The New Literacy Crisis:

Immigrants Teaching Natives in the Digital Age

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Students today have never experienced life without email, and they may never use a printed set of encyclopedias. They have a natural level of comfort with technology that we must work hard to achieve; yet we are their teachers. Our students are the "digital natives" and we are the "digital immigrants" (Prensky, 2001a). This irony has been fully realized by all K-12 teachers who attempt to integrate technology into their instructional practices. We wonder, "Who is the teacher?" and "Who is the learner?" We question if we, as digital immigrants, still have knowledge to impart to our students, the digital natives.

Digital natives are students who have had frequent and consistent exposure to technology throughout their lives. Many were born after the personal computer was introduced to households. Today, 71 percent of our students have access to a computer at home and 61 percent of our students use the Internet daily to communicate with friends, conduct research, and post on their personal web site. The digital native has the ability to watch television, instant message friends, research on the Internet, and play computer games all simultaneously while talking on a cell phone about the day's events (Jones, 2002).

The new reality is that our role as a teacher incorporates both teacher *and* learner. With the explosion of information and technology in recent times, teachers cannot possibly expect to know it all. As McKenzie (1998, ¶17) stated, "A good teacher knows when to act as a 'Sage on the Stage' and when to act as a 'Guide on the Side.'" Education is shifting from directed to constructivist learning, largely aided by the expansion of technology in the classroom. Instead of feeling threatened by the knowledge students bring to the classroom, teachers must learn to embrace students' skills with technology and implement students' strengths into the classroom environment.

The New Literacy Crisis

Students still have much to learn. Children become fluent in their native language almost as naturally as they learn to walk, but they still must be taught to read and write to become literate in the language. Likewise students, as digital natives, may have an inherent digital *fluency*, but they still need to develop digital *literacy*. Aristippus, a Greek philosopher, once said, "Native ability without education is like a tree without fruit" (ThinkExist, 2006). Teachers have the important job of using their traditional knowledge to expand students' "native abilities" and cannot assume students are digital experts. Even with the technology skill set of a digital native, students still need teachers to teach them to be *literate* members of the information and technology-rich society of the 21st century.

Studies show that digital natives have different learning preferences than students of yesteryear. They tend to collaborate in teams or groups on assignments; they like structure and are achievement oriented. They also thrive on and seek out dynamic, interactive environments that have a rapid pace. As a result, the digital native often does not spend time reading content or reflecting and processing on the content they do read. The digital native is a visual kinesthetic learner and prefers images to words. The digital native also thrives on experiences that make a difference in their world. What can we do as teachers to make our students literate? We must find instructional strategies that provide rich learning experiences and at the same time strengthen areas that students need to enhance, such as reading and reflecting on the content being explored (Oblinger & Oblinger, 2005).

How can teachers avoid this new literacy crisis and ensure that students do not grow into "trees without fruit"? First, teachers must gain a better understanding of the digital natives; second, teachers must define what it means to be digitally literate; and third, teachers must learn how to most effectively teach the digital natives. Only through this process can digital immigrants educate digital natives and nurture them from seedlings to fruit-bearing members of the digital age. Teaching in today's digital world requires the development and dissemination of practical strategies for using technology. Teachers must embrace technology along with their students and strive to be proficient at seamlessly integrating information literacy skills into their lessons and instructional practices. Only then will immigrants and natives alike develop digitally literacy.

Who are these digital natives, really?

We already know them well – teachers see and interact with these digital natives everywhere, from the malls to the playgrounds, the libraries, and schools. We catch sight of them watching DVD movies in the family SUV on our highways, tapping their feet to the beat of music on tiny MP3 players, and creating text messages on telephone keypads almost as swiftly as they talk. Compare that to just 20 years ago. We watched movies recorded on VCR tapes, youngsters kept their music close by carrying behemoth boom boxes on their shoulders, and most of us had not yet been introduced to email, much less a concept such as text messaging. It is no surprise that there is a digital divide between those who have grown up immersed in a digital world and those who have watched modern technology develop at an amazing speed.

