might include: forming a good connection between the learner and the social context in which the learning will take place. For adolescents, making the curriculum and instruction relevant to their experiences, culture, and goals help the students see value in the curriculum. (Oblinger, Oblinger, 2005, p. 10.3).

Instructors need to participate in trend watching such as following NET DAY polls to stay in touch with national trends (Taylor, 2007). Letting students collaborate on a variety of tasks from in-class projects to homework is helpful. One way of supporting more collaboration is to encourage use of mobile technology such as using instant messaging in the context of homework to allow students to work together when they are not at school. Millennials want to learn and like being engaged. While the learning gap may never be closed, the solution is to find a way to engage them (McGee, Dias, 2007).

### Conclusions

The purpose of this research was to examine if a learning gap exists between digital natives and digital immigrants and if there is evidence of a learning gap, then provide feedback for how to reduce it. The answer is yes. There is a learning gap between digital natives and digital immigrants that is related to technology. And this gap appears to be widening.

The causes of the learning gap are related to many factors such as the generation gap between Millennial students and instructors, between students and parents, the profusion of technology, fear of technology by instructors, lack of technological skills, inflexible and poorly managed school systems, and poor communication between students, parents, instructors, and school administrations. Each participant in the learning

process needs to communicate effectively to ensure that students learning needs are met despite any learning gap. This often takes time and patience.

Millennial students are technically savvy, expect technology to be part of the learning equation. They are used to being intellectually engaged with technology. They like working collaboratively and are often part of a social networking system.

Teachers and school administrations need to take a lead role in reducing the learning gap. Good communication between teachers and student is vital. Instructors need to develop an understanding of each generation involved in the learning process then they have to come up with strategies to address generational, pedagogical, and technological needs. Instructors need to develop good instructional plans that promote pedagogical practices that involve interactive, inquiry- or problem-based, technology-enriched teaching and learning. In this process, teachers need to employ tactics that capture the attention of Millennials, Gen Xers, and Baby Boomers to keep them engaged.

Teachers need to accept and embrace change. School administrations need to support faculty during professional development activities to allow them to develop, maintain, and update information technology skills.

Teachers who understand Millennial student needs, participate in professional faculty development, and provide engaging classrooms and learning that use technology will help reduce the learning gap between digital natives and digital immigrants.

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