DIGITAL NATIVES & DIGITAL IMMIGRANTS: EXPLORING THE DIGITAL GAP

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Abstract

Digital Natives & Digital Immigrants: Exploring the Digital Gap

Is there a "digital gap" between students, their teachers and the classroom? Do students "shut down" when they enter the classroom? This research paper surveyed students on their use of digital technology and asked how these technologies could be used to enhance their education. 64% of students surveyed said there are ways that teachers could incorporate additional technology into their learning, and bring technology closer to the classroom. After conducting this research, there are many ways that teachers can implement popular methods of web 2.0, social networking and instant messaging to improve student learning.
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Introduction

It's ten minutes before first period begins and Jane forgot to update her Twitter and Facebook page, not to mention the fact that she needs to text Sally about her potential crush on John. Her procrastination might mean that her friends will not know where she is and how she feels today. Jane is a high school sophomore with one of the most sophisticated mobile phones on the market that she absolutely cannot live without. Her life without constant connection to the technological world of social networking sites and text messaging would be absolutely, positively, horrible!

A recent study by Prensky (2001a) showed that by the age of 21, this generation of children, dubbed several names (Net Generation, Generation Millenial, iGeneration) would have:

- Spent 10,000 hours playing video games
- Sent 200,000 e-mails
- Watched 200,000 hours of television
- Used 10,000 hours on their mobile phones
- And staggeringly, have completed less than 5,000 hours of reading

Today’s learners have not only “gone digital”, but they are also very technologically connected to each other, immediate in their actions, and socially interwoven beyond belief.

As parents and teachers, we need to accept that this new generation, born in 1982 and onward, of which I am representative, will be more technologically
savvy than ever imagined. We must learn about this generation and how we can positively influence their outcome as learners.

In my research, I plan to convey the impact of technology on our current generation of learners and the divide it has created between the learners and their teachers and parents. I plan to research the ways we as teachers and parents can learn and effectively use technological advances in a healthy way for this generation of learners. In addition I hope to find ways to close the generational or digital gap that has been created by new technologies. My research was conducted at the high school where my student teaching took place. I have used a qualitative research approach to accomplish these goals.

**Literature Review**

The current generation of students have grown up with technology as a part of their lifestyle. The students of our current generation are using some form of technology on a daily basis. Through this literature review I will examine the characteristics of the current generation of students, explain the digital gap that has been established due to recent advances in technology, examine the different types of technology being used and how they are being used in our schools. Finally, this paper explores the future of our students as it relates to new technologies.

**Terms & Definitions**

Experts have long studied how technology has affected our young people. However, they have yet to agree upon a term to define our current generation of students. Generations such as the "Baby Boomers" and
“Generation X” are clearly defined and agreed upon by experts, but the current generation goes by many different names. One term that seems to be referenced quite frequently is the “Net Generation” (Degennaro, 2008; Tapscott, 1999; Thompson, 2007). A much larger study, conducted by The Pew Research Center coined this generation of young people, “Generation Next” and “DotNet Generation” (Kohut, Parker, Keeter, Doherty & Dimlock, 2007). In addition, the “Millenial Generation” is used by some researchers (Laurel, 2005) and one of the foremost researchers in the field of technology and education has deemed this generation “Digital Natives” (Prensky, 2001a). The years of birth that seem to correspond most frequently with this generation seem to be 1980 to 2000 (Laurel, 2005). For the purposes of this review, I will refer to our current generation of young people as “digital natives.”

The digital native, today’s students—kindergarten through college—are the first generation to grow up with this new digital technology as being part of their entire lives. “They have been surrounded by and using computers, videogames, DVD players, videocams, eBay, cell phones, iPods, and all the other toys and tools of the digital age” (Prensky, 2006, p. 27). Bennett, Maton, and Kervin (2008) assert that digital natives learn differently from past generations. “They are held to be active experiential learners, proficient in multitasking, and dependent on communications technologies for accessing information and for interacting with others” (2008, p. 776). The way our students are learning is completely different from the old approach of didactic style teaching. Researchers are saying that the old approach is ill-suited to the
intellectual, social, motivational, and emotional needs of the new generation (Tapscott, 1999). Marc Prensky sees the changes and differences between digital natives and who he calls "digital immigrants," technology users older than 30 who can use technology but in ways that reveal their nondigital roots (Herther, 2009). Prensky (2006) said, "this is not just a joke. It's very serious, because 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. 26).

