A Nation of Digital Immigrants: Four Principles

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Abstract

Teachers often feel intimidated by the technologies available to them and simultaneously frustrated by the lack of availability of useful technologies. Those teachers characterized by a popular metaphor as digital immigrants may feel marginalized or unable to contribute to the larger dialogue. In this article, the authors argue that teachers, even those who consider themselves as outsiders or digital immigrants, have much to contribute to thoughtful application of technology as a means of learning and as a form of literacy. Four principles for effective technology use are explored, and the editors suggest new metaphors, digital tourists and ambassadors, to promote twenty-first century literacy.

Key Words: Millennial learners, digital immigrant, technology

Mark was petrified. As a teacher candidate, he looked forward to the time when he would be in front of a class teaching math content; however, his professor, Dr. Grisham, asked him to create a podcast. While he had heard of podcasts, he had never downloaded one. Now his literacy in the content areas class requirements demanded that he also create a podcast, and he was worried. He told us, “I was very fearful of this whole class because my computer skills are very, very low.” As a content teacher-to-be, a course in literacy with an emphasis on information communication technologies (ICT) seemed too much for Mark. At the end of the course, his view had changed as he described the podcast experience: “By calling some of the students in this class, we became friends and they helped me. And my wife helped me to pass this class. I told Dr. Grisham right up front that I was afraid of this class. She told me to be patient and she would walk me through it. And she has.”

Teachers and those who want to be teachers know that their students must be proficient with technology in the 21st century. Proficiency transcends mere ability to use the tools and work around the problems they sometimes present. Teachers proficient with technology must also know why a tool will be useful and how it might be used for educational purposes. As important, they face the ever-changing nature of the tools. Clearly, teaching and learning in the millennial generation is a complex endeavor.
METAPHORS FOR THE DIGITAL AGE

Metaphors expand our thinking in ways that may not otherwise occur. Carl Sandburg compared fog and feline feet in such a way that has forever associated these two unlike things in their minds of many readers.

The fog comes
on little cat feet.

It sits looking
over harbor and city
on silent haunches
and then moves on.


It has been argued that metaphors are the fundamental condition of human thought transcending poetry to include cultural conceptions (Lakoff & Johnson, 1980). For example in English-speaking cultures, “up” is a metaphor for “good” when the physical position in space is not otherwise relevant, “She’s feeling up today.” In metaphor, we map common attributes of one apparently unlike thing with another. Cats’ feet and fog, two very unlike things, may share the attributes of stealth, quiet, and grace. At the same time, metaphors may break down and fail to serve our needs. Fog may, at times, be ominous rather than graceful.

While metaphors and analogies explain cultural knowledge and narrate its complexities, they also exert a powerful reductive force. When a single metaphor or analogy describes a phenomenon, relevant attributes may be ignored or underlying causes left unaddressed (e.g., Spiro, Feltovich, Coulson, & Anderson, 1989). A particularly appealing metaphor may obscure important characteristics and attributes worth our attention. Moreover, such a powerful metaphor may even ossify thinking such that it becomes difficult to think of the target phenomenon in any other way, much like the two-valued orientation that Hayakawa and Hayakawa (1990) indicate is a hindrance to understanding problems or thinking about solutions. A two-valued orientation provides only two choices ignoring nuances and complexities neither choice makes plain. Metaphors can be useful educational tools that sometimes outlive their usefulness. For example, Spiro, et al (1989) showed how the analogy of the circulatory system as the plumbing in a house ultimately did the learners in the medical field a disservice because it oversimplified a complex construct. Complex constructs require that students have guidance through a poorly structured domain (such as the Internet and associated new literacies).

In 2001, a metaphor to help educators and technologists think about the students who sit in our classrooms with cell phones texting each other and listening to MP3s while outlining a chapter of the social studies book. Prensky (2001) proposed that today’s digitally-oriented students are digital natives fluent in the language of electronic technology. In contrast, Prensky also proposed that many adults, including teachers, are digital immigrants who still print out emails and call someone to the computer to see an interesting website rather than simply emailing the link to that person. The metaphor of digital immigrants and natives has proved popular as a way to think about the needs of twenty-first century students. Clearly, there are differences, as well as similarities, between generations (cf. Eisner, 2005); however, this article proposes that in 2011 the immigrant/native metaphor is outdated and in danger of constraining innovative teaching during the next decade.
WHAT'S NEW?