What is so special about these natives? Most importantly, digital natives really "get" technology. They have been surrounded by and are using technology in most aspects of their lives. Digital
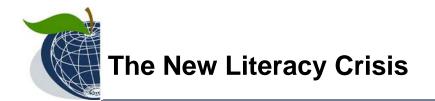
natives navigate through the menus on a cell phone or digital camera with ease, they can play a new video game without sitting through the introductory screens, and they realize the power of the Internet as an expanding source for the information they seek, as well as a place to network with one another. Prensky (2001b) advocates that digital natives "think and process information fundamentally differently from their predecessors" (p. 1). This knowledge necessitates changes in instructional methods and content if schools intend to meet the rather steep needs of the digital natives. In fact, Prensky goes on to assert that embedding learning into computer-based games in all subjects is the answer to more effective instruction for digital natives.

To muddy the waters of the digital native further, new subgroups are emerging and being studied. "Power users" are defined by the Education Development Center as youth "distinguished by their self-selected, long-term, intensive experiences with technology" (Certiport, 2006, p. 1). They are described as thinking, behaving, and solving problems differently from their peers who are not as technologically adept. By age 15, they are "in control of their technologies and have become self-directed learners, seeking and constructing new learning from their environments" (Certiport, p. 1). Another group, referred to as "tweeners," exhibits characteristics indigenous to both digital natives and digital immigrants (Cross, 2006). Tweeners are youth who grew up with computers, know how to use computers, and are generally interested in technologies. Technology does not define tweeners to the extent that it does the natives, but their comfort level with technology allows them to "walk relatively comfortably among [the] two cultures" (Cross, p. 52). However, consider who the digital natives also are. Consider students who do not have access to video games, cell phones with text messaging capability, and computers with high-speed Internet access. Consider students with special needs, whose learning challenges may inhibit their access to technology. Consider also the barriers in place for English language learners, especially as they seek information on an Internet that is heavily populated by solely English-language web pages. A brief look at most video games on the market today makes it abundantly clear that they are geared towards pursuits most commonly associated with boys; action, adventure, and destruction-based games, bringing up the notion that game-based instruction may be gender-biased. Vast regional differences in students' access and exposure to technology exist both in the home and in schools. Digital natives are a diverse population.

With this rather wide spectrum of technological capabilities among the digital natives, digital immigrants face a formidable task. Any attempt to integrate technology without addressing the diversity of students' digital fluency will fail. There is no "one size fits all" solution for ensuring students acquire information literacy skills. Defining and meeting this need for information and technology skills across all student populations is indeed the new literacy crisis.

What does it mean to be digitally literate?

Just as most children learn to speak as toddlers, digital *fluency* is achieved naturally by most digital natives. A child must be educated in reading and writing in order to fully master a language. Simply speaking a language is not the same as being literate in that language. In the same way, digital *fluency* does not equal digital *literacy*. Our students need to be educated in skills that will allow them to be critical and effective users of technology. The American Library Association (1989, ¶ 3) defines information literacy as a set of abilities requiring individuals to "recognize when informa-

tion is needed and have the ability to locate, evaluate, and use effectively the needed information." The authors of this article further define information literacy as the ability to: articulate a problem to be investigated, locate and assemble information, scrutinize gathered resources, process and apply information towards a solution, and contemplate the effectiveness of the entire process. These skills are not indigenous to the digital natives. Assuming our students are digitally *literate,* simply because they are digitally *fluent,* is not only doing them a great disservice, but it is fueling the literacy crisis of the Digital Age. Our students need to be taught these information skills in order to achieve digital literacy, and only then will they become fruitful members of the Information Age.

Studies reveal that, although immersed in technology, students are deficient in digital literacy skills. Research by the Pew Internet & American Life Project shows that 55 percent of youth believe it is essential for today's children to learn how to use the Internet to be successful and another 40 percent believe it is important (Lenhart, 2001). According to this same study, 71 percent of online teens reported relying mostly on Internet sources for their research. Another study conducted by the Pew Internet & American Life project shows that only 30 to 40 percent of teenagers fall into a category they call Internet-savvy. These Internet-savvy students have been online for several years and are developing digital literacy skills. They have several email addresses and instant messaging (IM) identities. These students rely heavily on the Internet for both school and their social lives (Levin & Arafeh, 2002). Unfortunately, these savvy natives are in the minority; this still leaves 60 to 70 percent of students who are not digitally literate.