In contrast John Palfrey (2009) wrote that digital natives don't actually constitute a generation but rather a population. He considers digital natives as generally considering cyberspace to be an extension of the physical world and are developing their own social norms around digital culture (Colien, 2009). Palfrey was also quoted as saying that he is "not a huge fan of the term 'digital native' but decided to embrace it" (Harris, 2009, p. 32). In Palfrey's research his goal "was to show that the gulf actually isn't so wide, in really fundamental ways, between the most native of digital natives, and the most troubled of digital immigrants" (p. 32).

The common types of technology are comprised of two major branches, real-time and web 2.0. According to Marc Prensky, author of "Don't Bother Me Mom—I'm Learning!" (2006), digital natives are doing close to everything differently and they're moving at a very fast pace. Prensky (2006) wrote the following:
Simply put, for today’s kids, norms and behaviors are changing much faster than in the past, because the technology changes very quickly and the Natives are programmed to—and want to—keep up with it. It’s important that those of us who are not from the Digital Natives’ generation but whose daily life involves interaction with them, such as parents and teachers, learn as much as we can about the new behaviors—and the new technologies. Some may fear our digital future, and others may question its value. But that’s where we’re headed, we’re never going back, and the train is speeding up! (p. 28)

Those types of technology include how they communicate (instant messaging, text messaging, and e-mail), how they share (blogs, wikis, and websites), how they learn (internet), and how they socialize (MySpace, Facebook). The Pew Research Center sums up the technology being used for communication as “real time technologies” in which the communication is time critical and instantaneous across airwaves (Kohut et al., 2007). Sharing information, learning, and socializing using new technologies can be grouped into what is known as “Web 2.0” technology (Duffy and Bruns, 2006; Thompson, 2007). Web 2.0 is described as a read and write medium. Web 2.0 relies on user participation and is dependent on collaboration and the sharing of information online (Thompson, 2007).
Conflicting Evidence

A debate among researchers has been sparked by the claims of students not only being ‘disconnected’ from their ‘digital immigrant’ counterparts, but also that students are now requiring a different teaching style due to the advances in new technology and their ever changing learning styles. Marc Prensky, who has been mentioned elsewhere in this review, is on the forefront of research as it relates to how students are learning and how teachers must adjust their teaching styles. Prenksy believes that “today’s students are no longer the people our educational system was designed to teach” (2001b, p. 1). He also states that, “to digital natives, school often feels pretty much as if we’ve brought in a population of heavily accented, unintelligible foreigners to lecture them. (2001b, p. 1)” Additionally, digital immigrants have no appreciation for the new skills that students have acquired and have perfected throughout years of practice (2001a).

In addition to the claims made by Prensky, a survey conducted by Project Tomorrow calls for “a growing digital disconnect” between students and adults. They found that 47% of teachers believe their schools are doing a good job of preparing students for their future, however 45% percent of students said that there are [digital blockers] inhibiting their learning. More than 50% of students would like to see more educational gaming in school, but only 16% of teachers said they would support that (‘Speak Up’, 2008). Project Tomorrow CEO, Julie Evans said, “The students in many ways are far ahead of their teachers and parents not only in the sophistication of their technology use, but in the adoption of emerging technologies for learning purposes. It is in our nation’s best interest
that we support and facilitate student usage of technology for learning” (‘Speak Up’, 2008, p.16).