When we attended high school, some of our teachers were not very proficient users of the 16 millimeter projector, high technology in those days. Did these teachers simply resolve not to show films (this was before the video tape and certainly before the DVD)? No, they did something radical; they asked the students to run the projector. Capitalizing today on the digitally talented students who sit in our classrooms to put technology to use is certainly not a new idea. However, it has always been the teacher who knew which film to show and how it would help us learn. Paulo Freire (1970) reminds us of that which teachers both before and after him already knew well: our students are a source of strength—they learn but they also teach. Sophia, another teacher candidate, emphasized during a focus group interview, part of a study in progress, that had she been asked to create a podcast as a teenager, “I would have gotten together with my friends, try to make it entertaining, and in the process of that learn more information.” Learning by drawing on the expertise of others and the social nature of adolescents would have appealed to Sophia when she was a teenager. As a teacher-candidate, she knew she would improve content learning through working collaboratively.

Students of the twenty-first century insist on gaming to learn, some claim (e. g., Prensky, 2005). Games have the potential to provide feedback, choices, and opportunities to put knowledge to use in interesting ways (Gee, 2003), but that’s not new. During the first Gulf War, seventh graders with whom we worked examined the dynamics of the region by playing a game based on Risk® that we created with paper and plastic markers. Teachers have known for centuries that simulations and games may make possible learning that no other format can achieve.

What is new about the technology of this century is that it makes so much information available and with an immediacy not possible or practical until the early 1990s. Pushing information at kids has also gone on for centuries, but twenty-first century technology allows learners to engage with the creators of that knowledge while also permitting them to be creators of knowledge that can be shared well beyond the walls of the classroom. This is where educators can and should take the lead (Travers & Decker, 1999), no matter their technological prowess, and where the metaphor of immigrants and natives is no longer useful. Many of our students can show us how an electronic tool works; teachers know why the tool should be used. It is problematic to believe that teachers should simply follow their digital native students into the twenty-first century providing whatever the latest electronic device is in the hope that student learning will result. Simply giving an assignment and turning students loose on the Internet is not the same as teaching students to think critically about what they are learning, how they are doing so, or why.

LISTEN TO THE DIGITAL IMMIGRANTS

Earlier, we suggested that the digital immigrant/native metaphor has outlived its usefulness as it is currently construed. The problem is that the concept of the immigrant in this metaphor has been characterized as someone who cannot and even will not adapt to change. The digital immigrant is too firmly rooted in the past, is not digitally fluent, and is too hard for digital kids to understand on their terms, according to Prensky (2001). However, we argue that the United States, like many others, is a “nation of immigrants” and this is a strength that has built a powerful nation. Geographic immigrants, those who move to a new country, contribute to the adopted culture in vital ways. The digital immigrant, according to the metaphor, is marginalized and cannot contribute to dialogs about instruction and learning in this century. The digital native has
always known a world with cell phones, computers, and iPods; the digital native is technologically fluent. But what of the many teachers who remember dialing a rotary phone or who did not use a remote to change the television channel? Are they to be marginalized by accident of the year of their birth? They are not digital natives by definition, yet they are important contributors to the educational world of this century. These educators are instructional natives who know how students learn and what resources to bring to bear.

Moreover, as the present decade becomes part of the larger tapestry of the 21st century, more teachers will be part of the millennial generation (Strauss & Howe, 1991). We surveyed 48 teacher-candidates in a literacy methods course recently; 48% were between the ages of 21 and 26. These teacher-candidates were born and raised in the digital age. However, when we asked them about their biggest concern regarding the use of technology in their own content-area classrooms, 85.5% were afraid that technology would in some way present an obstacle to their teaching. The most common concern we noted in open-ended responses was that their own students would know more about technology use than they would. Keep in mind, nearly half of these soon-to-be teachers are digital natives 26 years old or younger, and they felt as uncomfortable about technology as their older classmtes.