As teachers we have the unique responsibility of helping all students move beyond digital fluency and achieve digital literacy, no matter where they are on this journey when they enter our classrooms. By modeling literacy skills across all subjects in a structured manner, we can encourage our students to explore the information literacy highway. One structured method, developed by the authors, follows the mnemonic "D-I-S-C-O-V-E-R". The DISCOVER method provides steps that can be implemented in any content area to help students work effectively with information.

D-I-S-C-O-V-E-R Information Literacy:

- Define – Define the problem to be solved and the information needed to solve it.

- Inquire – Inquire about a variety of resources. Include more than just the Internet.

- Search – Search for information in multiple locations including different search engines and offline resources.

- Collect – Collect information you have found for further consideration. Cite all sources as you work.

- Organize – Organize the information collected and refine your search if needed.

- Verify – Verify the authenticity of information gathered. Is it unbiased, reliable, and truthful?

- Extend– Extend your understanding through analyzing the gathered information and shar-

ing with others.

- Reflect – Reflect on the entire process. Did you accomplish your goal? Should the goal be redefined or reevaluated?

The DISCOVER method is one way of looking at information in a new light. This approach looks at information acquisition as a process which involves critical thinking. It is just one possible step across the divide that will help both digital natives and digital immigrants achieve digital literacy. As teachers begin to integrate this and other strategies across the curriculum, information literacy will become a critical part of every student's education and we will be preparing our students for life in the Digital Age.

How do we teach Information Literacy to the Digital Natives?

As digital immigrants and educators, we must first recognize the need for change in today's classrooms. An intrinsic value must be placed on the success of immigrants and natives in the 21st century. The curriculum of every subject area and grade level should emphasize critical thinking and research skills in order to propel our students toward digital literacy. For a more specific list of 21st century skills, review the framework at the Partnership for 21st Century Learning Web site (http://www.21stcenturyskills.org/), which outlines the digital skills needed to succeed in our world. Our schools are quickly becoming outdated and, by understanding the changes necessary, we can guide our educational system into the Digital Age.

It is important to emphasize that we need to focus on the pedagogy and not just on the technology. The digital native does not see technology; they see the activity first and then the technology as a tool to help them communicate, decipher, discover, and explore content. As teachers we need to think in the same manner as our students. We need to provide experiences that engage students and involve interactive, primary source data that they can manipulate and use for practice. A good example is "The Valley of the Shadow" (http://valley.vcdh.virginia.edu/). This dynamic activity allows students to explore first-hand records that include entries in diaries, newspaper articles, and census data of families living at the time of the Civil War and then after working with these documents draw their own conclusions from the material. This activity successfully uses technology as a tool to engage students in the process of learning (Oblinger & Oblinger, 2005).

Teachers must also push themselves to be risk takers. According to Prensky (2005, ¶ 7), "...we must take our cues from our students' 21st century innovations and behaviors, abandoning, in many cases, our own pre-digital instincts and comfort zones." Abandoning a comfort zone is not exactly a reassuring notion for teachers, but that is a key piece of our success in teaching the digital natives. We cannot be afraid to learn from our students. In order to truly engage our native students in and out of the classroom, we must take the first step across the generational divide.

As teachers, we must learn the language of the digital natives and listen more to our students. As Prensky (2006, p. 140) writes, "The more you engage your kids in conversation about their world and the things that interest them, the more they will appreciate what you are doing, and the more they will be open to talking, sharing, and accepting suggestions and guidance." As digital immi-

grants, we should teach our students to become literate in their own language. We need to revise our own language skills and model strategies within our own practices. Our students will respect our efforts and learn from our actions. We must learn the language of the natives through practice! Using technology as a tool to communicate is what this generation is great at. To engage our students, teachers can begin using technology as a tool to communicate with students, to create a community of learners, and to enhance the reflective capabilities of our students. Students are using instant messaging, social networking sites, and wikis to communicate on a daily basis outside the classroom; why not bring some of these same tools into the class to stimulate learning and increase the level of engagement and interactivity between teacher and student and student-to-student?