On the other side of the ongoing debate, researchers are finding that there isn’t any evidence that there is a ‘disconnect’ and digital natives don’t know as much about technology as some believe. In addition, this research is also finding that the use of technology is changing our students and that because of the increasing use of technology digital natives are spending less face-to-face time and that their technology skills are great, but their social skills are lacking (Herther, 2009). Bennett et al. (2008) argue that today’s kids are always multiprocessing and are accustomed to learning at high speed, but there is no evidence that a new learning style must be employed. In fact Bennett believes that multitasking results in a loss of concentration and cognitive overload as the brain shifts between stimuli (Bennet et al., 2008). Bennett and her team believe that the claims made by Prensky have little evidence and “such research observes shallow, random and often passive interactions with text, which raise significant questions about what digital natives can actually do as they engage with and make meaning from such technology” (p. 778). Overall, the researchers can agree that the education of digital natives is still a major issue for education and as educators and parents we should play a greater, not lesser role as the digital age grows.

How Is Technology Being Used?

With an understanding of how the common types of technology and the different generations are defined, we can now examine how technology is being
used. Recent research into the role of technology in student's lives revealed that the majority of respondents from a survey of 4374 students owned a personal computer (93.4%) and a mobile phone (82%) (Bennet et al., 2008). The most common uses were word processing (99.5%), emailing (99.5%) and using the internet for pleasure (99.5%). Furthermore, 21% of respondents maintain a blog, and 24% use social networking technologies (Bennet et al., 2008).

The real time technologies of e-mail, text messaging and instant messaging are products that digital natives have had access to their entire lives (Prensky, 2001). They would now consider them to be not just a part of their lives, but an integral part of their lives. The numbers of how often real time technology is being used are overwhelming. Recently, the researchers at The Pew Research Center found that in the past 24 hours, of the digital natives who were interviewed, 50% had sent or received a text message and e-mail, and 29% had sent or received an instant message. In comparison, and to illustrate the generational gap, only 10% of Baby Boomers had sent or received a text message (Kohut et al., 2007). The generational gap shows a steady decrease in real time technology being used as older generations are examined.

It seems that some of the differences can be attributed to what would be best described as “Digital Anxiety.” Many parents and educators are of the belief that technology is drawing children away from authority and responsible adult influence (Tapscott, 1999). In addition, adults are often intimidated by technology (Prensky, 2001b). Some research is also suggesting that “there are clearly areas [among digital natives] where the use of and familiarity with technology based
tools is far from universal" (Bennett et al., 2008, p. 778). Bennett et al. reported that only around 21% of students were engaged in creating their own content for the web and a significant proportion of students had lower level skills than might be expected of digital natives (2008).

The research mostly agrees however, that digital natives are benefiting in every way imaginable and that our fears of "kids just aren't what they used to be" can be pushed aside. Our youth are demonstrating social skills, peer relationships, teamwork, self expression and self confidence that had never been seen in past generations (Tapscott, 1999). The "digital disconnect" and "digital anxiety" demonstrated by our parents and educators has not seen any change in the past six years either. Students are requesting more tech tools being used in our schools which involve mobile devices, simulations, games and collaboration tools. One of the reasons for this divide is that educators and parents believe that online textbooks and interactive whiteboards are enough to satisfy students’ desires for more technology in the classroom (‘Speak Up’, 2008).

Our students have shown a strong connection with new web technologies and will continue to use Web 2.0 technologies as they continue to advance in their design. Again, the numbers are staggering in comparison of generations. When it comes to social networking, 54% of digital natives have used one or more of the popular sites. This is in comparison to only 3% of Baby Boomers surveyed. In addition, 38% of those digital natives say they use social networking sites on a daily basis (Kohut et al., 2007). The more popular sites of MySpace.com and Facebook.com are in the top ten most visited sites on the
internet. According to Thompson (2007), MySpace.com has over 160 million registered users and over 200,000 new members join each day. Facebook.com, which seems to be more popular among students has over 300 million users in just 5 years of creation and continues to balloon nationally and internationally. Social networking sites like MySpace.com and Facebook.com allow members to create their own web pages, with personal profiles, descriptions of their interests, photos, blogs and other features that help other members connect with them, those of which have similar interests. These sites are becoming increasingly "real-time" in nature with the advances in mobile devices allowing web access to these sites (Duffy & Bruns, 2006; Thompson, 2007). More recent advances in Web 2.0 and real-time technology have progressed what was once more popular, instant messaging. Programs like Twitter, have emerged to blend Web 2.0 and Real-Time technology into one. Twitter allows users to send short, status updates like instant messaging was once used for. However, the difference is that updates can be viewed by many individuals known as "followers." Twitter has grown in popularity by nearly double since 2008, and will continue to grow (Honeycutt & Herring, 2008). It is being used by students to answer the question: "What are you doing?"