Age need not be a barrier to acquiring computer knowledge (e.g., Warren-Peace, Parrish, Peace, & Xu, 2008). Teachers routinely choose and learn to use assistive technologies that include a wide range of devices that provide individuals with disabilities access to their homes, schools and communities (Bryant & Bryant, 2003). High-tech adaptive technology implies a level of complexity that usually involves a computer or computer components. Examples of indispensable high-tech devices include ventilators, communication hardware and software for voice output of printed text, and specialized wheelchairs (Smith, 2007). Advancements in assistive devices have provided individuals with physical or health disabilities freedom of movement that was previously accomplished only with great difficulty. Wheelchairs, prosthetic devices, and computers provide individuals with physical or health disabilities opportunities to interact with their world in ways that were previously unattainable. Teachers embrace the inclusion of students into their classrooms who need and use these technologies when a generation ago none of the assistive devices named above existed. As students who need to use such tools do so, their classmates and teachers learn about the tools and the related content along with them, building learning together through the use of technology (e.g., Chandler-Olcott & Kluth, 2009).

AMENDING THE FOUNDATIONS OF THE METAPHOR

Digital immigrants, like teachers who learn to use adaptive technologies, can actively participate and engage the twenty-first century student, and it happens all the time. We have worked with teachers who bravely signed up to work on their teaching skills in online courses even though they were unaware that there is no need to hit “enter” at the end of every line, literally double-spacing their work by hitting the enter key twice. Such bravery is to be commended. A word of explanation for the digital native: Before word processors there were typewriters, the earliest of which simply stopped producing text at the end of the line until the typist hit a return key (before the return key there was a lever).

A new metaphor may help teachers and trainers from the baby boomers to the millennial generation think about their roles in 21st century. Instead of a two-valued outsider/insider
role for those who do or do not seem to “get” or understand technology, we propose two new metaphors for teachers of millennial generation students.

The first metaphor is that of the digital tourist who tries out new technologies, comparing the known and considering the possibilities. Collaboration with learners to establish relevant uses of technology is the hallmark of the thoughtful digital tourist. Digital tourists are also instructional natives who make choices about what is useful and what is not to advance educational goals and help their students establish their own goals for learning. The second is the digital ambassador, which we explain shortly.

As digital tourists, teachers who face curricular demands and work with students who seem to be more technically adept can begin to think of themselves as insiders (Lankshear & Knobel, 2003) who know and use technology to encourage and connect students with each other and with big, new ideas. A teacher will use new technologies across the wide span of a career that will no doubt include many new innovations undreamed of today. The changing or deictic nature (e.g., Leu, Kinzer, Coiro & Cammack, 2004) of new literacies requires educators to do more than simply adopt the newest tools. A few years ago, the authors of this article proposed a study of handheld computers (The Palm Pilot™ being one example). By the time the study proposal was prepared, new tools such as integrated phones with calendar and texting features had replaced many of the handheld computer functions we sought to study. Thus, we see several principles that apply to and extend the metaphor of digital tourist.

PRINCIPLE NUMBER ONE:

Digital tourists can and will use technology for the betterment of the profession and their students. Technology brings us together (cf., Buchanan, 2002) and increases the resources to which students have access. One result is that the teachers’ role as facilitator is increasingly important as educators can bridge traditional and new literacies (Leu, Leu, & Coiro, 2004). We call the experienced and effective teacher an instructional native to highlight the extensive expertise of many teachers who might otherwise be marginalized as digital immigrants. Teachers, as instructional natives or insiders, can help students, who may be novices or even academic outsiders, put technical knowledge in service of learning.