As teachers, we need to engage the digital natives in course content. Traditional information delivery is simply tradition in a non-traditional age. Digital immigrants must acknowledge that students are learning skills for a new time with tools beyond this time. Our activities need to embrace flexibility. Digital natives need content delivery in new forms. As their teachers, we should attempt to expand traditional units with resources including videos, online activities, collaborative tools, and new approaches to old material. The National Council for Teachers of English sponsors the Web site http://www.readwritethink.org, complete with lesson plans, student digital tools, and professional resources. We must seek similar innovative professional resources and break away from only utilizing the textbook. We must derive new approaches to the old standard.

For example, since digital natives are comfortable creating digital information such as videos, why not add this component into the classroom to engage students further with the content? With the introduction to podcasts came video podcasts (vodcast). Students can now incorporate images and sound to create a video incorporated voice recording that can be played over the Internet or on an MP3 player. What a great option for learning about cultures of the world. How are people the same? How are they different? Students could prepare an oral presentation around these questions and then present their case to their peers and the world by creating a vodcast. This is a multi-dimensional activity that requires students to explore a meaningful and relevant topic by conducting research, organizing their research, writing a script, and then compiling the research and planning into a meaningful product. Throughout this process teachers can conduct discussions and provide opportunities for students to reflect on their findings as these are the skills digital natives are lacking. In addition, teachers could introduce students to Google maps so they can find a map of their project country to include in their vodcast. The CIA Factbook (also available online) could be used to find information specific to their country, and students could also conduct specific Internet searches for country information and images to include in the vodcast. The final step would be to have students combine all of their elements to create their vodcast presentation and then share their new knowledge with fellow classmates and others around the world through Web technology (Apple, 2007).

As digital immigrants, we have the subject matter knowledge to teach our students but at the same time we must be able to seek out assistance with instructional activities or technological support. We must expand our traditional strategies and ask our fellow teachers about other instructional strategies that have worked for them. Teachers must seek out instructional and/or technology support personnel for assistance as we become digitally literate ourselves. We must ask ourselves what

our students would like to learn and include students in finding the answers to their own questions. The digital immigrants are both the learner and the teachers in this digital age. In order for digital immigrants to continue to be excellent educators they must be willing to adapt to the jumbled evolution that drives 21st century teaching and learning.

The digital immigrant must seek out learning from all resources available. They must go online and discover the plethora of materials waiting to be discovered. They must talk to those around them and learn about this new digital native sitting in their classroom and how best to engage them. The digital age is here.

Conclusion

The age of technology has created a divide between the digital immigrants and the digital natives. As this paper has explored, we are facing a literacy crisis concerning how the digital immigrants can most effectively teach the digital natives the skills for achieving digital literacy. We are experiencing phenomenal changes in education as we progress deeper into the digital age. As educators, we must learn how to teach in this technology-rich society that is new to us as digital immigrants. We must combine the effective practices we have already mastered with new strategies in order to successfully educate the digital natives. How can we learn new strategies? We must take the initiative to DISCOVER them ourselves. As educators we know that learning is an important part of teaching and we must collaborate with each other to collect and share new ideas and practices. We must ask questions and search for answers. We must seek new ideas by reaching beyond our classroom and even our schools to teachers and professionals around the world. The Internet has opened the door for sharing and communicating information that we as educators can use in many ways. Teachers must recognize students as resources as we learn to speak their language and define their needs. The solutions are simple, but like anything new and different, they will take time and practice. There will be bumps in the road, but we cannot learn without making mistakes. Education has never been a static field, and the digital age is proving to be no exception. Change is necessary and we must embrace it. As teachers, we can use technology effectively in our classrooms to bring about digital literacy.

The New Literacy Crisis

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The New Literacy Crisis

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