Our students are finding creative ways to stay connected with each other and as technology advances it does not seem as though adults and those that feel the "digital gap" will be able to stop the ball from rolling. Students are multitasking and collaborating on a grand scale and one of the concerns is that
they are far too absorbed by these new technologies, which is having an effect on their learning (Tapscott, 2001).

*Using New Technology in the Classroom*

A new pilot program in Texas, conducted by Qualcomm and Project K-Nect is being designed to see how new technology can be used to teach math. The project is being used by 8th grade math students. Their tasks involve using their mobile devices to video tape and upload themselves as they work through a math problem given to them by their teacher. They can also use real-time technology to ask the teacher questions pertaining to the problem and collaborate with each other through the same means. Such programs are going to be increasingly used as the statistics are showing an improved understanding of math through standardized testing that used this new technological approach (‘Speak Up’, 2008).

Thomas Reed-Swale, a fifth grade teacher in West Hartford, Connecticut has realized the potential of new technology and has created a program that he says, “is likely to double every eighteen months” (Reed-Swale, 2009, p. 22). His program is called Wolcott Web Wizards, a program where students can display their work online. Reed-Swale found that “students began to take ownership of their web pages, adding colors, changing fonts, and including images (2009, p. 22).” He also found that he was only one or two steps ahead of his students when he received questions like “how do I link to Google?” and “what if we added pictures?” (2009, p.23). As Reed-Swale has found, it seems as though the days
of reading and lecturing from textbooks are gone; the days of Real-Time technology and Web 2.0 are here.

Research Question

Technology is clearly a part of an ever evolving process in our society and it seems as though it will continue to develop in areas that older generations thought were impossible. Digital natives are not just on the cutting edge of these new advances, but they are the cutting edge. However, new technology can have its downsides and drawbacks. What are the opinions of older generations of the new forms of technology mentioned in this paper and what are the feelings of the so-called "digital gap" that has been created between older generations and our young people? In addition, how often are these technologies being used by older generations and what understanding do they have of them? For our young people, how often are they using these forms of real time technology and Web 2.0 advances? Also, what are their thoughts on technology’s impact on their learning and lives?

With these secondary questions, my primary question is: How can we as educators, embrace new technologies and use them to bring the student closer to the classroom and closer to learning? Additionally, how can we close the "digital gap" between our students and ourselves?

Methodology

Methods/Rationale

This project used a qualitative approach. Cher Hendricks, author of Improving Schools Through Action Research, states that the purpose of qualitative research “is to understand and interpret phenomena as they occur in
natural settings" (2009, p. 2). In addition, I have spent time in a specific environment, talking to students and educators as well as analyzed the items that are being studied. The choice to use a qualitative research approach provided a better understanding of student/teacher experiences as it related to technology. Also, perceptions, motivations, and behaviors can be described based on observations and by using an interpretative approach. With these methods I gained incredible insight into the issue of the digital gap.

Sample

My sample included secondary students at an influential Seattle area high school in which advances and the use of technology are abundant. I surveyed 28 students for this research project. Students were identified by “Student” and a letter or letter/number combination to maintain confidentiality for the questionnaire. The students were all 18 years of age. The data for this research was drawn from surveys and observations of both students and teachers in order to answer my research questions.

Instrumentation

Data was collected through the use of surveys. Also, my observations of technology usage will also be included in this project. Specific questions from the survey include:

1. In the past 24 hours did you send/receive e-mail?
2. In the past 24 hours did you send/receive a text message?
3. In the past 24 hours did you send/receive an instant message?
4. In the past 24 hours did you access Facebook/Twitter?
5. How much time did you spend on the internet yesterday?
6. How much time did you spend on your cell phone yesterday?
7. Does technology make people lazier?
8. Does technology make people more isolated?
9. Does technology make people waste time?
10. Does technology make people more efficient?
11. In what ways can teachers incorporate technology into student learning?