PRINCIPLE NUMBER TWO:

Our high school teachers of the recent past knew that it didn’t matter if they couldn’t thread the 16 millimeter projector. Many students, but not all, did know how and were happy to do so. Teachers all over the world have learned the power of the Internet, yet they can’t design a webpage where they post homework assignments, student projects, and an email link. What do these teachers do? They ask their students who do know how and are increasingly engaged as they contribute to the life of the academic community (Martinez & Harper, 2008). A recent study (Schrum, Shelley, & Miller, 2007) arrived at some surprising conclusions about tech-savvy educators. Of the tech-savvy teachers, 57 percent were female and 80 percent were over 40 years old with 10 years or more of teaching experience. Slightly more than half worked at the elementary level. More important, teachers have long known that what one student knows can be of benefit to another. As we noted earlier, our survey of teacher-candidates found that more than half of these teachers-to-be were concerned that their students would know more than they do about technology. Seventy-six percent of these teacher candidates are in the 21 to 32 age bands and nearly half are age 26 or less; they are the teacher candidates that might be expected to be least concerned that students in their classes would be more technically savvy.
The most technically proficient are sometimes the more experienced teachers while those most concerned may be those just starting out as educators. When one digital native needs to create a Flash movie but doesn't know how, that student finds someone who does. Savvy educators learn from this model by creating a community of competent learners who rely on each other when the needs arise. An effective model of students as collaborators is the GenYES project. Learn about it by navigating to: http://www.genyes.com/ After creating a podcast of his own, Mark told us and his coursemates in a focus group interview that the technically proficient students in his math classes, “…will implement some great ideas” and “be more creative than we are” demonstrating how he had grown as a teacher less afraid of what his students might know that he does not. Riley said, “I have a 13 year-old, and I learned so much from him.” So principle number two is: Teachers don’t have to know how everything works—only what and who to ask.

Digital natives don’t know how everything works; they may figure it out or they may just ask someone who does know. Moreover, digital natives may not know why a technology is particularly useful since they lack a reference for comparison. A key tenet of twenty-first century thinking is embedded here, as well. Teachers have never known all the answers, but they usually know where to look. The business community is catching on, and so are educators. Knowledge management theory suggests that teachers and students learn how to find the information they need “just-in-time” to put it to good use when needed rather than stockpiling information (Stewart, 1999). Good teachers have used this approach for millennia; but the current era provides a unique opportunity to make this the paradigm of twenty-first century education. More than programming tools or gaming, which may change with the introduction of new technologies, knowing how to understand and manage knowledge is a skill that twenty-first century students will need as they enter the world as productive citizens. Faigley (1999) compared obtaining information from the Internet to getting a drink from a fire hose; a lot of information comes at the reader all at once. Teachers who use information-communication technologies must think about and teach students how to evaluate what is found in an Internet search, for example. Students with access to widely diverse information must also learn to be discriminating consumers of information. Uniquely situated to teach students these tasks are the digital immigrant teachers willing to tour new technologies who are moving into the twenty-first century with their digital native students.

**PRINCIPLE NUMBER THREE:**

Many readers of this editorial will recognize a phenomenon called absent presence—individuals may be physically present in a room but not socially or educationally available since they’re plugged into the MP3 player, the cell phone, or lost in the computer game (e.g., Gozzi, 2006). Those who have observed this behavior may think that technology puts up walls between people, and this may be so on occasion. However, this article proposes that the true worth of technological literacy in twenty-first century schools is that it can bring people together. Threaded discussion permits students to converse meaningfully about their literature selections long after the class period is over and the bus has dropped students off at home (e.g., English, 2007; Grisham & Wolsey, 2006). Educators and parents can communicate more readily in the asynchronous world of email than they ever could trying to set up a meeting or making a phone call after school hours. In Kentucky, students are no longer limited by geography when an advanced placement class is not offered at the neighborhood school (Wolsey, 2007). The Kentucky Virtual
Hi gh School (http://www.kvhs.org/), as one example, makes it possible for the rural Kentuckian to have many of the same opportunities as the suburban student, learning a second language, comparing drafts of essays, and sharing ideas in a wiki. Principle number three: It is often the digital immigrant who knows where to look for the possibilities of the future.