Analysis/Validity

Data collected through surveys was scrutinized carefully to look for student trends toward the use of advanced technology and whether teachers are aware and familiar with the types of technology being used. After reviewing this data I have placed them into tables to find trends toward the use of technology. I am part of the generation of students being examined in this project and I understand that my personal biases may affect the interpretation. I have paid careful attention not to allow my personal bias influence the outcome.

Data

Questionnaires

Student questionnaires were given out during class and were collected during the same class period. For questions one through eight students were asked to circle the response that best represented their answer to the question. Question nine was a “free response” format. Student responses to questions one through eight were calculated by the frequency of the response circled. The
results for these questions are outlined in the Tables below and are presented as a percentage of times each response was circled.

Table 1
Student Questionnaire (Questions One and Two)

<table>
<thead>
<tr>
<th>Question</th>
<th>0-10</th>
<th>10-20</th>
<th>20-30</th>
<th>30+</th>
</tr>
</thead>
<tbody>
<tr>
<td>In the past 24 hours approximately how many text messages have you sent or received?</td>
<td>29%</td>
<td>25%</td>
<td>21%</td>
<td>25%</td>
</tr>
<tr>
<td>In the past 24 hours how many times did you access a social networking site such as Facebook, Twitter, etc.?</td>
<td>75%</td>
<td>18%</td>
<td>0%</td>
<td>7%</td>
</tr>
</tbody>
</table>

Table 2
Student Questionnaire (Questions Three and Four)

<table>
<thead>
<tr>
<th>Question</th>
<th>0-3</th>
<th>3-5</th>
<th>5-7</th>
<th>7+</th>
</tr>
</thead>
<tbody>
<tr>
<td>How much time (in hours) did you spend on the Internet yesterday?</td>
<td>57%</td>
<td>25%</td>
<td>14%</td>
<td>4%</td>
</tr>
<tr>
<td>How much time (in hours) did you spend on your cell phone yesterday?</td>
<td>79%</td>
<td>14%</td>
<td>4%</td>
<td>4%</td>
</tr>
</tbody>
</table>

Table 3
Student Questionnaire (Questions Five through Eight)

<table>
<thead>
<tr>
<th>Question</th>
<th>Yes</th>
<th>No</th>
<th>Maybe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does today's technology make people lazier?</td>
<td>46%</td>
<td>32%</td>
<td>21%</td>
</tr>
<tr>
<td>Does today's technology make people more isolated?</td>
<td>32%</td>
<td>46%</td>
<td>21%</td>
</tr>
<tr>
<td>Does today's technology make people waste time?</td>
<td>57%</td>
<td>21%</td>
<td>21%</td>
</tr>
<tr>
<td>Does today's technology make people more efficient?</td>
<td>46%</td>
<td>7%</td>
<td>46%</td>
</tr>
</tbody>
</table>
Data collected for question number nine was recorded in short answer “free response” form. The question on the student questionnaire was, “In what ways can your teachers incorporate today’s technology into student learning?” The collected responses are outlined in a Table 4 below.