In 1831, a young Frenchman came to America to study the penitentiary system. In his travels, he was able to discern what it was about American democracy that was worthwhile and noteworthy, interesting or even strange. The young tourist’s name was Alexis de Tocqueville, and he described for many Americans the culture they inhabited and even created but didn’t always fully understand. His book, Democracy in America (1835/2003), stands as a defining text for and of Americans more than 170 years after it was published. de Tocqueville was an observant tourist, an outsider, who brought his own experiences to bear on a new phenomenon. In addition to expanding what it means or what it might mean to be a digital immigrant, twenty-first century teachers might also become observant digital tourists. Riley, another teacher-to-be, suggested that one of her concerns is that not all her students will have access to the tools, but she would work to find ways for her students to learn via ICTs. Naomi and Riley, in particular, indicated that as teachers they would be more open to allowing students to propose means of using ICTs to meet course goals. New technologies will emerge even as others fade; thus, all thoughtful users of technologies will be digital tourists at varying times as new technologies open new possibilities.

**PRINCIPLE NUMBER FOUR:**

Digital tourists try out new technologies comparing the known and considering possibilities, through collaboration with peers and students, which might make the technology useful. Yet, the tourist has to make choices about what is worthwhile and what is not, what advances educational goals and what does not. Thoughtful tourists in the digital world incorporate the best of the experience into their thinking and instructional approaches. As you read this, a digital tourist somewhere is connecting students through a multi-user virtual environment to put students and community experts together across the continent. If you don't know what a MUVE is, you may recognize a popular form: Second Life (http://secondlife.com). After you surf there, consider the possibilities for your students in this environment. If you try it or even consider it, you're a digital tourist. Principle number four: Digital tourists try out and evaluate the educational uses of technology.

**Digital Tourists and Instructional Natives**

It is fun to call up a game on the screen; almost any digital native can do that. The teacher as digital tourist knows that educators must ask thoughtful questions about which games are useful and relevant. Is that game format the one that serves the needs of young learners who may be more interested in the fact that it is a game than what can be learned from it? Is there a more effective way? Why is this valuable? How does it connect people and ideas?

It is time to jettison the false choice of uninformed digital immigrant or savvy digital native; it is a limitation on our thinking. Two words of caution are in order, however. The digital immigrant/digital native metaphor casts the immigrant as an individual who can't quite think clearly about how technology might be used in service of learning. We believe the digital immigrant is still a useful way to think about learning and teaching in the twenty-first century if we can expand our thinking about our purposes for using technology in educational environments. Digital immigrants, like geographic
immigrants searching for a new life in a new country, offer richness and diversity to instruction in new times. Just as it is possible to oversimplify the immigrant metaphor, thus ignoring the contributions of immigrants to society, it is possible to oversimplify the notion of tourist. Many tourists fully engage with the communities and cultures with which they come in contact. Others only engage at the most superficial of levels. Like de Tocqueville, the effective digital tourist must engage with students and technologies in order to fully employ technology in pedagogically useful ways.

DIGITAL AMBASSADORS

Education is far too diverse an enterprise to be narrowed to one of two categories, immigrant or native; when our metaphors become clichés, it’s time to redefine them. We know that some tourists occasionally are not very thoughtful representatives as they explore. Therefore, digital tourists must be informed and precise in their use of technologies and those their students might use. In this way, we differ from Toledo (2007) who proposed that digital tourists might use technology only to the extent they must to survive in a digital world. In our metaphor, digital tourists try out and expand their knowledge through interacting with students and colleagues. As digital tourists become increasingly comfortable drawing on their expertise as instructional natives and the expertise of their students and colleagues they may, over time, become digital ambassadors, who know a great deal but are always open, like the most effective diplomat, to learning something new and listening carefully to the points-of-view of others.

As much today as in de Tocqueville’s time, teachers help students make use of the available tools that root them in the past, connect them in the present, and allow them to succeed in the future. Technology, thoughtfully applied, can promote useful associations and worthwhile innovations. Metaphors are useful in many ways, but the talent lies in knowing when to expand the attributes of the metaphor or to put it aside. Relevance is not found in following the evasive trends of technology. Digital natives need instructional natives who are willing digital tourists and ambassadors who advocate for technology that serves learning in meaningful ways.

REFERENCES