**Table 4**  
_Student Questionnaire (Responses for Question Nine)_

<table>
<thead>
<tr>
<th>Student Identity</th>
<th>Response</th>
</tr>
</thead>
<tbody>
<tr>
<td>Student A</td>
<td>“Creating websites and web tools is really useful for increasing contact and efficiency.”</td>
</tr>
<tr>
<td>Student B</td>
<td>“Text the hw haha i don’t know”</td>
</tr>
<tr>
<td>Student C</td>
<td>“Use entertaining ways to introduce new ideas: - videos - demonstrations”</td>
</tr>
<tr>
<td>Student D</td>
<td>“Don’t”</td>
</tr>
<tr>
<td>Student E</td>
<td>No response</td>
</tr>
<tr>
<td>Student F</td>
<td>No response</td>
</tr>
<tr>
<td>Student G</td>
<td>“Smartboards!”</td>
</tr>
<tr>
<td>Student H</td>
<td>No response</td>
</tr>
<tr>
<td>Student I</td>
<td>No response</td>
</tr>
<tr>
<td>Student J</td>
<td>“Smart board”</td>
</tr>
<tr>
<td>Student K</td>
<td>“Facebook is a good way to spread news to particular groups of people.”</td>
</tr>
<tr>
<td>Student L</td>
<td>“Online activities?”</td>
</tr>
<tr>
<td>Student M</td>
<td>“Visualizations, simulations, videos, demonstrations.”</td>
</tr>
<tr>
<td>Student N</td>
<td>“Text test/Hw reminders”</td>
</tr>
<tr>
<td>Student O</td>
<td>“Exposure to material is the best way for one to learn it. The more material the teacher can expose for students through”</td>
</tr>
</tbody>
</table>
Data Analysis

After conducting the research on student use of current technology and their views on how teachers could incorporate these new technologies into the classroom, there are many ideas that support the use of more technology in the classroom.
Cellular Phones and the Internet

Cellular phone use has been on the rise recently and the student use of cell phones in the classroom has increased also. Not surprising, 79% of the students used their cell phones between 0 and 3 hours the day before the survey. What was surprising however, was that 4% of students used their cell phones 7 or more hours the previous day. In addition, a quarter of respondents reported that they sent or received 30 or more text messages the previous day as well.

The popularity of the Internet and social networking sites has also been on the rise in recent years. 43% of students reported that they spent 3 or more hours on the Internet in the previous 24 hours. Also, 75% of students reported spending 0 to 3 hours on a social networking site during that time.

Feelings Toward Technology

Students were asked to rate the way they felt about technology and what it can do and has done for our society. Almost half of the respondents, 46% reported that technology makes people lazier, and 57% reported that technology makes people waste time. At the same time, 46% of the students reported that technology makes people more efficient.

Integrating More Technology Into The Classroom

From the students that responded to the short answer question about how teachers can integrate more technology into student learning, one student responded by saying, "Don't." However the majority of students provided many ideas on how to incorporate some of the technology that students are becoming accustomed to in their daily lives. For example, several students mentioned the
use of online activities, quizzes and lectures that they could access from home. Several students also remarked about creating Facebook or web pages for teachers to post homework, assignments, and create a place to ask questions online. From the surveys given to students in this research paper, it seems that they would like to see more access to technology and a greater integration of technology into their learning. As one student mentioned, “It can make teachers more accessible and the learning material will become enhanced.”

Implications

As Student X mentioned in their survey, by using these cutting edge technological advances, teachers can be more accessible to students through a medium they are familiar with. With the amount of use students are getting out of technology, these methods can enhance the learning experience. With the help from school districts, every teacher has the ability to set up a personal website that they can post their homework, assignments and reminders for tests and quizzes. Considering almost half of the students surveyed are using the Internet 3 or more hours per day, if the website is constantly updated, students could put teacher websites on their daily “website visit” list. Expanding beyond teacher websites, social networking sites like Facebook can provide a virtual forum for students to ask questions and for students to help each other outside of the classroom. In addition, teachers can be available to answer questions that may have been missed during regular class time. Utilizing these methods will help to answer the original research question for this paper, “How can these technologies bring students closer to the classroom and closer to learning.” My
study leaves me questioning which of these methods to engage students technologically will be the most effective and the most utilized by students.

Conclusion

The study that I have conducted is important to me because I hope that it helps bridge the digital gap between our students and teachers. The advances of technology have not only aided students learning but technology will continue to interest and engage students for generations to come. As educators, we must stay in tune with the advances and learn new ways to use these technologies to our advantage rather than discarding them. Digital natives are far from taking steps backwards and returning to traditional learning without technology. Therefore, as educators we must keep up with our students and take an active approach to learning about new technologies. In addition, new technologies have presented creative ways to engage students with tools they are already familiar with.
References


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